

ELECTRICAL

INSTALLATION ENGINEER

NEWS LETTER

TAMILNADU ELECTRICAL INSTALLATION ENGINEERS' ASSOCIATION 'A' GRADE (Regn. No. 211/1992)

Old No.82 / New No. 123, Lloyds Enclave, Avvai Shanmugam Road, Royapettah, Chennai - 600 014.

Phone : 2811 1300 Email : tnagrade@gmail.com Website : www.teica.com

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EDITORIAL

Dear Members, Fellow Professionals, Friends and Well wishers,

Seasons Greetings To One And All!

Happy Engineers' Day!!

Hearty Welcome To The New Team Of Office Bearers Of Ineiea!!!

Celebration of Engineers' Day on the 15th of September is the Important Annual Event for all Engineers to reaffirm our commitment and contribution for the Nation Building and Progress. The Theme chosen for the year for the celebration is "**Skill Development for Young Engineers to Reform the Core Sector: Vision 2025**". The Theme tunes well with the Indian Mission for Skill Development as the important need of the hour to take Indian Economic Growth forward. A 'Write Up on the Engineers Day Theme' is published in this issue separately to bring out the dimensions of skills for the Profession and its Practice.

What Next? Is the important Question we should ask ourselves after we proudly published in the August Issue of these columns and rejoiced the fact that "In the area of Electricity, India will have a deficit free year in FY 2017 for the first time in its History". Focus on Efficiency is the answer for this question, as India still ranks very low in the efficient Distribution and Utilization of Electricity. We seem to be spending about 3 to 4 times more Electrical Energy per unit production of GDP in comparison with advanced countries like Japan, Europe and the US. It is therefore essential that we improve on '**Efficiencies**' to decrease the Demand for Energy and thus to reduce the demand for further increase in Generation Capacities. This can help reduce use of resources, Fossils or Renewables, and help save the Earth. The Skill Development theme discussed in the earlier part should not only focus on the important aspects of Safety but also on the other aspects like Perfect Workmanship and Efficiencies both in Design and Execution.

We celebrated Madras (Chennai) Day and Week during August when there were lot of talks and publications about the Great Heritage of our City. During September World Heritage Day and Tourism Days are celebrated and our Country as a whole can really feel proud about our Great Civilization, History and Heritage. There is tremendous scope for us to improve on Tourism and Revenues as we have naturally evolved Heritage Places due to our ancient Culture, Arts and Sculpture and Construction and great creations and long and eventful History of our Country.

We are Happy to place on record the Election of the following Office Bearers of the Association:

PRESIDENT - **Mr. S.D. Poongundran** (M/s Sudhan Power Tech)

SECRETARY - **Mr. S. Gopalakrishnan** (M/s Vinpower Engineers & Associates)

TREASURER - **Mr. M. Balamurugan** (M/s. Microtech Engineering Corporation)

We extend a Hearty Welcome to the New Team of Office Bearers of our Association and convey our Best Wishes for taking Association forward to Greater Heights.

We thank all those members who have helped us by participating in the advertisement appearing for the issue August 2016 – Elektrotec 2016, Anchor Electricals Pvt. Ltd., Electrician 2016, Galaxy Earthing Electrodes (P) Ltd., The Motwane Mfg. Co. Pvt. Ltd., Wilson Power and Distribution Technologies Pvt. Ltd., Pentagon Switchgear Pvt Ltd., Sun sine Solution Pvt. Ltd., Ashlok Safe Earthing Electrode Ltd., Fomra & Fomra, Universal Earthing Systems Pvt. Ltd., Dehn India Pvt. Ltd., Abirami Electricals, Supreme Power Equipment Pvt. Ltd., OBO Bettermann India Pvt. Ltd.

EDITOR

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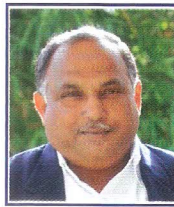
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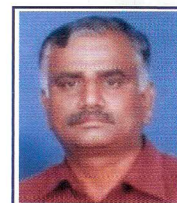
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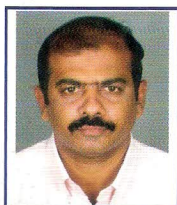
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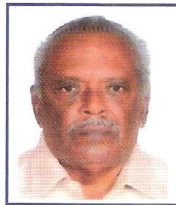
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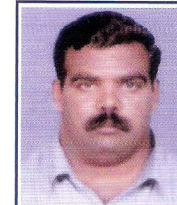
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N. Vasu
Vellore - 632 006.

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Sivasakthi Enterprises
Chennai - 600 116.



Mr. M. MANIGANDAN
Arma Engineers & Consultants
Coimbatore - 641 009.

EVENTS

L&T Training Programme

Selection of LV Switchgear and Applications	3 rd – 7 th October 2016
Breaker Maintenance Workshop – C – Power ACB	17th – 19th October 2016
Breaker Maintenance Workshop – U – Power Omega ACB	20th – 21st October 2016
Introduction to Industrial Electrical Systems	12th – 14th October 2016
Industrial Electrician Training Programme	24th – 25th October 2016
Electrician Training Programme for Residential Buildings	26th October 2016

Venue: L & T Ltd., Switchgear Training Centre, Nilgiris
Contact Tel.: 0423-2517107 **Fax:** 0423-2517158 **Email:** stc_coonoor@lntebg.com



Events Profile: Elektrotec 2016 is one of the largest electrical and industrial electronics sector trade events in India.

Date: 15th – 18th September 2016

Timings: 10.30 AM to 06.00 PM

Venue: CODISSIA TRADE FAIR COMPLEX, Avinashi Road, Coimbatore

Website: <http://elektrotec.codissia.com/>

ELECTRICIAN 2016 Trade Fair

Events Profile: Tamilnadu Electricians Welfare Association is working for the welfare & development of Electrical Workers working in the Non-formal Sector, with more than 20,000 members in 10 districts of Tamilnadu. The trade fair is open both to professional People and Public. The Visitor's Profile includes Members of our Association, Students from Engineering Colleges, Polytechnics and Industrial Training Institutes in Chennai City, Electrical Contractors in Chennai, Builders and Electrical Engineers in Chennai.

Date: 17th & 18th September 2016

Venue: Valluvar Kottam, Nungambakkam, Chennai

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



Events Profile: International Power, Electrical, & Electronics Expo. Powerelec India will feature Power Generation, Renewable Energy, Energy Transmission & Distribution, Power Electricals, Power Electronics & Automation as well as Lighting and Fixtures

Date: 24th – 26th October 2016

Venue: BCEC, Mumbai, India

Website: <http://www.powerelec.co.in/>

MEMBERS DETAILS

S.No.	Company Name	District	Contact No.	License No.
121.	R.V. Electricals	Chennai	044-22253025, 94441 52300	EA 2844
122.	Win Power Engineering	Chennai	044-23821818, 94440 76783	EA 2154
123.	A.K. Engineering Services	Chennai	044- 28261100, 94441 12269	EA 2258
124.	A.N. Power Engineering P. Ltd.	Chennai	044-28586801, 94440 13372	ESA 102
125.	Aabak Engineers	Chennai	044-43042329, 98417 20400	EA 2517
126.	ABB India Ltd.	Chennai	044-28291550, 97909 94025	ESA 232
127.	ARN Quick Electricals	Chennai	044-43181278, 98404 05917	ESA 361
128.	Batliboi Enxco (P) Ltd.	Chennai	044-42172094, 94453 93301	EA 2776
129.	Crown Electricals (Madras)	Chennai	044-24997417, 98410 25380	EA 1652
130.	Elco Engineering P. Ltd.	Chennai	044-24914738, 92821 16344	EA 1462
131.	Elneed Technologies Ltd.	Chennai	044-24491595, 94449 76737	EA 2045
132.	Essar Electricals	Chennai	044-43538542, 98406 28053	EA 2396
133.	Ganesh Electrical Contractor	Chennai	98415 85658, 98417 24262	EA 2756
134.	George Associates	Chennai	044-65375422, 98400 72836	EA 1999
135.	J.K. Engineering Associates	Chennai	044-24360053, 94444 05967	EA 2673



POWER LINKS

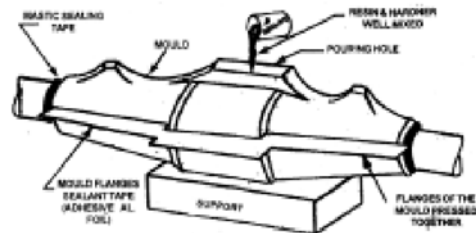
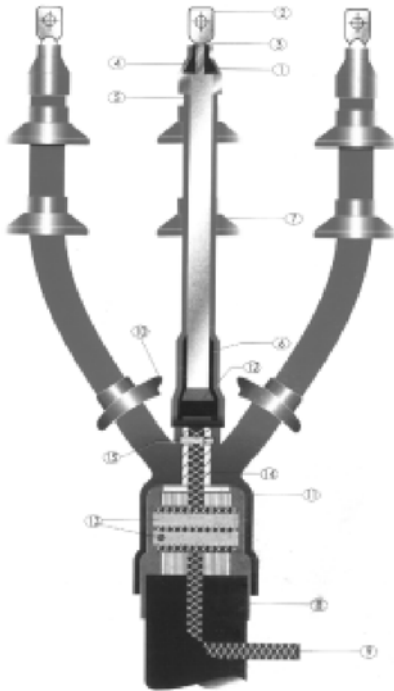
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49TH ENGINEERS DAY

Theme: Skill Development for Young Engineers to Reform the Core Sector: Vision 2025

September 15 is celebrated every year in the country as “**Engineers’ Day**” to commemorate the birthday of the legendary Engineer **Sir Mokshagundam Visvesvaraya**. Sir Visvesvaraya, an eminent Indian engineer and statesman was born in a remote village of Karnataka, the State that is incidentally now the Hi-tech State of the country. Due to his outstanding contribution to the society, Government of India conferred “**Bharat Ratna**” on this legend in the year **1955**. He was also called the precursor of economic planning in India. His learned discourse on economic planning in India, Planned Economy for India and Reconstructing India, was the first available document on the planning effort of the country and it is still held as the parent source matter for economic planners. A theme of national importance is chosen every year by the National Council of the Institution and deliberated at its various State/Local Centres to educate the engineering fraternity in general and the society in particular. This year the National Council of the Institution has selected the theme as “**Skill Development for Young Engineers to reform the Core Sector: Vision 2025**”.

There is immense pressure in restructuring global economy by means of global flow of goods, services and knowhow, when some industries decline as well as new avenue of opportunities is created. This force in turn creates the demand for re-skilling of those redundant workforce as well as skill-upgradation and training and development to promote new skills for those newly employed in new industries. Government across the states have taken some initiatives to address the major challenge of scaling up disparate skill development initiatives of different departments. Within a short span of time of less than ten years, a lot of skilled manpower is need to be developed, required by the market driven approach. The requirement of skilled manpower in all the major sectors of the country is not only a matter of national urgency, but also it is increasing in scale. However, Government of India has set a target to impart the necessary skills to 500 million people by the year 2022. The five sectors, which are identified with the expectation to create majority of employment are infrastructure, auto, building and construction, textiles and transportation. Now, like other employment sectors, shortage of required skills is one of the major constraints for the pass out engineering cadre for continuing growth of Indian economy. Different employer surveys addressed this knowledge gap and emphasize upon analysis and development of the classified skills for improved productivity.

In manufacturing, IT, infrastructure, power sector, engineers play a crucial role. In different real life situations, there arises unmet demand of skilled manpower. Different national and international bodies have carried out survey and analysis on this growing aspect of engineering fraternity and expressed concerns about the skills and knowledge at all level of workforce. As per the analysis of employer’s feedback, specific skills can be categorised as core employability skills, communication skills and professional skills and thus, a policy recommendation may drafted as follows.

1. Addressing the prime skill factors through assessments, teaching, curriculum, real life case study
2. Emphasize soft skills development
3. Exercise skills in simulated environment
4. Customize courses to meet different customer demand.



Compiled by
S. Mahadevan, B.E., F.I.E., M.B.A.,
Consultant,
Energy and Energy Efficiency,
Mobile: 98401 55209

Engineering, too, owes its most useful materials to the achievements of chemists in identifying, separating, and transforming materials: structural steel for the framework of bridges and buildings, portland cement for roadways and aqueducts, pure copper for the electrical industries, aluminum alloys for automobiles and airplanes, porcelain for spark plugs and electrical insulators. The triumphs of engineering skill rest on a chemical foundation. — HORACE G. DEMING

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KNOW THY POWER NETWORK - 108

This time we are going to have a new viewpoint or site in the “Power Network”. There is a big urge in me to share my ideas on ‘*Microgrid*’, the latest development in the modern Electricity Network. But the role of “**Storage Batteries**” in the present electrical world especially in the field of electrical vehicles and electricity storage force me to change my view and to opt for the topic titled “**Electrical Energy Storage**”, with a special focus on storage batteries.

In recent times, many advancements have been made in the field of Electrical Storage Batteries. Successful research has established that it is possible to produce on a large scale these batteries that last “**five times longer**” than the existing batteries. New materials are found out to expand battery capacity and its life as well. The new lithium air batteries have higher energy density at lower cost and it helps to allow an electric car to drive 640 km and a mobile phone to last for a week without recharging. The enactment of “**National Electric Mobility Mission Plan 2020**” envisages the huge demand for the storage batteries in the near future. All these cast a greater focus on “Storage Batteries”. On tasting all these in view, a new topic titled “**Storage Batteries and Electric Storage**” has been taken up for our study.

Before delving deep into this subject, let us have some interesting information. Presently as solar energy finds wide use, there is a big need for strategies to effectively store and dispatch the solar energy got from the sun depending on the customer load, weather system constraints and energy costs. Now flow batteries are found to be more useful in this regard. The general concept behind the modern flow battery is to plate zinc on a steel bar while charging and when discharging the flow is reversed taking the zinc back into the solution. The main active components are iron and zinc only and these are globally abundant and inexpensive. By stacking, these batteries we can get the desired voltage rating and energy as well.

A storage battery is a complex electro chemical device; it support protective systems to care expensive equipment like large generating units and transformers. In addition, they are useful in storing electrical energy when a need arises. These are also used to interchange energy with the grid. They provide a rapid response to the system need by charging and discharging the batteries. By this step they make the power system more flexible and help to save the costly wind power generation. This type of battery storage scheme acts a constant voltage in the power system. Thus they act as a interface between the grid and the wind mill generators.

I. Need of Batteries

You may be eager to know why and where batteries are needed / used. *Battery is an essential and critical equipment whose presence is needed in so many areas / places and it is nearly impossible to list them all.* Some of its applications are listed below as an illustration.

- i. Electric generating stations and substations for the operation of protection networks and control of relays and switches.
 - Telephone systems to support phone service particularly the emergency services.
 - Industrial application for protection and control
 - Backup of computers that deal with financial data and information
 - Loss critical business systems
 - A source of electricity during emergencies and power failure periods (Inverter)
 - A useful medium for Electricity Storage in the net work consisting of wind electric generators and solar PV cells
 - A main emergency backup systems for hospitals.

It is now time for you to see how electricity plays an important role in our daily lives and how important is the role played by batteries in keeping this essential electricity network “in tact”. Without batteries, many of the back services we now enjoy and take for granted would fail and bring insurmountable problems. Many blackouts that had occurred in 2003 and 2012 may be taken as real life examples.

II. Battery Types

There are many types of battery technologies and subtypes. Among them, significant are,

- Lead acid
- Flooded (wet) type – Lead – Calcium – Lead – Antimony

- Valve regulated – Lead - acid; sealed type
- Absorbed Glass Mat (AGM)
- Gel
- Flow type
- Flat plate
- Tubular plate

III. Battery Construction and Normen Culture

A battery has several interlinked components; a jar or container to hold everything and a cover, an electrolyte (sulphuric acid or potassium hydroxide solution or any other electrolyte), negative and positive plates, top connections all like polarity plates together and then posts that are also connected to the top connections of the like polarity plates. In a battery the positive plate is the working plate; if a negative plate is not placed on the outside of the last positive plate, the whole outside of the last positive plate will not have anything to react and produce electricity. Hence one more negative plate is always added in all batteries as a result all batteries have an odd number of plates. To cite an example, a 100AH 33 battery consists of 33 plates; out of this, 16 plates are +ve in nature and the rest (17 plates) are –ve in nature. Each positive plate is rated at 100AH. Multiply 16 by 100 and the capacity at 8 hour rate is found to be 1600AH.

With batteries having higher capacities, there may be four or six posts. This helps to avoid the over heating of the current carrying components of the battery during high current drawal or time consuming lengthy discharges. A lead-acid battery has a series of plates connected to top lead connected to posts. If the top lead, posts and inter cell connectors are not of the required size. (large enough to safely carry the electrons), then over heating caused by I^2R loss may occur and bring damages to the battery components, at time accompanied with smoke / fire. Further to prevent plates from having inadvertent contact with each other separators are provided.

(To be continued...)

Let me sign off here
Kindly stay tuned.



*V. Sankaranarayanan, B.E., FIE,
Former Addl. Chief Engineer/TNEB
E-mail: vsn_4617@rediffmail.com
Mobile:98402 07703*

THE MULTI-CITY TOUR OF DANFOSS DRIVES ENERGY EFFICIENCY YATRA

Danfoss India has highlighted the need for energy efficient interventions in a state like Tamil Nadu, which is heavily driven by industries and currently projected for robust growth. Mr. Ravichandran Purushothaman, President, Danfoss India, elaborated and said that while TN has been able to overcome the power crisis, given the growth trajectory, there is bound to be demand for more energy and that energy efficiency will become a major contributing factor for India's economy and will be the key to sustainability.

Although driven largely by the textile industry, TN also has other industries like vehicle manufacturing, vehicle parts manufacturing, electronics, mining and energy, which collectively contribute to the rising energy demand. Currently, with almost non-existent regulations for motor standardization, the industrial sector in the country is witnessing an increase in energy intensity, weighing more on the rising energy demand.

With the need for energy constantly on the rise, it has been encouraging to note that the government has been actively introducing schemes like PAT (Perform, Achieve and Trade) to enhance cost effectiveness of improvements in energy efficiency in energy intensive large industries and facilities like aluminium, cement, chlor-alkali, fertilizers, iron and steel pulp and paper, textiles and thermal power plants.

The multi-city tour of Danfoss Drives Energy Efficiency Yatra aims to empower industries to adopt brand new innovations in energy efficient technology. The bus, which will cover 11000 kms, was flagged off in Delhi and has already covered Punjab, West Bengal, Odisha, Jharkhand and Hyderabad.

We shall see more in the next issue.....

Source Url:

<http://www.energetica-india.net/news/danfoss-highlights-energy-efficient-interventions-can-save-upto-1500-mw-per-day->

RES TO SUPPLY BATTERY STORAGE SOLUTIONS TO THE UK GRID

Renewable Energy Systems worked in tandem with Great Britain's National Grid to create battery energy systems that can provide sub-second frequency response services. Energy storage and smart grids have been touted as the future for national energy infrastructures, and the U.K. is now set to test out Renewable Energy Systems' (RES) new energy storage



systems to provide frequency response. RES has been working with the National Grid to create the systems, which are expected to be fully operational in 18 months.

The battery energy storage systems developed by RES can provide a frequency response service in less than a second, making it the first in the country to have a sub-second timescale. The service is aimed at balancing the grid when energy is in high demand, and RES has said that it will be fully operational within 18 months.

"This is the first time that battery storage will be used to provide such fast-acting frequency response service to the National Transmission Network in Great Britain," said Adam Sims, Senior Account Manager at National Grid. "This innovative technology will enable us to respond to frequency issues in under a second, helping to maintain the integrity of the grid."

RES has been working with the National Grid for the last two years to develop the systems, and has now signed a four year contract to provide 20 MW of frequency response from its battery storage systems.

The potential role of energy storage in the U.K.

Energy industry eyes will be on the progress of this project, as energy storage, and the benefits that it could bring to a carbon-free economy, becomes a hot topic in the U.K. Earlier this year, the U.K.'s National Infrastructure Commission released a report that argued the U.K. could save GBP 8 billion (US\$11.7 billion) by adopting a smarter energy policy, which includes electricity storage and demand flexibility.

"Energy storage can play a large role in supporting the U.K.'s transition to a secure, low carbon, low cost energy system," said John Prendergast, Energy Storage Manager at RES. "We believe that this contract will play an important role in demonstrating this and will encourage policy makers and regulators to accelerate the removal of barriers to wider deployment of energy storage in the U.K."

"This service and the forthcoming Enhanced Frequency Response service will support the network as we transition to a generation mix with greater levels of low cost renewable energy," added Sims.

Adopting energy storage systems into national energy systems can also benefit the consumers, by reducing electricity costs throughout the grid. Similar initiatives have been incorporated in other countries, with RES alone commissioning six similar projects in North America.

"RES has previously pioneered the delivery of very fast frequency services in Canada and is one of the largest providers of such services in the USA," said Prendergast. "Now, developing this innovative service with National Grid is a major step in the development of RES' U.K. energy storage business."

Read more: http://www.pv-magazine.com/news/details/beitrag/res-to-supply-battery-storage-solutions-to-the-uk-grid_100024721/#ixzz4BNZyEYEI

A leader or a man of action in a crisis almost always acts subconsciously and then thinks of the reasons for his action. – JAWAHARLAL NEHRU

NEW ELECTRICITY TARIFF POLICY TIGHTENS REGULATOR'S ROLE

The Ministry of Power is empowered to prepare the tariff policy, which may be revised from time to time for the development of the power sector and for the optimal utilization of natural resources. The first Tariff Policy was notified by the Central Government under Section 3 of the Electricity Act, 2003 on 6th January, 2006 and the same was amended on 31st March, 2008, 20th January, 2011 and 8th July, 2011. The Govt. of India has now notified new tariff policy on 28th January, 2016. For the first time a holistic view of the power sector has been taken and comprehensive amendments have been made in the Tariff Policy 2016. The amendments are aimed at achieving the objectives of UDAY (Ujwal Discom Assurance Yojana) with a focus on Electricity for all, Efficiency to ensure affordable tariffs, Environment for a sustainable future and Ease of doing business to attract investments and ensure financial viability. The new Tariff Policy tightens the discretion currently allowed to regulators while setting power tariffs and makes a strong pitch for the promotion of clean energy. New tariff policy will also support Swachh Bharat programme, better regulations and encourage faster roll out of investments in the power sector.

The Electricity Act 2003, requires the Central Electricity Regulatory Commission (CERC) and State Electricity Regulatory Commissions (SERCs) shall necessarily be guided by the tariff policy in discharging their functions including framing the regulations under section 61 of the Act. The new tariff policy tightens the norms followed by electricity regulators for setting terms and conditions for determination of tariffs. After the amendments, it would be binding on the regulators to take decisions as per the new tariff policy.

The policy has allows increase in fuel cost on account of import to be included in the tariff structure. In case of reduced quantity of coal supplied by Coal Companies, vis-a-vis the assured quantity of 85 per cent, the higher cost of imported or market based e-auction coal for making up the shortfall, shall be considered for being made a pass through by the regulators on a case-to case basis, to the extent of shortfall, according to an amendment to the policy. Generators, however, have been given the freedom to sell surplus power in spot market if the beneficiary does not give prior notice two days ahead. It was earlier 10 hours. The policy also specifies norms for ancillary services. The central commission has been given the right to introduce the norms and framework for ancillary service necessary to support the power system or grid operation for maintaining power quality, reliability and security of the grid, including the method of sharing the charges.

The new tariff policy also look to strengthen regulatory mechanism so that discoms become more efficient and conscious towards their duties to consumers. It indicating that the new tariff policy is focus on clean energy, and have a challenge to add 1.75 Lakh MW of renewable energy, GOI bringing certain more elements in tariff policy which will promote renewable energy. It also includes the elements, which will promote Swachh Bharat Abhiyan and help waste to energy, prosper in India. Under the policy, the power plants will have to use processed municipal waste water available in their vicinity (in 100 km radius). It will allow distribution companies to buy any amount of power produced from the waste. The new policy reflect a concern to environment and encourage renewable energy. It will also help India's energy security by planning in advance for the requirements for tomorrow. Several unique aspects which have not been touched in the past are being brought out in this policy. The new tariff policy will give a big push to electricity generated from renewable energy sources and address concerns related to the environment.

The government in new Tariff Policy increases the Renewable Purchase Obligation (RPO) to 8% for solar energy by March 2022. Distribution Companies are mandated to purchase a certain amount of their energy from renewable sources under the RPO. Then, the amendment on having eight per cent of the total electricity consumption from solar energy by March 2022 will remain a mere goal unless it is enforced by the States. While the existing Electricity Act too mandates renewable energy purchase obligations (RPOs), it is up to the respective SERCs to decide on the quantum and also whether or not they should be legally binding. Similarly, implementation of periodic tariff revisions as mentioned under the new Tariff Policy is dependent on SERCs introducing orders to such effect. Raising the RPO is a necessity, and the single most important regulatory and policy mechanism of government of India to drive solar.

Under another part of the policy, new coal or lignite-based thermal plants will also have to establish, procure or purchase renewable capacity as part of the Renewable Generation Obligation (RGO). For the power sector as a whole, the new tariff revision aims to help the government's Ujwal Discom Assurance Yojana (UDAY), a major upheaval of policy around the country's heavily debt-laden Discoms. Although UDAY is not mandatory,

the majority of states have signed up to the scheme since it was announced. The new tariff policy permitting power companies to pass-through changes in domestic duties, cess and taxes to customers through tariff hikes. In the past, the CERC has held the view that changes in such costs come under 'changes in law' and can therefore be allowed to be recovered through tariff hikes but many SERCs have not followed this approach for their respective States. The policy is making an attempt at giving guidance on this.

The new power Tariff Policy incorporates changes that would well for the power sector in the long run. While some are intended at improving power supply, others aim at helping power companies recover costs. Then, there are amendments that are targeted at promoting renewable energy. But, while the changes are positive, they are not legally binding as the policy serves largely as a guiding force. Moreover, the actual implementation has to be undertaken by the State governments and the respective State Electricity Regulatory Commissions (SERCs). Electricity for all practical purposes is a State subject. The entire success depends on the extent to which the State governments adopt the changes and follow them. In fact, some amendments such as those relating to competitive bidding for inter-State transmission projects and renewable energy purchase obligations (RPOs) are not completely new. The implementation record on these has however been patchy. The provision in the new Tariff Policy on procurement of power from smaller plants that use poor- quality coal (coal rejects generated from washeries) should aid power supply in the areas located close to the mines. Allowing private power producers to expand their capacity by up to 100 per cent at their existing sites too is a good move. This should help them better utilise the available land and do away with acquiring additional land, to a certain extent.

Improving competition across categories of power projects

Tariff-based competitive bidding for transmission projects was introduced a few years ago, some projects have continued to stay outside this mechanism. Under the existing rules, the Centre can allot projects which are technologically complex or require urgent implementation to Power Grid Corporation of India, the country's principal power transmission company. The amendments to the new Policy now make competitive bidding compulsory even for the central public sector projects. However, coal washery rejects based projects have been exempted from such competitive bidding process until the Government of India decides to introduce competitive bidding process for such projects.

In addition, as per the amendments to the Policy, State Government owned generation and transmission companies shall continue to operate power projects based on 'regulated cost plus tariff regime' as per Section 62 of the Electricity Act, 2003 for sale or transmission of power within that particular state. The amendments to the Policy also provide that state transmission utilities must endeavour implement larger projects on the basis of competitive bidding. The amendment in the new Tariff Policy is on similar lines. According to it, tariff-based competitive bidding can be done away with in case of exigencies. The new policy therefore has not been able to make the process completely competitive.

Promotion of renewable sources of energy

Promotion of renewable sources of energy has been expressly provided as an objective of the Policy. Also, the term 'non-conventional energy' has been replaced with 'renewable energy'. The Renewable Purchase Obligations will be updated on long- term basis by the Ministry of Power, in consultation with the Ministry of New and Renewable Energy (MNRE) and in keeping with the targets provided under the National Action Plan on Climate Change (NAPCC). The State Electricity Regulatory Commissions will prescribe minimum percentages of purchase of solar energy till generated solar power reaches at least 8% in total energy terms. Tariffs will be determined on 'cost plus basis', for the procurement of power from all waste-to-energy plants.

A framework for technology based Renewable Energy Certificates (REC) and a suitable 'REC Multiplier' to differentiate between technologies shall be adopted. A separate bid based tariff framework for generation of renewable energy, imposing progressively heavier charges towards the end of the term, will be introduced. Generating companies establishing coal/lignite based thermal stations shall be required to establish a renewable energy generating station mandatorily for at least 10% of the generating capacity of such coal/lignite thermal power station.

Regulator's Role and Way forward Distribution

The cross subsidy surcharge formula has been revised to balance interest of open access consumers and DISCOMs. Besides, Commission has been given flexibility to review it. Apart from this, Railways may be exempted from Cross Subsidy surcharge in consultation with State Government.

Provision for usage of Smart meters in a phased manner to enable "Time of Day" metering, reduce theft and allow net-metering.

In order to reduce burden on consumers, it is provide to ensure recovery of regulatory assets in a time bound manner within 7 years against the existing provision of 3 years.

Periodic (monthly/quarterly) revision of tariff allowed to reduce the burden on consumer. The Regulator to notify fuel price/power purchase adjustment formula for recovery of cost on monthly/quarterly basis. With regard to the rate of depreciation for distribution, Forum of Regulators is empower to suggest appropriate depreciation rate.

The Appropriate Commission is required to consider distribution and supply margin on the basis of allowing returns on distribution. FOR is empower to carry out study on price cap regulation for distribution and supply margin.

The State Regulatory Commission will devise a specific trajectory so that 24 hours supply of adequate and uninterrupted power can be ensured to all categories of consumers by 2021-22 or earlier depending upon the prevailing situation in the State.

To enable to provide power in remote unconnected villages through micro grids and provide continuity of power supply, regulator to mandate compulsory purchase of power into grid from such micro grids at regulated tariff.

Forum of Regulators to evolve model guidelines on operating norms for distribution network. Operating norms for distribution network would be notified by the state Regulators accordingly.

The Regulators are required to introduced differential rates of fixed charges for peak and off-peak hours for better management of load, within a period of two years. SERC's are also required to make mandatory load forecasting by distribution licensees along with their power procurement plan. Two-part tariffs featuring separate fixed and variable charges and time differentiated tariff introduced for large consumers of 1 MW and above within one year and subsequently for all consumers within a period of five years. This would also help in flattening the peak and implementing various energy conservation measures. Regulators are required to notify mandating installation of smart meters for consumers of more than 500 units before December, 2017 and consumers more than 200 units before December, 2019. Energy audit of distribution network also required to make mandatory.

Transmission

India is running one of the largest renewable capacity expansion programmes in the world and there is a need for corresponding grid stability. Regulator will frame norms for ancillary services to support power system or grid operation especially with expanding renewable energy.

Long term planning in transmission to further strengthen the grid and allow seamless flow of power across regions all over India and keep power rates low.

Intra-State Transmission projects shall be developed by State Government through competitive bidding process for projects costing above a threshold limit, which shall be decided by the State Regulator. Inter State transmission projects to be developed through competitive bidding with flexibility to meet exigencies.

The sharing of the transmission charges, tariff determination and conformity with minimum standards of performance shall be as per the National Tariff Policy. The mechanism for competitive bidding is proposed to be exempt for certain projects SERC's are required to notify framework for intra-state transmission pricing based on distance, direction and quantum of flow on lines based on the framework evolved by the Central Commission. SERC's are also required to prescribe methodology for loss allocation in intra-state transmission system.

Generation

Generate employment in coal rich Eastern states by encouraging investments. States may allow setting up of Generating plants including from Renewable sources, and up to 35% of its power, may be procured by Distribution Companies on regulated tariff basis.

Remove taxation ambiguity by allowing cost pass through of change in domestic duties, levies, cess and taxes in competitive bid projects. Developer shall have the option to indicate the rate of depreciation subject to upper ceiling decided by the Commission.

Clarity on tariff setting authority for multi-State sales. Central Regulator to determine tariff for composite scheme where more than 10% power is sold outside the State.

Cost pass through for imported coal/e-auction coal for competitively bid power projects for making up the shortfall in the event of the coal company failure to supply assured quantity of coal.

Reduce cost of power generation through expansion of existing power plants by utilizing its land and other available facilities. Allow utilization of surplus assets in order to decrease overall power cost. The regulators are required to suitably amend the tariff regulations.

Allowing benefit from sale of un-requisitioned power to be shared on 50:50 basis between parties to the PPA, if not already provided for in the PPA.

Affordable power for people near coal mines by enabling procurement of power from coal washery reject based plants. Regulator is required to frame regulations accordingly.

The Central Commission would, in consultation with the Central Electricity Authority, notify operating norms from time to time for generation and transmission. The State Regulators would adopt these norms or fix relaxed norms based on the actual performance.

To release clean water to meet drinking water needs of cities and reduce pollution of rivers, it will be mandatory for thermal plants within 50 km of sewage treatment facilities to use treated sewage water. In order to promote the higher efficiency level of old generating units, the regulators are required to incorporate provision under regulation for allowing Renovation and Modernization before completing the useful life of the projects.

The Regulator is required to notify methodology for sale/purchase of Un Requisitioned Surplus Power.

In view of geological uncertainties and clearance issues faced by Hydro projects and also to promote clean power, Hydro projects have been exempted from competitive bidding till 15th August 2022.

Allow availability of cheap hydro power by enabling DISCOM to extend PPA by 15 years beyond the current 35 years, subject to approval of the regulator. Regulators are also required include the suitable provision for determination of tariff for Pumped Storage Plant.

The Regulatory Commission shall provide for suitable regulatory framework for incentivizing the developers of Hydro Electric Projects (HEPs) for using long-term financial instruments in order to reduce the tariff burden in the initial years.

Renewable Energy

Renewable Power Obligations (RPO): In order to promote renewable energy and energy security, the 8% of total consumption of electricity, excluding hydro power, shall be from solar energy by March 2022.

Renewable Generation Obligation (RGO) - New coal/lignite based thermal plants after specified date to also establish/procure/purchase renewable capacity as prescribed by Government of India.

Central Regulator is required to provide Technology and vintage based REC multipliers. The Renewable energy tariff regulations to provide for area/zone wise CUF. The tariff for renewable sources determined by CERC to act as ceiling tariff in this regard.

To allow bundling of renewable power with power from thermal plants whose PPAs have expired or plants which have completed their useful life. The appropriate Commission is required to notify regulations for bundling of Renewable Power along with power from such old plants. Such renewable power shall account for towards RPO obligation of obligated entities.

The Regulators are required to make a framework for compulsorily procurement of 100% power produced from all the Waste-to- Energy plants in the State by the Distribution Companies. This will facilitate meeting the objective of Swachh Bharat Mission for disposal of waste besides generation of electricity.

The Central Regulator not to levy inter-state transmission charges and losses on transmission of solar/ wind power through inter-state transmission system.

Conclusion

Consumer interest is best served in ensuring viability and sustainability of the entire value chain viz., generation, transmission and distribution of electricity, while at the same time facilitating power supply at reasonable rate to consumers. The new tariff policy included several provisions to achieve this objective. The Appropriate Government as well as the Appropriate Commission while implementing such provisions shall ensure viability of the generation, transmission and distribution in terms of recovery of all prudent costs. The Regulators are required to notify regulations for recovery of all prudent costs pertaining to generation, transmission and distribution. The Regulators are also required to strengthen himself and capacity building of its officers to give the fruitful results of new tariff policy.

Courtesy: Mr Ashok Upadhyay

*BE (Electrical), M.Tech. Hon. (Ind. Engg.), M. Phil (Renewable Energy),
PHD Scholar Dy. Director (Generation), M.P Electricity Regulatory Commission, Bhopal (MP)
Ieema Journal, March 2016*

THE NEXT, BIG SMART OPPORTUNITY

In the city of Eindhoven in the Netherlands, lighting giant Philips has built one of the world's largest city farming research facility which grows thousands of vegetables, herbs and strawberries in multi-level racks fitted with state-of-the-art technology

The 234 square metres Grow Wise Center, which opened last July, is developing the perfect blueprint for growing food for city dwellers all year round using sustainable and efficient techniques. Their “LED light recipes” which involve shining blue and red lights, among others, at crops encourage faster growth and greater yields without the use of pesticides.

It also helps save resources: Where it would take 60 litres of water to produce one kilo of tomatoes in, say, a typical greenhouse production facility in Spain, the same amount of tomatoes will only require five litres of water at the GrowWise farm.

Mayor of Eindhoven, Rob van Gijzel, regards this technology – which integrates lighting, climate control, software controls, sensors and logistics in one harmonious solution - as just one of the ways smart city applications will revolutionise global food, energy, and water systems in the coming years.

It also exemplifies how some businesses are leading the way by reinventing their offerings - in this case, going from manufacturing lights into food production - for an increasingly smart world.

“You can have it here in Singapore, or in any city. With just a couple of huge buildings, you can

produce a lot of food. It's really breakthrough, and this is probably the most disruptive technology that will be available within ten years,” said Mayor van Gijzel at the sidelines of a business seminar on smart cities hosted by the Dutch Chamber of Commerce Singapore (DutchCham) last month (30 March).

Eindhoven, like many cities across the world, is in the global race to develop the smart technologies that will redefine the way people work, live and play.

In 2011, the Eindhoven region was named the world's Most Intelligent Community of the Year by the Intelligent Community Forum, thanks to its focus on high-value, technology-based products and public-private partnerships on innovation.

Mayor van Gijzel said that this was possible, firstly, because the government invested into the infrastructure.

Homes and companies were all connected with broadband Internet, but he emphasised that it was not enough. The city's smart technologies were successful because they had its people at its heart. This enables large scale interest and participation from citizens, he noted.

“It was all about inclusivity, and that's very important. Otherwise, it's not a smart community,” he says.

Singapore has similar ambitions to become the world's leading smart city. In 2014, it unveiled a ‘**Smart Nation**’ vision that involves billions of dollars in investments over the coming years into smart technologies that promise to improve daily life for citizens and deliver greater energy efficiency.



SOLAR NOW INDIA'S FASTEST – GROWING NEW ENERGY SOURCE, SAYS MERCOM

Report forecasts India to install around 5 GW of new solar capacity this year, and reveals a bulging solar pipeline that has surpassed 22 GW.

India's bold solar ambitions – to reach 100 GW of installed PV capacity by 2022 – may still seem a little far-fetched, but recent market analysis by Mercom Capital Group has revealed that the country is giving it its best shot at reaching those goals.

According to the latest Mercom India update, the country has so far installed 2.2 GW of new solar capacity this year to date, putting it on course to reach 5 GW for the calendar year and, in the process, making solar India's fastest-growing new energy source.

Mercom also calculates that in May this year the country's cumulative solar capacity surpassed 7.5 GW, while a further 22 GW is in the pipeline – around 13 GW of which is under construction, with the remaining 9 GW going through the Request for Proposal (RfP) process.

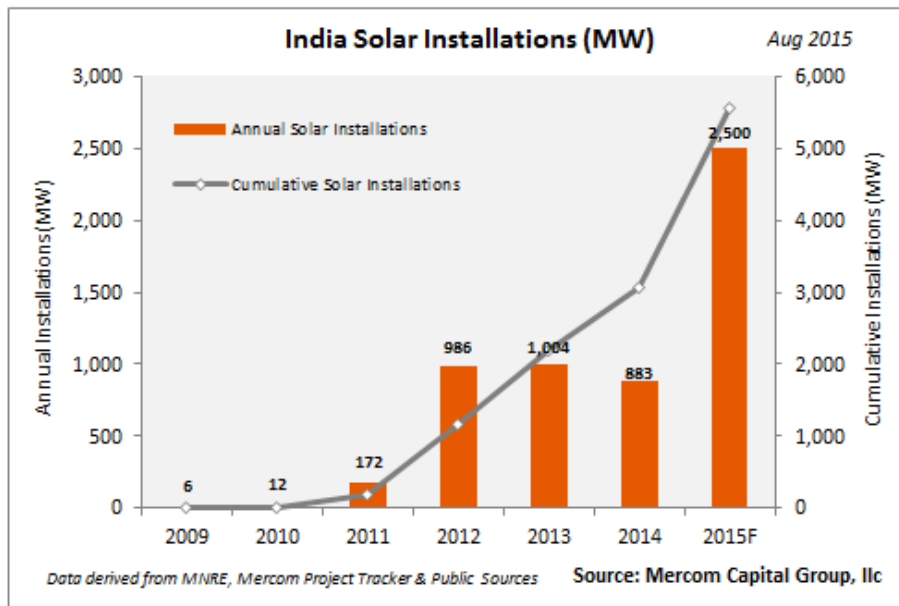
Projections for next year are even more bullish, with Mercom expecting India to install more than 9 GW of new PV capacity in 2017, reaching close to 20 GW of cumulative installations in the process. This acceleration is borne out by the figures – in the fiscal year 2015-16, solar represented 2.5% of India's net installed capacity, which was a

1.4% increase in the space of one year, making it the country's fastest-growing energy source.

Renewables in general account for 14% of India's installed power capacity mix. Wind remains the dominant renewable source, but solar – at 17% of the country's installed renewable capacity – is closing that gap rapidly.

“The Indian solar market is growing in size, but the question is: is it too much, too fast?” Asked Mercom Capital CEO Raj Prabhu. With infrastructure and systems unable to keep pace with auction announcements, and the market shifting rapidly from a 2 GW-a-year one to a 10 GW-a-year one, there is still much work to be done, Prabhu says.

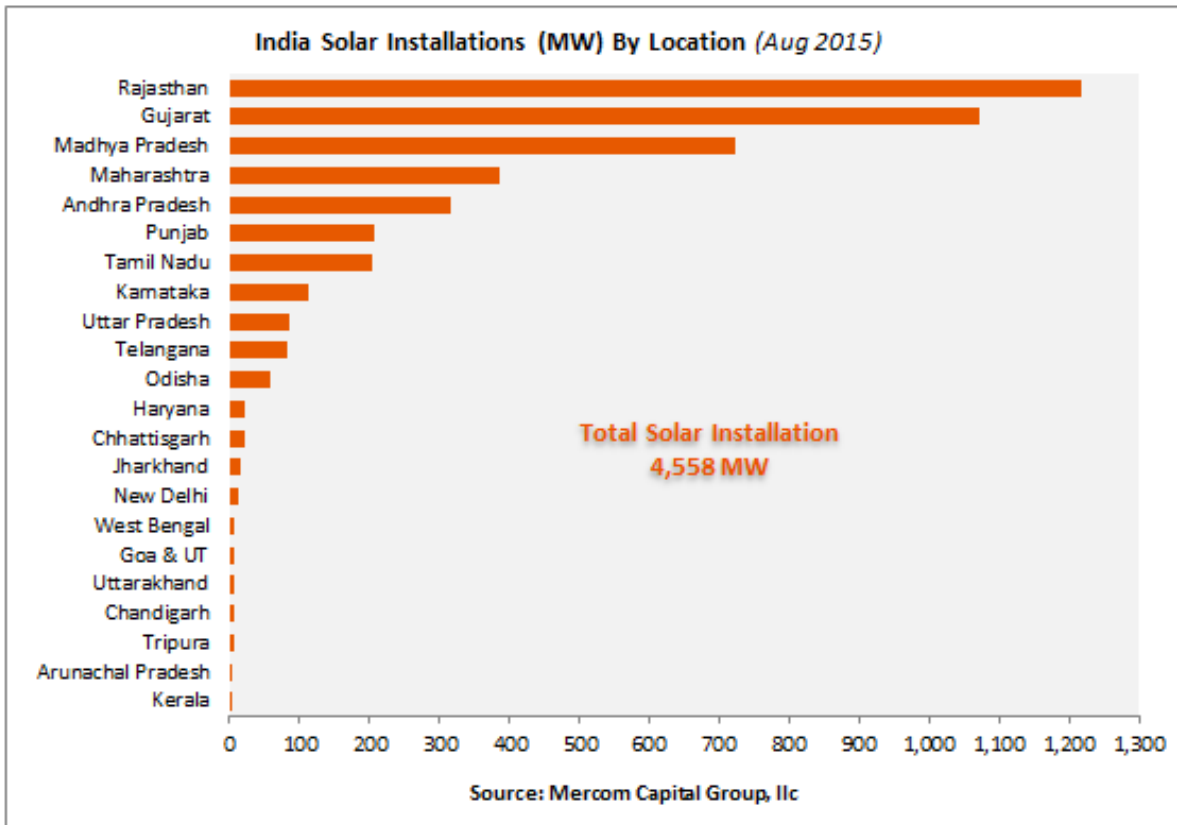
The issue is low bidding levels through reverse auctions. Currently, 19 developers have bid for 2.9 GW of solar projects below Rs. 5 (approximately \$0.0735/kWh), and of this total around 1-2 GW have signed power purchase agreements (PPAs). With India's banking sector facing difficulties, some developers could find it tough to finance projects at this rate.



Utility-Scale Solar Projects in India	
Operational and Under Development	
Aug 2015	
	Capacity (MW)
In-Operation	
Solar PV	4,349
Solar Thermal	209
Total	4,558
Under Development	
Solar PV	7,505
Solar Thermal	280
Total	7,785

Source: Mercom Capital Group, llc

Prabhu adds, however, that the lowest tariff set at auction – \$0.0638/kWh – appears to be an outlier, with all subsequent auctions coming in at \$0.0685/kWh or above.



“There is no set rule which says tariffs below Rs.5 (~\$0.0735) cannot be financed. Some banks are seriously looking at projects in the Rs.4.5-5 (~\$0.0662-0.0735) tariff range, but financing depends on sound project economics, borrower credibility, a strong balance sheet and the developer’s ability to service debt,” he said.

About Mercom

Through a unique blend of research, market intelligence and effective communication services, Mercom Capital Group gives its clients the edge they need to succeed in today’s competitive market place. Mercom is a thought leader and highly respected for its in-depth knowledge in cleantech and healthcare information technology market places. Mercom’s consulting division is the leader in delivering timely relevant market intelligence and research reports for cleantech and healthcare information technology industries. Through our consulting services, we provide companies the tools and know-how to make sound decisions, stay ahead of the market and penetrate new markets. Mercom maintains one of the largest databases of solar, smart grid and wind companies around the world, giving Mercom and its clients unprecedented reach and insight into their industry.

Mercom’s Market Intelligence Reports have become industry essentials delivering timely industry happenings and ahead-of-the-curve analysis which enable industry executives and followers to be continually in the loop. Our Market Intelligence Reports are the ultimate one-stop resource utilized to develop strategy, perform research, influence decisions, identify funding opportunities, monitor deal flow, keep up to date on regulatory matters or just to keep up with market events.

Mercom’s market intelligence is followed by top solar, smart grid, wind and healthcare IT companies and organizations around the world. Our subscribers include c-level executives and decision makers from public and private companies, industry associations, investment banks, venture firms, private equity groups, government agencies, policy groups, educational institutions and more.

Our market intelligence reports cover two important emerging areas of technology: clean energy and healthcare information technology.

Read more: http://www.pv-magazine.com/news/details/beitrag/solar-now-indias-fastest-growing-new-energy-source—says-mercom_100024864/#ixzz4BNYwXVyL

ANNUAL GENERAL BODY MEETING

Date: 20.08.2016, Saturday

PLACE: VGP Golden Beach Resort, Injambakkam

MINUTES OF MEETING

The Annual General Body Meeting started with a Welcome Note by **Mr. U. Baskaran**, President.

Mr. P. Suyambu, Treasurer submitted the audited accounts for the years 2014-2015 & 2015-2016 and circulated copies of audited accounts. All members gave their consent. The Audited accounts passed unanimously thereafter.

Mr. K. Kannan Secretary briefed members about the performance of the Association between 2014-2016. To mention a few,

1. Regular monthly meetings were conducted.
2. Achieved improved attendance in monthly meetings.
3. Regular communications were maintained with all members through e-mail.
4. All efforts are being taken to obtain TDS refund, which is due to Association.
6. The monthly rental income from its assets, has been enhanced in accordance to the market value.
7. The fixed deposits have been increased in past 2 years.
8. Improved realization of subscription arrears, from the members, has been achieved due to Treasurer's efforts.
9. Association Website has been updated regularly.
10. Newsletter distribution streamlined.
11. Secretary extended his special appreciation to **Mr. B. Paalanikumar, Vice President & Mr. M. Balamurugan, Committee Member for the efforts taken for promoting the New Year Diary 2016.** This effort had given a financial gain to the Association.
12. Better Interaction with CEIG office.
13. All efforts are taken for extending the Licence period from the present period of 2 years to 4 years.
14. New Technical Guideline Book has been released by CEIG on March 2015.

The election to Office Bearers of the association for the years 2016-2018 was conducted.

There were 3 nominations for President post 1. Mr. U. Baskaran, 2. Mr. S.D. Poongundran, Mr. R. Ramachandran

There were 2 nominations for Secretary Post 1. Mr. B. Paalanikumar, 2. Mr. S. Gopalakrishnan.

There were 2 nominations for Treasurer Post 1. Mr. J. John, 2. Mr. M. Balamurugan.

The following were Declared as Elected Office Bearers for the year 2016 – 2018.

Joint Secretary	-	Mr. S. Karthikeya Pandiyan, M/s. Siva Sakthi Enterprises
President	-	Mr. S.D. Poongundran, M/s. Sudhan Power Tech
Secretary	-	Mr. S.Gopalakrishnan, M/s. Vinpower Engineers and Associates
Treasurer	-	Mr. M. Balamurugan, M/s. Microtech Engineering Corporation

The following members were selected for Joint Secretary.

Joint Secretary	-	Mr. S. Karthikeya Pandiyan, M/s. Siva Sakthi Enterprises
		Mr. M. Manikandan, M/s. Arma Engineers & Consultants

It was decided to revamp the VP zones and Members gave their concurrence for the same.

The following members were selected for VPs for respective regions.

VP Chennai	-	Mr. K. Buththan, M/s. Sakthi Electrical Traders
VP Vellore	-	Mr. N. Vasu, M/s. N. Vasu
VP Cuddalore	-	Mr. R. Muralidharan, M/s. Electro Tech Engineers
VP Salem	-	Mr. S. Manivannan, M/s. Mani Engineering
VP Tiruchi	-	Mr. S. Kalyana Venkatraman, M/s. Sundhar Electricals Pvt. Ltd.
VP Coimbatore	-	Mr. G. Kannan, M/s. S.E. Consultancy & Services
VP Madurai	-	Mr. S. Ponnambalanathan, M/s. Ramani Engineering
VP Tirunelveli	-	Mr. J. John, M/s. Gopi Electricals

Meeting ended with a Vote of Thanks by Mr. S. Gopalakrishnan, Secretary.

The AGM concluded with a Good Dinner in VGP Golden Beach Resort, Injambakkam.

ANNUAL GENERAL BODY MEETING - PHOTOS



President Welcoming Members



Members Gathering



Members Gathering



Members Gathering



Members Gathering



Secretary Mr. K. Kannan briefs steps taken during 2014-2016



Passing of Accounts



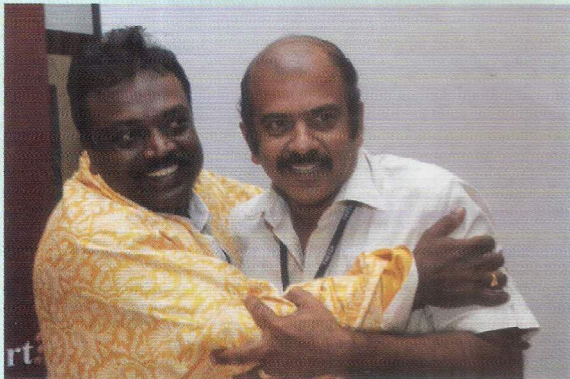
Election Committee



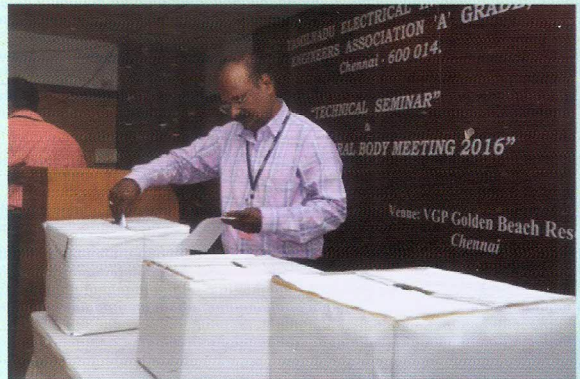
Felicitating President



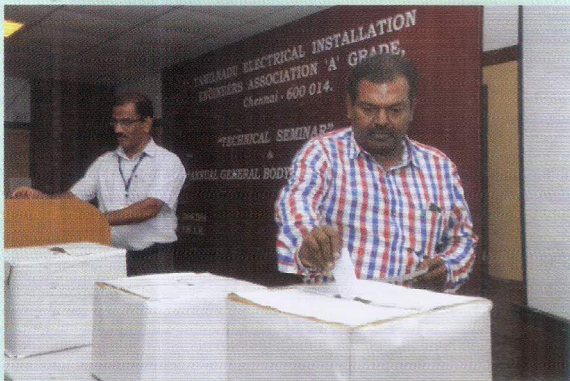
Felicitating Secretary



Felicitating Treasurer



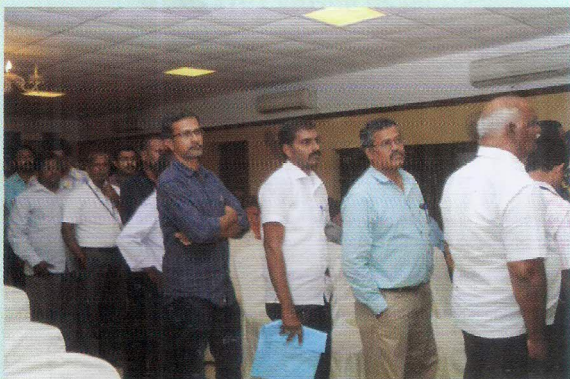
Voting in Progress



Voting in Progress



Representatives watching the voting process

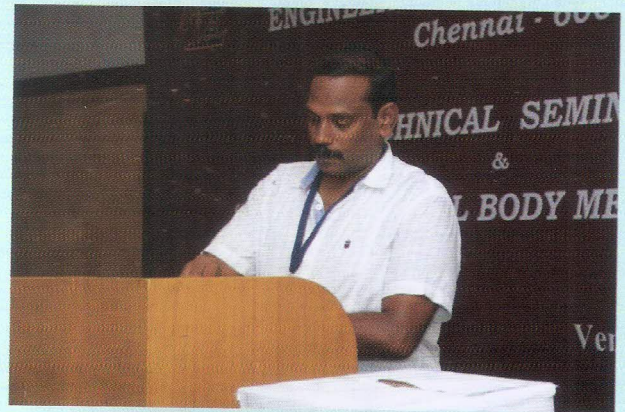
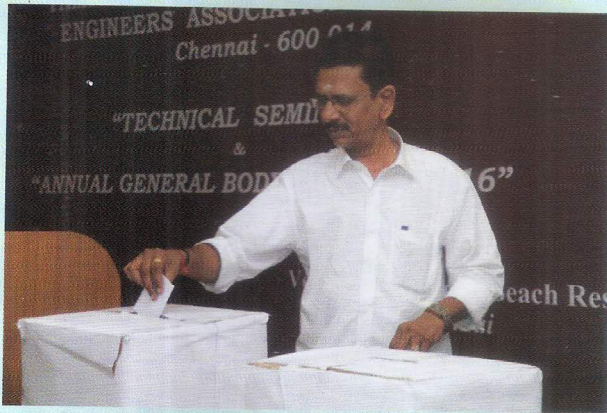
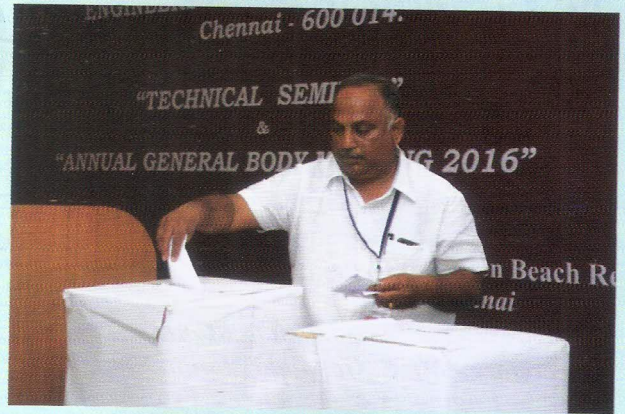


Enthusiasm to vote

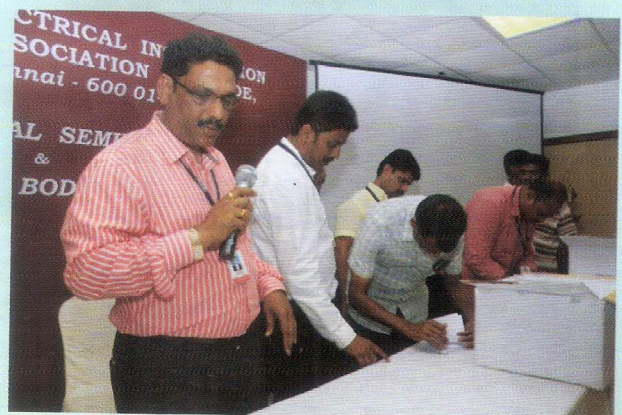
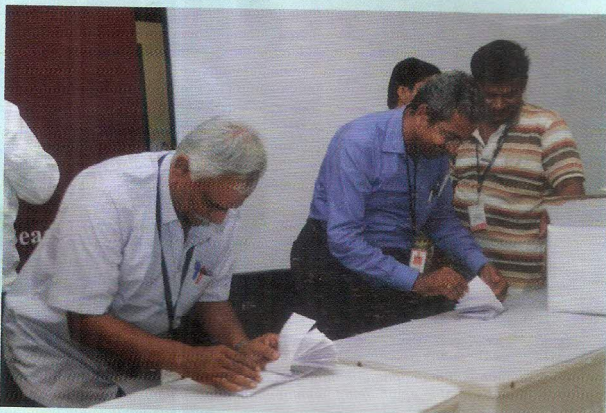


Enthusiasm to vote

VOTING IN PROGRESS

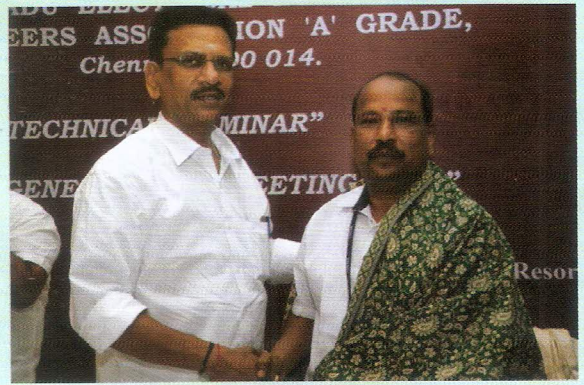


COUNTING OF VOTES





*New Team - Left to Right -
Secretary - Mr. S. Gopalakrishnan, Vinpower
Engineers & Associates, Erode;
President - Mr. S.D. Poongundran, Sudhan
Power Tech, Cuddalore;
Treasurer - Mr. M. Balamurugan, Microtech
Engineering Corporation, Chennai*



*Congratulating
New President Mr. S.D. Poongundran
by Past President Mr. U. Baskaran*



*Congratulating
New Secretary Mr. S. Gopalakrishnan
by Past Secretary Mr. K. Kannan*



*Congratulating
New Treasurer Mr. M. Balamurugan
by Past Treasurer Mr. P. Suyambu*



Thanking Election Committee and its team

ARCHITECTONICS

Active solar technologies need to be understood and considered at the beginning of programming and conceptual design stages.

The UN COP21 Paris Climate Conference reported buildings globally use a third of all energy and are responsible for a fifth of energy related greenhouse gas pollution; and for the first time “Buildings Day” was on the official schedule. Durable buildings, landscaping, and planning designs can exist for over 100 years, and architecture and urban designs without active solar energy technologies delay a wider post fossil fuel reformation and learning-curve. Passive design and efficiency advances alone may be misleading if structural changes to buildings and site planning patterns for active solar renewable energy are ignored. The opportunity for incremental development toward post fossil fuel sustainability is blocked by continued development of fossil fuel dependent forms.

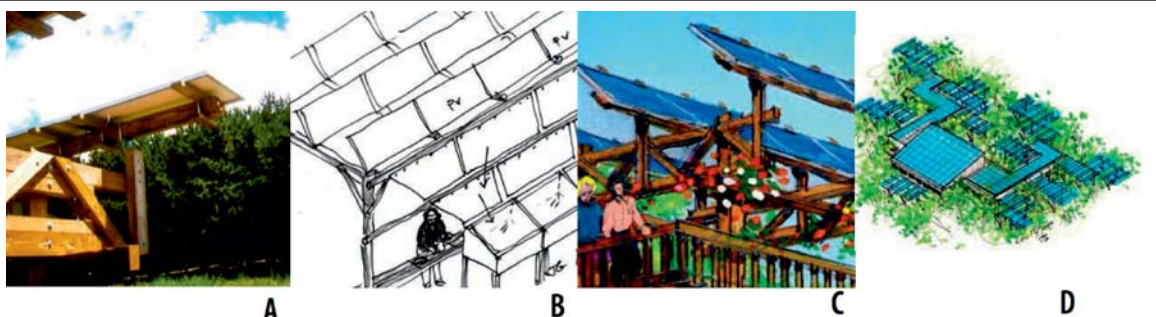


Fig. 1- PV PERGOLAS: A-Wood PVOLT 2004 demonstration at Custer, Wisconsin; B-PV above deck up near the treetops; CPV pergolas in adjacent gardens; D-PV pergola with reflector augmented solar cookers.

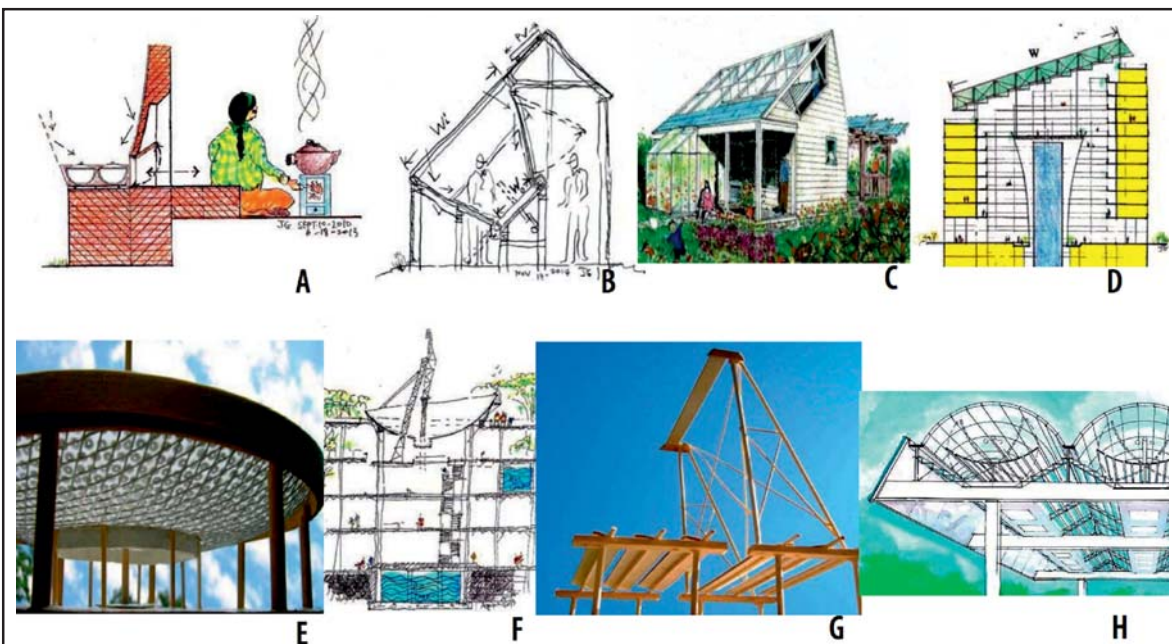


Fig. 2- Solar Concentrating and Storage Architectonics (SCSA): A- Exterior building size CPC reflector thru kitchen-wall solar cooker; B-BIETR small test facility; C-BIETR house size demonstration building; D-BIETR atrium hotel; E- Small heliostats on long-span hanging roof with daylighting model; F-Solar bowl on water tank foundation; G-Linear Fresnel above roof deck; H-Interior 1-axis tracking troughs roof with daylighting.

Buildings and cities have only so much area for solar collectors and on-site renewable energy technologies. Active solar technologies need to be understood and considered at the beginning of programming and conceptual design stages. Large arrays of active solar collectors and large solar energy storages are substantial design elements which are structure and form generating influences. Aims for these studies are to search for aesthetic

collector and storage architectural schematics, and to stimulate interest for inclusion in architectural and engineering education curriculums.

Presented is a selected summary outline of architectural research projects and studies in three groups: PV Pergolas; Solar Concentrating and Storage Architectonics (SCSA); and Architectural Reuse of Wind Blades.

PV Pergolas

PV pergolas are a way to increase on-site solar PV areas above open air semishaded green spaces for people adjacent to buildings and on rooftops. PV above decks up near the treetops is a way to add PV with deck additions in urban areas with mature trees. Early 2000 studies surveying ways to integrate PV pergolas in the built environment were followed by the design and installation of a one-axis (horizontal) tracking demonstration using standard sizes of milled treated wood. Tracking PV for small PV pergola areas is not advisable, and standard size tracking horizontal wood beams are too bulky, were learned from this experience. Recent studies combine a fixed PV pergola structure and augmenting solar cookers with anodized aluminum reflector facets secured to horizontal poles attached to two sun-facing pergola columns, semi-shading the cooks.

Solar Concentrating and Storage Architectonics (SCSA)

SCSA studies have been schematic architectonic explorations with most all of the reflector concentrator configurations integrated with structure/form for global regions and many building types and sizes. Building integrated (BI) studies include: fixed nonimaging (NI) CPC-type troughs exterior and interior (BIETR); two-axis tracking small heliostats with central receiver; one-axis tracking long-span linear Fresnel heliostat reflectors with linear receivers; spherical segment imaging fixed reflector bowl with two-axis tracking linear receiver; Interior tracking collectors; storage tanks; and combinations of collectors and storage.

Architectural Reuse of Wind Blades

The growing wind power industry has many large fiberglass hollow blades with a life-cycle of about 20 years. Exploratory architectural schematic design studies began to consider used wind turbine blades (34m/112ft-70m/230ft long) as building structural members, beams and columns, indicating loadings and supports required for structural engineering evaluations. Studies have included: towers and signposts; PV colonnade; PV pergolas; inclined long span PV roofs; row houses roof; radiating blade plans supporting small two-axis tracking heliostats with elevated receivers on reused towers; an openair theatre with radiating blades supporting a fabric roof; and a ship with radiating blades supporting solar collectors. Just as every building structure of any significance requires signed verification by professional engineers and architects, used wind blades with cracks and fatigue defects, modified for structural building applications would need similar responsible procedures. Since wind blades are used for only about 20 years, but possible as reused blade building structure members for 50-100 years more, it may be worthwhile to add design features in the original fabrication for the extended long-term use.

Courtesy : Solar Today

SIEMENS AND GAMESA TO MERGE SIEMENS' WIND POWER BUSINESS TO CREATE A LEADING GLOBAL WIND POWER PLAYER

Siemens and Gamesa have announced that they have signed binding agreements to merge Siemens' wind power business, including wind services, with Gamesa to create a leading global wind power player. Siemens will receive newly issued shares of the combined company and will hold 59 percent of the share capital while Gamesa's existing shareholders will hold 41 percent. As part of the merger, Siemens will fund a cash payment of €3.75 per share, which will be distributed to Gamesa's shareholders (excluding Siemens) immediately following the completion of the merger (net of any).

Additionally, Gamesa and Areva have entered into contractual agreements whereby Areva waives existing contractual restrictions in Gamesa's and Areva's offshore wind joint venture Adwen, simplifying the merger between Gamesa and Siemens. As part of these agreements, Gamesa – in alignment with Siemens – grants Areva a put option for Areva's 50 percent stake and a call option for Gamesa's 50 percent stake in Adwen. Both options expire in three months. Alternatively, Areva can in this time divest 100 percent of Adwen to a third party via a drag-along right for Gamesa's stake.

The new company, which will be consolidated in Siemens' financial statements, is expected to have on a pro forma basis (last twelve months as of March 2016) a 69 GW installed base worldwide, an order backlog of around €20 billion, revenue of €9.3 billion and an adjusted EBIT of €839 million. The combined company will have its legal domicile and global headquarters in Spain and will remain listed in Spain. The onshore headquarters will be located in Spain, while the offshore headquarters will reside in Hamburg, Germany, and Vejle, Denmark. The two businesses are highly complementary in terms of global footprint, existing product portfolios and technologies. The combined business will have a global reach across all important regions, and manufacturing footprints in all continents. Siemens' wind power business has a strong foothold in North America and Northern Europe, and Gamesa is well positioned in fast-growing emerging markets, such as India and Latin America, and in Southern Europe. Further, the transaction will result in a product offering covering all wind classes and addressing all key market segments to better serve our customer's needs. "The merger with Siemens constitutes recognition for the work performed by the company in recent years and performed by the



company in recent years and evidences our commitment to generating value in the long term by creating significant synergies and extending the horizon of our profitable growth. Today, we are embarking on a new era, creating, alongside Siemens, a world-leading wind player. We will continue to work as before, albeit as part of a stronger company and with an enhanced ability to offer all of our customers end-to-end solutions," said Ignacio Martín, Executive Chairman and CEO of Gamesa.

"The combination of our wind business with Gamesa follows a clear and compelling industrial logic in an attractive growth industry, in which scale is a key to making renewable energy more cost-effective. With this business combination, we can provide even greater opportunities to the customers and value to the shareholders of the new company. The combined business will fit right into our Siemens Vision 2020 and underlines our commitment to affordable, reliable and sustainable energy supply," said Joe Kaeser, President and CEO of Siemens AG.

Siemens and Gamesa expect significant synergy potentials in a combined setup. In total, annual EBIT synergies of €230 million are expected in year four post closing. "As a leading wind power player, especially in emerging markets, Gamesa is a perfect partner for us. Teaming up will enable Siemens and Gamesa to offer a much broader range of products, services and solutions to meet customer requirements. The move will put Siemens and Gamesa in the best position to shape the industry for lower cost of renewable energy to the consumers," said Lisa Davis, member of the Managing Board of Siemens AG.

The envisaged combination is unanimously supported by Gamesa's Board of Directors and Siemens' Supervisory Board. Iberdrola has entered into a shareholders' agreement with Siemens and will hold around 8 percent in the combined company after closing of the transaction. The transaction is subject to approval by Gamesa's shareholders and to other customary conditions such as merger control clearances and the confirmation by the Spanish stock market regulator (CNMV) that no mandatory takeover bid has to be launched by Siemens following completion of the merger. Supervision of the merger process has been entrusted by Gamesa to a Merger Committee created ad hoc, which will be made up exclusively of independent directors. Closing is expected in the first quarter of calendar year 2017.

LITHIUM-SULFUR BATTERIES OVERCOME ANOTHER LIMITATION: HIGH TEMPERATURES

Lithium-sulfur (Li-S) batteries have been pursued as an alternative to lithium-ion (Li-ion) batteries for powering electric vehicles due to their ability to hold up to four times as much energy per unit mass as Li-ion. However, Li-S batteries don't come without some problems. For instance, the sulfur in the electrode can become depleted after just a few charge-discharge cycles, or polysulfides can pass through the cathode and foul the electrolyte.

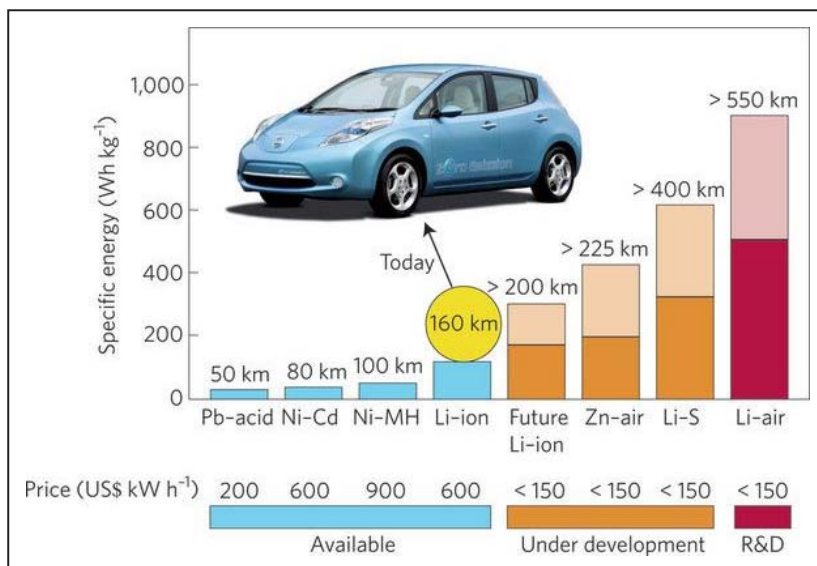
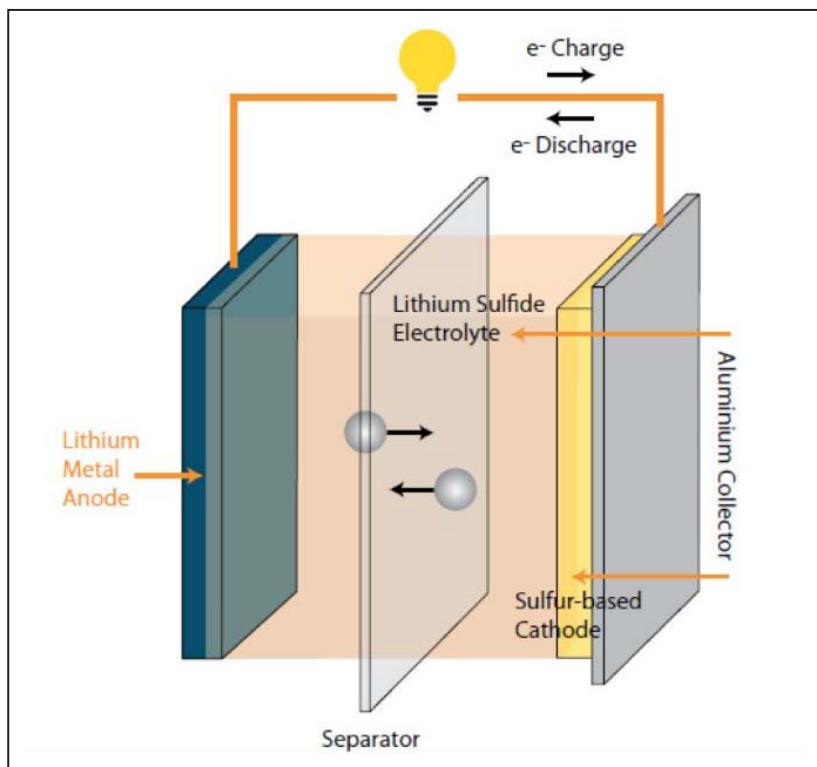
Another issue Li-S batteries face is the difficulty of ensuring that they operate safely at high temperatures due to their low boiling and flash temperatures. Now, researchers at the University of Western Ontario, in collaboration with a team from the Canadian Light Source, have leveraged a relatively new coating technique dubbed molecular layer deposition (MLD) that promises to lead to safe and durable high-temperature Li-S batteries.

This MLD technique is essentially an adaptation of the conventional atomic layer deposition (ALD) techniques that have been used to deposit thin inorganic oxide films. Where MLD departs from its predecessor is that it can incorporate organic components into the films, making it possible to create hybrid organic-inorganic thin films. MLD is a technique that has proven itself applicable for use in energy storage systems; it provides a high level of control over film thickness and the chemical composition of the target material at a molecular scale.

In research described in the journal *Nano Letters*, the Canadian researchers were able to fabricate safe, high-temperature Li-S batteries on universal carbon-sulfur electrodes using an MLD alucone coating

“We demonstrated that MLD alucone coating offers a safe and versatile approach toward lithium-sulfur batteries at elevated temperature,” said Andy Xueliang Sun, who led the research at the University of Western Ontario, in a press release.

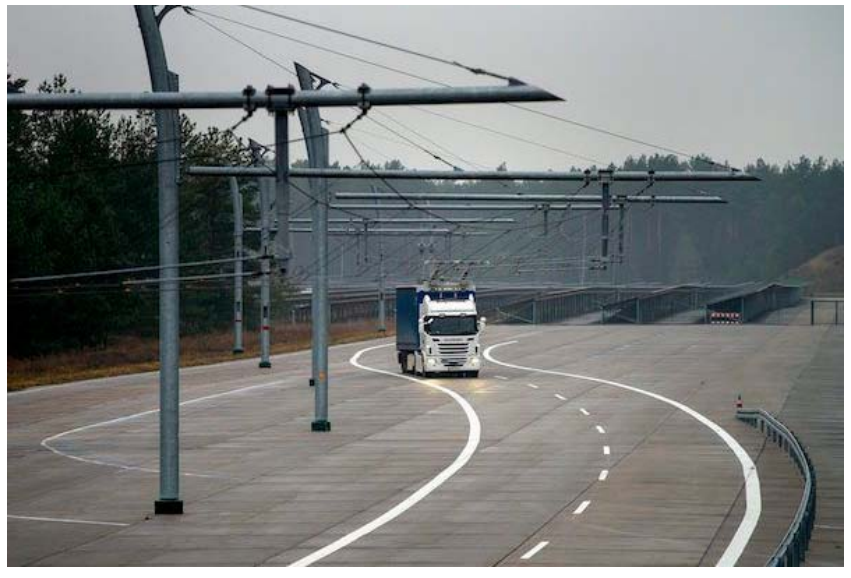
In the experiments, the researchers demonstrated that the MLD alucone coated carbon-sulfur electrodes remained stable and even showed improved performance at temperatures as high as 55 degrees Celsius. The researchers expect that these performance figures should significantly prolong battery life for high-temperature Li-S batteries.



*Come out into the universe of Light. Everything in the universe is yours,
stretch out your arms and embrace it with love.
If you every felt you wanted to do that, you have felt God. - SWAMI VIVEKANANDA*

SWEDEN TESTS ELECTRIC ROADS TO GIVE EVS UNLIMITED RANGE

Renewables are critical to the future of efficient, clean transportation. For road vehicles, storing those renewables, and then using them only when necessary, is still a major obstacle to commercial success. In Sweden, the government is partnering with the private sector to deploy new technology that could allow electric vehicles to travel on roads indefinitely, without having to worry about lengthy recharging or massive battery packs. Is it fusion power? Dark matter? Black magic? Nope: overhead wiring.



Sweden's latest foray into roads that can provide electric power to vehicles is perhaps one of the least futuristic options possible, but that doesn't necessarily make it any less effective.

A two-kilometer pilot stretch of the E16 motorway has been equipped with overhead catenary wires, and trucks modified with pantographs are running tests to see how well works.

Power delivery systems like these are nothing new: They've been around since the 1880s, and we still use them all over the place. In crowded city centers, overhead wires are the safest way to provide power to buses and trolleys following fixed routes, and they're also the only way to keep high speed intercity trains fed. Vehicles that run on rails harvest electricity from a single overhead wire, using their tracks to complete the circuit. Buses and other vehicles with tires need a pair of overhead wires instead, and this is the kind of system that Sweden has set up.

The overhead wires provide 750 volts of direct current to the hybrid electric system in the truck through a pair of pantographs. The pantographs can automatically deploy and attach to the wire while the vehicle is travelling at speeds of up to 90 kilometers per hour, meaning that the truck can seamlessly enter and exit a roadway. The truck itself is a hybrid electric, with a 360 horsepower motor that runs on both biofuel and a 5-kilowatt-hour lithium battery pack that provides enough juice to go about three kilometers. That battery storage capacity isn't much, but it's easily enough for getting on and off electrified roadways whenever necessary—especially with the biofuel engine as a backup.

This sounds like a great compromise, but before you get your hopes up, it's not likely that this will happen with your average sedan or light truck. The height required for a safe overhead line (between five and six meters) would render the connection system impractically long for passenger vehicles.

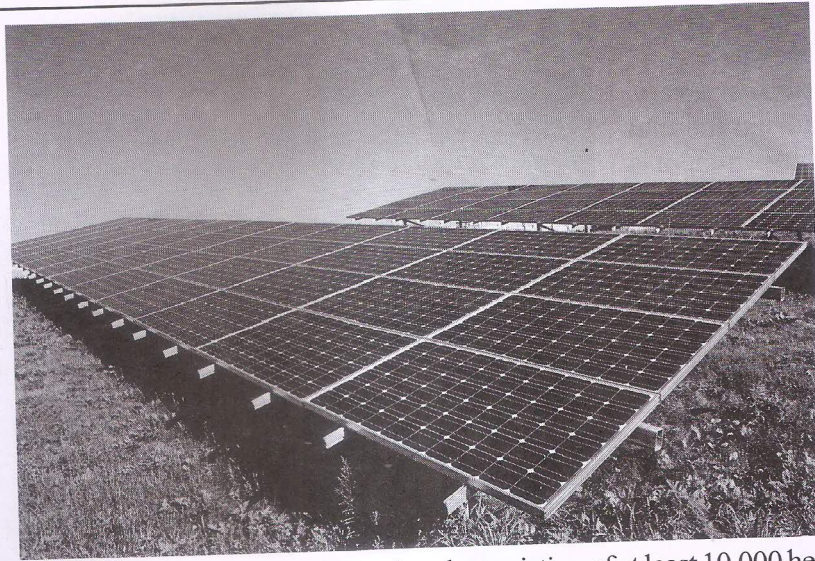
Sweden is also testing a different type of electric road, using conductive transfer technology based on an energized rail embedded in the road surface. The rail is exposed, and special "shoes" underneath vehicles can draw energy from it continuously. The rail is only energized when a vehicle passes over it, and "multiple safety barriers" are in place to minimize the risk of accidental zaps.

Systems like these make sense in the same kinds of situations and locations where you might consider running a freight rail line, except that using trucks on roads instead of trains on rails has a lower cost of entry and is much more flexible. It's also easier to implement on a wider scale, since trucks don't have to fundamentally change their behaviour to benefit. They can follow the same routes at the same times with the same payloads. The only exception: For what is hopefully a significant portion of the trip, they'll be emission free.

These roads will be undergoing testing through 2018. The Swedish government hopes that it will learn enough about what works and what doesn't to help it make informed infrastructure decisions, with the goal of a completely fossil fuel-free vehicle fleet by 2030.

IEEE Spectrum

INDIA SANCTIONS PLANS FOR 10 'SOLAR ZONES' OF AT LEAST 10,000 HECTARES EACH



India has sanctioned plans to implement 10 'Solar Zones' each consisting of at least 10,000 hectares of land to encourage solar PV project developers, manufacturers and investors to help achieve the country's massive 100GW by 2022 solar targets.

The unprecedented scheme, which will run for five years from 2016/17 to 2020/21 using government or privately-owned wasteland, uncultivable land or fallow land, will receive INR440 million (US\$6.5 million) of Central government funding. The zones will be able to cover more than one patch of land at a time. To count as a solar zone, it must be possible to install transmission systems in an economically feasible manner on site.

The difference between Solar Zones and Solar Parks is that the Government will only facilitate the purchase of land for the zones, but will not actually acquire it. Furthermore, instead of having transmission provided, solar zones will have several interconnection points set up in a manner that prevents any developer from having to build a line for more than 25 kilometres. A letter to the Ministry of the New and Renewable Energy (MNRE) from Devendra Singh, under secretary to the government, explained that the zones will help individual states reach their Renewable Purchase Obligations (RPO), which is a mandate for them to purchase a certain percentage of their energy mix from renewable sources. The zones will also drive investment and employment with an aim to decrease reliance on expensive conventional power plants.

Solar Energy Corporation of India (SECI) will develop the zones in collaboration with state governments and their agencies. All states are eligible to benefit from the scheme.

State government's wishing to participate must identify land with insolation of more than 4kWh/sqm and commission a techno-economic feasibility report.

The letter explained the value of keeping solar projects in close proximity to avoid the added costs of smaller, spread-out systems in terms of site development, transmission losses, extra transmission infrastructure and procurement of water among other expenses.

The land will be able to demonstrate synergies with other technologies such as wind and solar hybrids. Indicative allocations of the land were provided, but they are subject to change:

- 25% for manufacturers of ingots, wafers, cells and modules as part of the 'Make in India' scheme.
- 25% for small and medium enterprises, farmers and unemployed youth
- 50% for solar project developers

Just yesterday, PV Tech reported India's plans to double its solar parks policy to hit 40GW capacity by 2020 in response to its slow-moving rooftop sector and concerns over SunEdison's capacity, which is currently in limbo following the company's bankruptcy three months ago.

MNRE first announced plans to bring in Solar Zones last November along with major plans for floating PV.

ENERGY CONSERVATION THROUGH ENERGY EFFICIENCY – 18

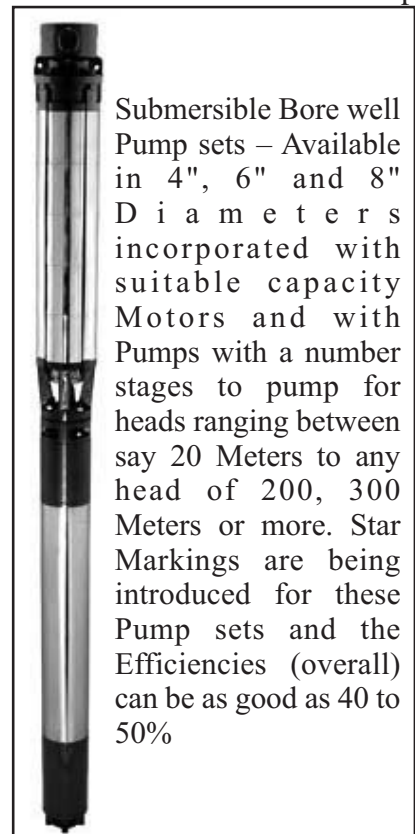
Energy Conservation through ‘Overall’ Efficiency Improvement of Motor Driven Systems

Basics re visited:

- Major portion of almost 80% of Electrical Energy is used through Motor Driven Systems.
- The overall or end use efficiency is decided by the combination of Efficiencies of the Motors, Driven Equipments, Controls and other things like mechanical transmission, friction and other losses.
- Motor driven pumping solutions form a large bulk of the Motor driven systems and considering the present day situation of very large usages in Agriculture, Domestic, Municipal and Rural Water supply installations etc, apart from considerable usages in Process Industries, Buildings and Air conditioning etc, the usage of Electricity by pumping applications can easily be put at about 50% of the total Electrical Energy. “**Watergy**” meaning Energy consumed in water pumping operations is also considered as a distinct area of Energy Consumption.
- Application of Drives to control the Motor Speeds to control the outputs is very much on the increase in large Industries, but still the scope is still large. As we saw, only this approach to control the outputs can contribute to considerable Energy Savings. In case of small, medium and micro industries, which could account for a considerable percentage of Motors usage, Drives have still to make significant entry almost from nil stage.
- In case of pumping applications, particularly in uses other than in large Industries, there is a lot to be desired in terms of overall efficiencies of equipments which are used. There is also another important problem to be identified for these segments that based on the Technology or the Type of Solution chosen for the application, the overall efficiencies suffer very badly.
- In terms of Technologies and Solutions, let us look at situations where the suction requirements far exceed the 7 to 8 Meters suction limits of Centrifugal Pumps and these are common in cases of Deep Bore wells or Deep Open wells, where water levels could be at 10 to 50 Meters or more from Ground level. The Solution choice could either be a “**Submersible Pump**”, where the suction head is almost zero and the entire head is only ‘**Delivery Head**’, or a “**Surface Mounted**” Compressor or Jet Pumps with technologies to take care of the extra suction head requirements. Surface or Ground level mounted solutions are generally chosen partly due to initial costs and mostly due to the fear of failure or burn out of Motors etc, as the whole pumpset will be under water in case of submersible pumpsets.
- In case of Submersible Pumsets, care needs to be taken to see that the Motors are manufactured with special technologies and materials suitable for working under water and care also needs to be taken to provide sleeves and screens etc to prevent sand entry into the pump. The Bores of adequate Diameters have also to be drilled with care to see that they are straight and with uniform diameter throughout. The scope for saving Energy is substantial when submersible solutions are chosen.

Case Studies:

The following case studies are chosen to compare performances and Energy Consumption levels between Submersible and Surface mounted Pump sets. In the case studies presented below, tests are carried out in the same bore wells, replacing the Pumps and pipes in the same bore well.



Case Study 1:

Water to be pumped from a Bore well where water is available at 150 Ft. to a overhead Tank of 2000 Litres Capacity located at 40 Ft above ground level (total head of pumping 190 Ft).

A Jet Pump was first employed for the pumping. The details of Type, Capacity and the measurement of Energy consumed details are as below:

Jet Pump

- HP of Pumpset: 2HP
- Head pumped: 150' + 40'
- Energy consumed for pumping 2000 Ltrs = 4.10 units

In the same bore, the Jet Pump was replaced with a Submersible Pump with piping etc suitably changed Submersible Pump

4" Oil Filled Type

HP of pumpset - 1.25HP 12 stage

Head pumped 150' + 40'

Energy consumed for pumping 2000 Ltrs = 0.9 units

Energy Saved is 3.20 Units or 77% per pumping

Case Study 2:

Water to be pumped from a Bore well to a Tank of 2000 Litres Capacity on a total head of 175 Ft.

A Compressor Pump was first employed for the pumping. The details of Type, Capacity and the measurement of Energy consumed details are as below:

Compressor Pump

- HP of motor 2HP
- HP of compressor 1.5HP
- Head pumped 175'
- Energy consumed for pumping 2000 Ltrs = 1.80 units

In the same bore, the Compressor Pump was replaced with a Submersible Pump with piping etc suitably changed Submersible Pump

4" Oil Filled Type

HP of pumpset - 1.25HP 12 stage

Head pumped 175'

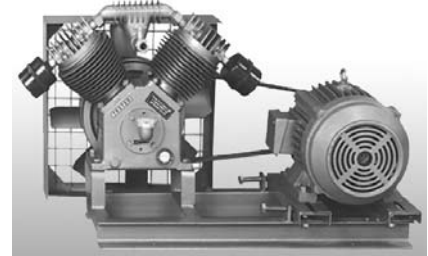
Energy consumed for pumping 2000 Ltrs = 0.68 units

Energy Saved is 1.12 Units or 62% per pumping

The case studies illustrate the saving potential by employing more 'Efficient Solution' first and there is further scope for saving more energy by employing higher efficiency pumps in those categories. The Jet pumps or the Compressor pumps are inherently of low efficiency, as considerably energy is spent in creating that extra suction. The overall Efficiency levels in case of Jet Pumps could be of the order of 8 to 10% and in case of Compressor pumps about 12 to 15%. The conclusion therefore is that Jet or Compressor must be used only as a last resort.



Jet Pump sets – Single and Multi Stages Pump sets are developed to get Suction heads of 20 to about 75 Meters. Normal TEFC Motors are employed along with the Pumps.



Compressor Pump sets – Compressed Air is employed to provide the extra suction and they are easily installed to achieve suction levels from about 20 Meters to 100 Meters or more.



(To be continued)
S. Mahadevan, B.E., F.I.E., M.B.A.,
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SUNIL BHARTI MITTAL
Chairman Bharti Enterprises



Starting with a borrowed capital of Rs. 20,000, He's gone on to create the biggest telecom empire in India.

Sunil Bharti Mittal is an Indian telecom mogul, philanthropist and the founder, chairman and Group CEO of Bharti Enterprises. The US\$8.3 billion turnover company runs India's largest GSM-based mobile phone service and world's fifth largest wireless company with over 190 million customers across 19 countries in Asia and Africa.

Sunil Mittal was born in Ludhiana. His father, Sat Pal Mittal, had been the Member of parliament (M.P) from Ludhiana, who died of cardiac arrest in 1992.

A first generation entrepreneur, Sunil started his first business in April 1976 at the age of 18, with a capital investment of 20000 borrowed from his father. His first business was to make crankshafts for local bicycle manufacturers. In 1980, he along with his brothers Rakesh and Rajan started an Import Enterprise named Bharti Overseas Trading Company.

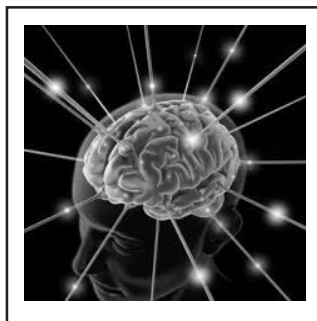
He was one of the first Indian entrepreneurs to identify the mobile telecom business as a major growth area. He launched services in Delhi in 1995, when Bharti Cellular Limited (BCL) was formed to offer cellular services under the brand name Airtel. Within a few years Bharti became the first telecom company to cross the 2-million mobile subscriber mark.

All India Management Association on 21st February, 2007, its 51st anniversary, conferred **JRD Tata Corporate Leadership Award** on Sunil Bharti Mittal. The same year he was also awarded the **Padma Bhushan**, India's third highest civilian honour. In August 2012 Bharti Airtel crossed the 200 million customer mark in India, making it the **world's fourth largest mobile operator** and the **largest in India**. In 2012, he was in talks with Wal-Mart, the US retail giant to start a number of retail stores across India. Bharti - Walmart is billed to be first FDI multi-brand retailer to set up shop in India. He also operates in 17 African countries and is the continent's second largest service provider with a subscriber base of over 61.7 million. Bharti has launched 4G services in Chandigarh, Panchkula and Mohali. **In India Today's High and Mighty Power list 2013, Sunil has been ranked eight.**

POWER YOUR MIND

WHERE IS SOLITUDE?

Land with wild trees is jungle
Land with dry sand is desert
Land with flowers is garden
Land with water is ocean
Land with temples is Tirtha
Land with people is habitation
Land with Sadhus is Ashrama
When man is alone that is solitude



Solitude is but a state of mind,
Calm, serene, tranquil mind.
The only place suitable for
Sadhana
Go there and visit the Landlord,
The Master that is God,
And be happy and peaceful.

Courtesy: Swami Srikantananda

*The Greatest Distance in the World is just 14 inches from the mind to the heart...
Its most difficult to decide whether to go with the Heart or Mind. - Emilys Quotes.com*

BIG, BEAUTIFUL AND SUSTAINABLE – 10 OF THE WORLD’S MOST ENERGY EFFICIENT OFFICES - 2

ONE EMBANKMENT PLACE, LONDON (UK)



Situated on London’s Embankment, this 40,000 m² building was constructed in the early 1990s and underwent extensive refurbishment to achieve the highest BREEAM Outstanding rating recorded worldwide in 2013. PwC, who occupy

the building and masterminded the refurbishment, believe the building provides a strong business case for reusing and refurbishing old buildings. The building uses one of the largest ever tri-generation systems that has reduced the buildings carbon emissions by 51%. The system is fuelled by recycled biodiesel that is produced from waste cooking oil sourced from within the M25. This fuel produces heat, cooling and power to the building. The design of the building also considers its footprint beyond its four walls. The refurbishment saw more cycle storage and showers installed to promote its staff to use sustainable transport methods.

(To be continued...)

THE WORLDS TOP 10 MOST INNOVATIVE COMPANIES IN ENERGY - 2

GE

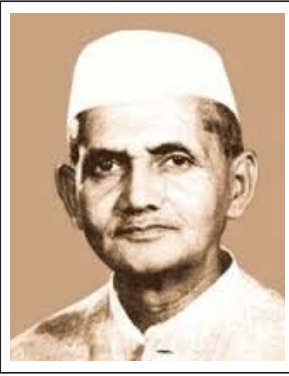


For harnessing the Industrial Internet to build the world’s first intelligent turbine. The huge multinational corporation continues its work in a variety of energy domains, but one of its new wind turbines, known as the “2.5-120,” is of special significance. A new design harnesses the Industrial Internet—GE’s network of sensors and analytics that can significantly optimize machines—and can generate large amounts of power in low winds, a gargantuan leap forward. The turbine also incorporates battery storage systems to account for wind power’s intermittency, resulting in efficiency gains of about 25%. This is, one could argue, the world’s first “truly intelligent” wind turbine.

(To be continued...)

LAL BAHADUR SHASTRI - 2

On 17 September 1965, while the Indo-Pak war was on, India received a letter from China alleging that the Indian army had set up army equipment in Chinese territory, and India would face China's wrath, unless the equipment was pulled down. In spite of the threat of aggression from China,



Shastri declared "China's allegation is untrue". The Chinese did not respond, but the Indo-Pak war resulted in some 3–4,000 casualties on each side and significant loss of material.

The Indo-Pak war ended on 23 September 1965 with a United Nations-mandated ceasefire. In a broadcast to the nation on the day of the ceasefire, Shastri stated: "While the conflict between the armed forces of the two countries has come to an end, the more important thing for the United Nations and all those who stand for peace is to bring to an end the deeper conflict.... How can this be brought about? In our view, the only answer lies in peaceful coexistence. India has stood for the principle of coexistence and championed it all over the world. Peaceful coexistence is possible among nations no matter how deep the differences between them, how far apart they are in their political and economic systems, no matter how intense the issues that divide them."

During his tenure as Prime Minister, Shastri visited many countries including Russia, Yugoslavia, England, Canada, Nepal, Egypt and Burma. Incidentally while returning from the Non Alliance Conference in Cairo on the invitation of then President of the Pakistan Ayub Khan to have lunch with him, Shastri made a stop over at Karachi Airport for few hours and breaking from the protocol Mr. Ayub Khan personally received him at the Airport and had an informal meeting during October 1964. After the declaration of ceasefire with Pakistan in 1965, Shastri and Pakistani President Muhammad Ayub Khan attended a summit in Tashkent (former USSR, now in modern Uzbekistan), organized by Alexei Kosygin. On 10 January 1966, Shastri and Khan signed the **Tashkent Declaration**.

Death

Prime Minister Shastri died in Tashkent, at 2 AM on the day after signing the Tashkent Declaration, reportedly due to a heart attack, but people allege

conspiracy behind the death.^[24] He was the first Prime Minister of India to die overseas. He was eulogised as a national hero and the **Vijay Ghat** memorial established in his memory. Upon his death, Gulzarilal Nanda once again assumed the role of Acting Prime Minister until the Congress Parliamentary Party elected Indira Gandhi over Morarji Desai to officially succeed Shastri.

Mystery behind Lal Bahadur Shastri's death

Shastri's sudden death immediately after signing the Tashkent Pact with Pakistan raised many questions in the minds of Indian citizens. The Prime Minister of India going to Tashkent for a pact and never coming back has not been accepted easily by Indian citizens. His health was fit as per his personal physician, Dr. R. N. Chugh, and he had no sign of heart trouble before.

Shastri's sudden death has led to persistent conspiracy theories that he was poisoned. The first inquiry into his death, conducted by the Raj Narain Inquiry, as it came to be known, however did not come up with any conclusions, and today no record of this inquiry exists with the Indian Parliament's library. It was alleged that no post-mortem was done on Shastri, but the Indian government in 2009, claimed it did have a report of a medical investigation conducted by Shastri's personal physician, Dr. R. N. Chugh, and some Russian doctors. Furthermore, the Prime Minister's Office (PMO) revealed that there was no record of any destruction or loss of documents in the PMO having a bearing on Shastri's death. The Russian butler attending on Shastri at the time of his death was arrested for suspected poisoning but released later as per the news source. It was maintained that Shastri had died of cardiac arrest but his family insisted he was poisoned.

After Shastri's death (aged 62) in Tashkent, USSR, on 11 January 1966, soon after signing the Tashkent Pact with Pakistan, his wife Lalita Shastri had alleged he was poisoned. An epic poetry book in Hindi titled *Lalita Ke Aansoo* written by Krant M. L. Verma was published in 1978. In this book, the tragic story about the death of Shastri has been narrated by his wife Lalita Shastri. There are still serious doubts surrounding the nature of his death. His son, Sunil Shastri, asked the government to unravel the mystery behind Lal Bahadur Shastri's death. Raising doubts about the dark blue spots and cut marks on the abdomen of his father's body after his death in 1966, Sunil asked how the cut marks appeared if a post-mortem had not been conducted.

When Shastri went to the USSR for the Tashkent talks, he wanted a promise from Ayub Khan that Pakistan would never use force in the future. But the talks did not proceed and followed Shastri's death on the next day. The Indian Government released no information about his death, and the media then was kept silent. The possible existence of a conspiracy was covered in India by the *Outlook* magazine. A query was later posed by Anuj Dhar, author of *CIA's Eye on South Asia*, under the Right to Information Act to declassify a document supposedly related to Shastri's death, but the Prime Minister's Office refused to oblige, reportedly citing that this could lead to harming of foreign relations, cause disruption in the country and cause breach of parliamentary privileges. Another RTI plea by Kuldip Nayar was also declined, as PMO cited exemption from disclosure on the plea. The home ministry is yet to respond to queries whether India conducted a post-mortem on Shastri, and if the government had investigated allegations of foul play. The Delhi Police in their reply to an RTI application said they do not have any record pertaining to Shastri's death. The Ministry of External Affairs has already said no post-mortem was conducted in the USSR. The Central Public Information Officer of Delhi Police in his reply dated 29 July said, "No such record related to the death of the former Prime Minister of India Lal Bahadur Shastri is available in this district... Hence the requisite information pertaining to New Delhi district may please be treated as nil." This has created more doubts.

The PMO answered only two questions of the RTI application, saying it has only one classified document pertaining to the death of Shastri, which is exempted from disclosure under the RTI Act. It sent the rest of the questions to the Ministry of External Affairs and Home Ministry to answer. The MEA said the only document from the erstwhile Soviet Government is "the report of the Joint Medical Investigation conducted by a team comprising Dr. R. N. Chugh, Doctor in-Attendance to the PM and some Russian doctors" and added no post-mortem was conducted in the USSR. The Home Ministry referred the matter to Delhi Police and National Archives for the response pertaining to any post-mortem conducted on the body of Shastri in India. Sunil Shastri, son of the former Prime Minister, called the transferring of application as "absurd" and "silly joke". "He (Lal Bahadur Shastri) died as sitting Prime Minister. It sounds very silly that MHA is referring the matter of death of second Prime Minister of India to a district level police." He also demanded that "It should be looked into by highest authorities like President, Prime Minister and home minister."

Later, Gregory Douglas, a journalist who interviewed former CIA operative, Robert Crowley, over a period of 4 years, recorded their telephonic conversations and published its transcribe in a book titled, "Conversations with the Crow". In the book, Crowley claimed that CIA was responsible for eliminating Dr. Homi Bhabha, Indian nuclear scientist whose plane crashed into Alps, when he was going to attend a conference in Vienna and Lal Bahadur Shastri, who died at Tashkent summit in 1966. Crowley said that USA was wary of India's rigid stand on nuclear policy and then PM Lal Bahadur Shastri, who wanted to go ahead with nuclear tests. He also said that agency was more worried about collective domination of Indo-Russian over the region, for which a strong deterrent was required.

Family and descendants

On 16 May 1928, Shastri married Lalita Devi a lady from Mirzapur. The marriage, which was arranged by their parents in the traditional Indian way, was harmonious and conventional. The couple were blessed with four sons and two daughters, namely

1. Kusum Shastri, the eldest daughter
2. Hari Krishna Shastri, eldest son, who was married to Vibha Shastri
3. Suman Shastri, second daughter, married to Vijay Nath Singh. Her son, Siddharth Nath Singh, is a spokesman of the Bharatiya Janata Party
4. Anil Shastri. He is married to Manju Shastri. Alone in his family, he remains a member of his father's Congress Party. His son Adarsh Shastri gave up his corporate career with Apple Inc to contest the General elections of 2014 from Allahabad on an Aam Aadmi Party ticket. He lost that election.
5. Sunil Shastri. He is married to Meera Shastri. He is a member of the Bharatiya Janata Party.
6. Ashok Shastri, the youngest son. He worked in the corporate world before his untimely death at the age of 37. His wife Neera Shastri and his son Sameep Shastri are members of the Bharatiya Janata Party.

Legacy

Ramachandra Guha argued that Shastri shared little in common with his predecessor Jawaharlal Nehru. While Shastri preferred peace with Pakistan, writing to a friend after the Indo-Pakistani War in 1965 that the problems between both countries should be settled amicably, he had previously displayed a knack for taking quick and decisive actions during the war. He swiftly took the advice of his commanders, and

ordered a strike across the Punjab border. This was in stark contrast to Nehru who in a similar situation in 1962, had refused to call in the air force to relieve the pressure on the ground troops. At the end of the conflict, Shastri flamboyantly posed for a photograph on top of a captured US-supplied Pakistani M48 Patton tank.

However, in common with Nehru, Shastri was a secularist who refused to mix religion with politics. In a public meeting held at the Ram Lila grounds in Delhi, a few days after the ceasefire, he complained against a BBC report which claimed that Shastri's identity as a Hindu meant that he was ready for a war with Pakistan. He stated: "While I am a Hindu, Mir Mushtaq who is presiding over this meeting is a Muslim. Mr. Frank Anthony who has addressed you is a Christian. There are also Sikhs and Parsis here. The unique thing about our country is that we have Hindus, Muslims, Christians, Sikhs, Parsis and people of all other religions. We have temples and mosques, *gurdwaras* and churches. But we do not bring all this into politics. This is the difference between India and Pakistan. Whereas Pakistan proclaims herself to be an Islamic State and uses religion as a political factor, we Indians have the freedom to follow whatever religion we may choose, and worship in any way we please. So far as politics is concerned, each of us is as much an Indian as the other".

Kuldip Nayar, Shastri's media advisor from 1960 to 1964, recalls that, during the Quit India Movement, his daughter was ill and he was released on parole from jail. However, he could not save her life because doctors had prescribed costly drugs. Later on in 1963, on the day when he was dropped from the cabinet, he was sitting in his home in the dark, without a light. When asked about the reason, he said as he no longer is a minister, all expenses will have to be paid by himself and that as a MP and minister he didn't earn enough to save for time of need.

Although Shastri had been a cabinet minister for many years in the 1950s, he was poor when he died. All he owned at the end was an old car, which he had bought in instalments from the government and for which he still owed money. He was a member of Servants of India society (which included Gandhi, Lala Lajpat Rai, Gopal Krishna Gokhle) which asked all its members to shun accumulation of private property and remain in public life as servants of people. He was the first railway minister who resigned from office following a major train accident as he felt moral responsibility.



- The foundation stone of **Bal Vidya Mandir**, a distinguished school of **Lucknow**, was laid by him during his tenure as the Prime Minister, on 19 November 1964.
- He inaugurated the **Central Institute of Technology Campus** at **Tharamani**, Chennai, in November 1964.
- He inaugurated the **Plutonium Reprocessing Plant** at **Trombay** in 1965. As suggested by Dr. Homi Jehangir Bhabha, Shastri authorized the development of nuclear explosives. Bhabha initiated the effort by setting up the nuclear explosive design group Study of Nuclear Explosions for Peaceful Purposes (SNEPP).
- He inaugurated the **Andhra Pradesh Agricultural University** at **Hyderabad** on 20 March 1965 which renamed as Acharya N. G. Ranga Agricultural University in 1996 and renamed again in July 2014 as Professor. Jayashanker Agricultural University and National Institute of Technology, Allahabad.
- Lal Bahadur Shastri inaugurated the **Jawahar Dock of the Chennai Port Trust** & starts the construction work of **Tuticorin Port (Now VOC Port Trust)** in November 1964.
- He inaugurated **Sainik School Balachadi**, in State of Gujarat. He laid the foundation stone of Almatti dam. Now the commissioned dam bears his name.

Memorials

Shastri was known for his honesty and humility throughout his life. He was the first person to be posthumously awarded the **Bharat Ratna**, and a memorial "**Vijay Ghat**" was built for him in Delhi.

Several educational institutes, Lal Bahadur Shastri National Academy of Administration (Mussorie, Uttarakhand) is after his name.

- Lal Bahadur Shastri Institute of Management was established in Delhi by the 'Lal Bahadur Shastri Educational Trust' in 1995 as is one of the top business schools in India.
- The Shastri Indo-Canadian Institute was named after Shastri due to his role in promoting scholarly activity between India and Canada.
- *Lal Bahadur Shastri Memorial* run by Lal Bahadur Shastri National Memorial Trust, is situated next to 10 Janpath his residence as Prime Minister, at 1, Motilal Nehru Place, New Delhi.
- In 2011, on Shastri's 45th death anniversary, Uttar Pradesh Government announced to renovate Shastri's ancestral house at Ramnagar in Varanasi and declared plans to convert it into a biographical museum.



- Varanasi International Airport is named after him.
- Lal Bahadur Shastri Centre For Indian Culture with a Monument and a street is named after him in the city of Tashkent, Uzbekistan.
- Few stadiums are named after him in the cities of Hyderabad, Andhra Pradesh Ahmadabad in

Gujarat and another one at Kollam, Kerala. Shastri Road in Kottayam, Kerala

- The Almatti Dam is renamed as Lal Bahadur Shastri Sagar in Northern Karnataka built across the River Krishna. The foundation stone was laid by him.
- MV Lal Bahadur Shastri a Cargo Ship is named after him.
- RBI released coins in the denomination of Rs.5 during his birth century celebrations.
- All India Lal Bahadur Shastri Hockey tournament is held every year since 1991 an major tournament in the field of Hockey.
- The Left Bank Canal form the Nagarjuna Sagar Dam in AP is named Lal Bahadur Shastri Canal which is 295 km in Length.
- Life size statues of Shastri are erected at Mumbai, Bangalore (Vidhana Soudha), New Delhi (CGO Complex), Almatti Dam Site, Ramnagar-UP, Hisar, Vizagapattinam, Nagarjuna Dam site.
- Life size bust of Shastri are erected at Thiruvandram, Pune, Varanasi(Airport), Ahmedabad (lake side), Khrushetra, Shimla, Kasargod, Indore, Jalandar, Mhow, Uran.
- Some Major Roads in the Cities of New Delhi, Mumbai, Pune, Puduchery, Lucknow and Allahabad bearing the name of the Legend.
- In 2005, the Government of India created a chair in his honour in the field of democracy and governance at Delhi University.



*Lal Bahadur
Shastri National
Academy of
Administration,
Mussoorie*

தமனிகளில் அடைப்பு உள்ளது என்பதை வெளிப்படுத்தும் ஆச்சரியப்பட வைக்கும் சில அறிகுறிகள்!!!

தமனிகளில் தடிப்பு உள்ளது என்றும், இதய நோயால் பாதிக்கப்படப்போகிறோம் என்பதை 4 அறிகுறிகள் கொண்டு அறியலாம் என்று மருத்துவர் ஒருவர் கூறுகிறார். மேலும் அமெரிக்காவில் ஒவ்வொரு வருடமும் 7,00,000 மேலான மக்கள் மாரடைப்பாலும், 4,00,000 மக்கள் இதயச் சுவர்ச்சிரை நோய் என்னும் கரோனரி இதய நோயாலும் பாதிக்கப்படுவதுடன், அவர்களுள் சிலர் இறக்கின்றனர். பொதுவாக ஒவ்வொருவரும் இதய நோய் வருவதற்கு காரணமாக இருக்கும் செயல்களை தவிர்க்க வேண்டும். ஒருவேளை அப்படி இதய நோயால் பாதிக்கப்பட்டிருந்தால், அதனை ஆரம்பத்திலேயே கண்டுபிடித்தால், குணமாகும் வாய்ப்பு அதிகம் உள்ளது. அதற்கு செய்ய வேண்டியதெல்லாம் வாழ்க்கை முறை மற்றும் பழக்கவழக்கங்களில் சிறு மாற்றங்களை கொண்டு வர வேண்டும்.

சரி, மாரடைப்பு எப்படி ஏற்படுகிறது? இதயத்திற்கு செல்லும் இரத்த குழாய்களில் அடைப்புகள் இருந்தால் மாரடைப்பு ஏற்படும். அப்படி இதயத்திற்கு செல்லும் இரத்த குழாய்களில் ஒன்று தான் தமனி. அத்தகைய தமனியில் அடைப்பு ஏற்பட்டிருந்தாலோ அல்லது வேறு இதய நோயால் பாதிக்கப்பட நேர்ந்தாலோ வெளிப்படும் அறிகுறிகளை கேட்டால், உங்களுக்கு ஆச்சரியமாக இருக்கும் சரி, அது என்ன அறிகுறிகள் என்று பார்ப்போமா!!

வழுக்கைத் தலை:

ஆய்வு ஒன்றில் 37,000 வழுக்கைத் தலை ஆண்களைக் கொண்டு சோதனை செய்ததில், அவர்களுக்கு எப்போது

வேண்டுமானாலும் இதய நோயால் பாதிக்கக்கூடும் என்று கண்டுபிடிக்கப்பட்டுள்ளது. அதுமட்டுமின்றி, மற்றொரு ஆய்வில் வழுக்கைத் தலை கொண்ட ஆண்கள் மற்றும் பெண்களைக் கொண்டு செய்யப்பட்ட சோதனையில், இரு பாலினத்தவருக்கும் இதய நோய் வருவதற்கான வாய்ப்பு இரண்டு மடங்கு அதிகம் உள்ளது என்று கண்டுபிடிக்கப்பட்டுள்ளது.

காதுகளில் மடிப்புகள்:

காதுகளில் மடிப்புகள் அல்லது கோடு போன்று வெட்டுக்கள் ஏதேனும் காணப்பட்டால், அது இதய நோயானது எப்போது வேண்டுமானாலும் வரும் வாய்ப்பு உள்ளது என்று ஆய்வு ஒன்றில் நிரூபிக்கப்பட்டுள்ளது. அதிலும் இந்த மாதிரி காது இருந்தால், உடலில் இரத்தம் ஓட்டம் மிகவும் மோசமாக இருக்கும். குறிப்பாக இதயத்திற்கு இரத்தம் செல்வது கஷ்டமாக இருக்கும்.

கெண்டைக்கால் வலி:

நடக்கும் போது கெண்டைக்காலில் வலி இருந்தாலும், அதுவும் தமனிகளில் லேசாக அடைப்பு ஏற்பட ஆரம்பித்துள்ளது என்பதற்கான அறிகுறிகளுள் ஒன்றாகும். எனவே இந்த மாதிரியான வலியை நீங்கள் உணர்ந்தால், உடனே மருத்துவரை அணுகுங்கள். மேலும் தாவர உணவுகளை அதிகம் எடுத்துக் கொண்டு அசைவ உணவுகளை குறைவாக எடுத்து வாருங்கள். இந்த செயலை மேற்கொண்டு வந்தால், இதய நோய் வருவதைத் தடுக்கலாம்.

Courtesy: pesot, January 2016

HUMOUR

Turn Up Or Down The Air Conditioner...?

A customer was continually bothering the waiter in a restaurant, at first he'd asked that the air conditioning be turned up because he was too hot, then he asked it be turned down because he was too cold, and so on for about half an hour.

Surprisingly, the waiter was very patient, he walked back and forth and never once got angry. So finally, a second customer asked him why he didn't throw out the pest.

"Oh, that man I don't care." said the waiter with a smile. "We don't even have an air conditioner."

Computer Analogies...

1. Home is where you hang your @.
2. The email of the species is more deadly than the mail.
3. A journey of a thousand sites begins with a single click.
4. You can't teach a new mouse old clicks.
5. Great groups from little icons grow.
6. Speak softly and carry a cellular phone.
7. In some places, C: is the root of all directories.

8. Oh, what a tangled Website we weave when first we practice.

9. Pentium wise, pen and paper foolish.

10. The modem is the message.

11. Too many clicks spoil the browse.

12. The geek shall inherit the earth.

13. Don't byte off more than you can view.

14. Fax is stranger than fiction.

15. What boots up must come down.

16. Windows will never cease.

17. Virtual reality is its own reward.

18. Modulation in all things.

19. Give a man a fish and you feed him for a day, teach him to use the Net and he won't bother you for weeks.

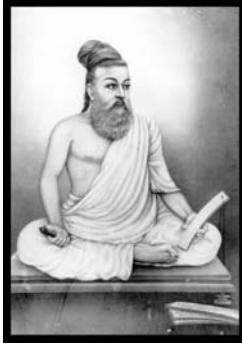
20. There's no place like your homepage.

What is...?

Q. What is a snake's favorite subject?

A. Hissssssstory

TIRUKKURAL AND MANAGEMENT IN A 'NUTSHELL' – 41



Peter Drucker, the Guru of Modern Management sums up in a nutshell that the Essence or “Excellence in Management” is to ‘Foresee what will happen and Make it happen’. Tiruvalluvar deals with the same concept much more comprehensively and in more dimensions in one of the ‘Adhikarams’ dealing with ‘Wisdom’. In fact he combines Knowledge and Wisdom into a term called “*Arivu*”. Three of the Kurals chosen below will illustrate the great ideas brought out by Tiruvalluvar.

“*Arivudaiyaar Aavathu Arivaar Arivilaar Akthuari Kalla Thavar*” *Kural 427*

அறிவுடையார் ஆவது அறிவார் அறிவிலார்
அ.துஅறி கல்லா தவர். குறள் 427

“The wise foresee what is to come
The unwise lack in that wisdom.”

“*Arivatram Kakkum Karuvi Seruvaarkkum Ullazhikkal akaa Aran*” *Kural 421*

அறிவற்றம் காக்கும் கருவி செறுவார்க்கும்
உள்ளழிக்கல் ஆகா அரண். குறள் 421

“Wisdom’s weapon wards off all woes
It is a fort defying foes”

“*Ethirathak Kakkum Arivinarkku Illai Athira Varuvathor Noy*” *Kural 429*

எதிரதாக் காக்கும் அறிவினார்க்கு இல்லை
அதிர வருவதோர் நோய் குறள் 429

“No frightful evil shocks the wise
Who guard themselves against surprise”

HOME FESTIVALS – 10

ஐப்பசி - Aippasi(October/November)



Skanda shasti is the first festival of this month(right), commemorating the victory of Lord Murugan over the demon Sura, of the higher, spiritual self over the lower nature. Dipavali is the major event of Aippasi, celebrated everywhere Hindus live and by Buddhists and

Jains, too. In one story of its origins, Vamana, the dwarf avatar of Lord Vishnu, requests the amount of land from King Bali that he can cover in three steps. Granted the request, Vamana covers with his first step all of the Earth, with the second all of the sky, and then asks the king where to take the third step. The king offers his own head (lower left), and in commemoration of the king’s humility, the day was established. In another story, Lord Vishnu (centre) kills the demon Nagagasvaran with His discus. The various observances (lower right) of Dipavali include an oil bath, gifts of new clothes, fireworks (sufficiently indulged in Chennai to rattle dishes off the kitchen shelves), oil lamps for display and abundant pots of delicious food. The early morning bath is always considered to be in the Ganga itself, so one greeting of the day is, “Did you have the Ganga bath?”

(To be continued)

You can't fall if you don't climb, but there's no joy in living your whole life on the ground - Proverb



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