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NEWS LETTER

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

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EVENTS



International Green Building Conference 2014 Singapore

Events Profile: Organised by the Building and Construction Authority of Singapore and having its sixth run from 1 – 3 Sep 2014, the Singapore Green Building Week (SGBW) will play host to international green building experts, policy-makers, academics and built environment practitioners, for a congregation of ideas, collaboration and learning, to achieve a shared vision of a greener planet through the greenbuilding movement.

Date: 1st – 3rd September 2014

Venue: Marina Bay Sands, Singapore

Website: <http://www.sgbw.com.sg/about-igbc>



Events Profile: This event will serve as an addition for the highly successful Intersolar India in geographical terms, thus the content-related focus will be on the southern parts of India and take place at the same time as the electronica/productronica exhibition in September.

Date: 22nd September 2014

Venue: Vivanta By Taj, 2275, Tumkur Road, Yeswantpur, Bangalore, India

Website:

<https://www.intersolarglobal.com/index.php?id=4956>



Events Profile: Intersolar India is India's largest exhibition and conference for the solar industry and, as a leading industry platform, focuses on the areas of photovoltaics, PV production technologies, energy storage and solar thermal technologies. In 2013, a total of 170 companies from 14 countries attended the exhibition.

Date: 18th – 20th November 2014

Venue: Mumbai, India

Website: <http://www.intersolar.in/en/intersolar-india.html>

DESIGN LIGHTING TOKYO 2015

1st Tokyo Design Lighting Expo & Conference

Events Profile: DESIGN LIGHTING TOKYO is a venue for business meetings between exhibitors and visitors. Design lightings that enrich the atmosphere will be showcased and plenty of users as architects, designers, etc. that seek stylish design lightings will gather here in Tokyo.

Date: 14th – 16th January 2014

Venue: Tokyo Big Sight, Japan

Website: <http://www.design-lighting.jp/en/>



2015 IEEE-IEEMA INTELECT Conference and Exposition
Conference theme: Smart Electricity for Emerging Markets

Events Profile: Featuring live, life size experience walk-through pavilions conceptualized and designed by a technical committee from IEEE and IEEMA & supported by leading ecosystem players

Date: 22nd – 24th January 2014

Venue: Bombay Exhibition Centre, Mumbai, India

Website: <http://www.ii-intelect.org/>

EDITORIAL

Dear Members, Fellow Professionals, Friends and Well wishers,

"Happy Independence Day" and Seasons Greetings to One and All!

15th August brings us the memories of freedom struggles and the struggles later for taking care of ourselves and growth from utter poverty. We are all aware of our great heritage, civilization and prosperity and our reduction to an utterly poor nation caused by almost 600 years of invasions, loots and colonial rule. Though being a vast and diversified Nation, our founding fathers decided that we will be united and will remain a Democracy and today one of our greatest prides is that we remain one of the largest democracies of the World. The demand for growth from the first day of Independence was very urgent as the shortages were in everything starting from food to all basic needs. From then till now, it is commented by many that Democracy has been a factor that slowed down the speed of growth, but we have always considered Democracy as an important and uncompromisable value.

A broad look at growth since independence can make us rightly feel proud that there has been lot of progress with lot of promises for the future. We have lots of many things today if not everything, but still the poverty looms in many sections of people and 'below poverty line' numbers are scaring. One of the reasons for it can be attributed to increasing number of 'internal looters' who are not disowned or punished fast due to our democratic and legal systems.

In terms of Energy and comforts, there have lot of progress since 1947/ 1950 and just the example of Electricity will illustrate this. Installed capacity of Power Generation has gone up from mere 1400 MW to 2,30,000 MW at present and per capita consumption from mere 17 Units per head per annum to 920 Units per head per annum. Our GDP has grown steadily and there is growth in all sectors including Food and Agriculture and Industries Trade and Commerce and Services and so on, but one of the important problems is our poor efficiencies in everything we do. It is calculated that we use almost 8 times more Energy Resources per unit of GDP. Looking at Electrical Energy use, it is calculated that we use 4 times more Electrical Energy per unit of 'Work done' compared to International averages. As we are all aware, one of the continuing crisis/challenges faced by Governments at the Centre and the States is Power Shortage. Government of India, therefore, is organizing work, to meet all the challenges of increased Power Generation, alternative and Renewable sources of Energy and Efficiency Improvements and Standards and Auditing and Training etc, through its Ministry of Power, Ministry of New and Renewable Energy and Bureau of Energy Efficiency. Government is continuously striving to achieve progress in all fronts and it can be fruitful if only there is involvement and contribution by Electrical and all disciplines of engineering fraternity. Some of the ongoing plans and programs of the Government include, annual and five years plans and policies for adding generation capacities, Missions and supports and subsidies for various renewable energy missions, Energy Conservation Acts and policies and programs for efficiency improvements towards attaining international standards and training and accrediting Energy Auditing professionals and so on.

At the grass root level, there seems to be considerable awareness with regard to ☆Marks on Refrigerators, Air Conditioners and many other gadgets etc and the efficiencies of CFL and LED Lights etc, but we still have a long way to go with regard to Industries, small, medium and large and Agriculture and commercial use of Energy etc. It will be very hard to believe that the overall Efficiency of Electricity use from Generation to End use in Indian context is a mere 4% and what we need to aim at is around 15%. The main keys lie in T & D Losses and End use Losses. These are sizable and require in depth study and implementation. Galloping Technological Developments in all areas of Materials, Machines, Manufacturing and Controls can help sizably to improve overall Efficiencies.

*Another important thing to celebrate in the month of August is the **Birth Day of CHENNAI.***

Our city completes 375 years of age in August 2014. (It was born on August 22, 1639).

We thank all those members who have helped us by participating in the advertisements appearing for the issue July 2014 – Emaar Electricals, Vie Soleil Engineers Pvt. Ltd., Velohar Infra Pvt. Ltd., Devsee Electricals, FLIR Systems India Pvt. Ltd., Abirami Electricals, Power Links, Universal Earthing Systems Pvt. Ltd., Wilson Power and Distribution Technologies Pvt. Ltd., Cape Electric Pvt. Ltd., Max Electric Co., Elmeasure India Pvt. Ltd., Galaxy Earthing Electrodes Pvt. Ltd., Heat Craft Engineers Pvt. Ltd., Sri Bhoomidurga Marketing Pvt. Ltd., Faith Power Solutions, Electrotherm (India) Ltd., Ashlok Safe Earthing Electrode Ltd.

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	PAGE NO.
Events	4
Editorial	5
Contents	6
Members Details	7
Know Thy Power Network – 83	8-9
Aditya Birla Private Equity to pick up 8% stake in Indian Energy Exchange Ltd for Rs 136 Crore	10
Contribution to Newsletter	10
IBM Research Launches Green Horizon in China	11-12
Wind Power Capacity set to Rise after FM's incentive	12
Book Price List	16
IBC Solar begins construction of 5.5MW Solar Plant in Rajasthan	17
India Pledges \$250 Million to Grid improvements, Solar Power	18
USGBC Announces expanded support for Leed Green Building Program in India	20-21
Wind farm fires far more common than reported, study finds	22
National Solar Mission back with a bang	23
Product of the Month – FLIR VS70 Videoscope	24
NEWSLETTER – 100 th Issue Celebration – Photos	25-26
National Electrical Code of India 2011 - Seminar Photos	32
Optimization of Air Insulation Clearances for EHV/UHV Transmission Lines - 2	33-36
Researchers Create Multifunctional Nanoparticles for cheaper, cleaner Biofuel	37
Technology Series Part – 1/A	38-39
GE claims fuel cell breakthrough, starts pilot production	40
India Ready with draft policy to reduce emissions from deforestation	45
Maruthi Suzuki – Solar initiative	45
Google acquires Airborne Wind Power Company Makani	46
Tryst with Destiny – Jawaharlal Nehru 14-15 August 1947	47
How to Harness Rainwater	48
Tiruppur Kumaran	49
இரவு நன்றாக தூங்க உதவும் 5 உணவுகள்	50
Home Festivals – 8	51
Dasopadesam	51
Tirukkural and Management in a 'Nutshell' – 16	51
Miami Tower	52-53

ADVERTISEMENTS

	PAGE NO.
Abirami Electricals	29
Ashlok Safe Earthing Electrode Ltd.	14
Blue Sea Power Solutions (P) Ltd.	2
Cape Electric Pvt. Ltd.	28
EA Facilities Services Pvt. Ltd.	3
Elmeasure India Pvt. Ltd.	55
Ess Enn Power Controls Pvt. Ltd.,	19
EVR Electricals Pvt. Ltd.	44
Faith Power Solutions	41
FLIR Systems India Pvt Ltd.	30
Galaxy Earthing Electrodes Pvt. Ltd.	54
Heat Craft Engineers Pvt. Ltd.	36
Intrans Electro Components Pvt. Ltd.	31
Larsen & Toubro Ltd.	13
Max Electric Co.	43
Power Cable Corporation	42
Power Links	7
Sivasakthi Electricals	56
Tandem Enterprises	1
Universal Earthing Systems Pvt. Ltd.	27
Wilson Power and Distribution Technologies Pvt. Ltd.	15

MEMBERS DETAILS

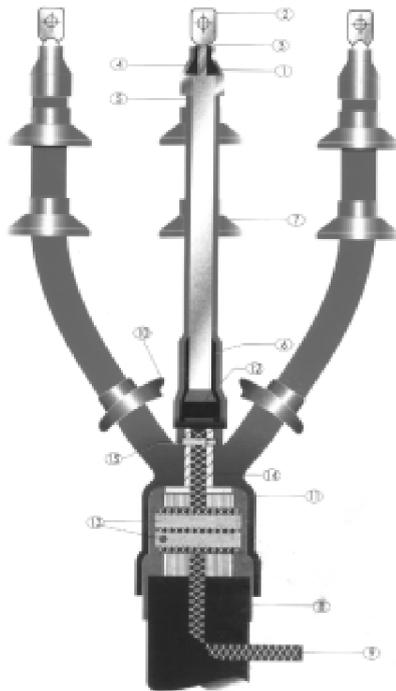
S.No.	Company Name	License No.	Place	Contact No.
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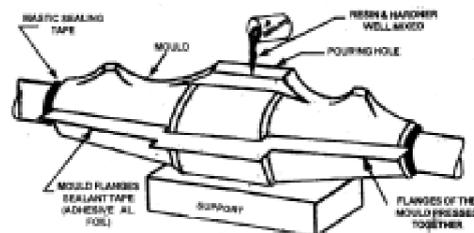
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Let us make further journey. I would like to share the some more information on Smart items currently in use for your kind understanding. FIFA World Cup football matches are currently going on in Brazil. The whole world is agog with these matches. Why should we lag behind. So let us start with SMART BOTTLES.

I SMART BOTTLES

Smart bottles are nothing but the special drinks given to World Cup players to quench their thirst and also to mitigate their dehydration. The point that needs notice in this context is that these drinks are not of ordinary type. They are made specially for each player. Each one of them is treated as a “separate entity”. Each player’s needs are considered on the basis of their playing skills, their urine and sweat samples and the bottle concerned carry special drinks to meet these requirements. All these bottles may appear to be the same from outside but they carry different kinds of drinks. Each of them is labelled and carry the specially prepared drinks for the consumption of the designated players only.



II SMART GOALS

This term is widely used in Industries, specially for the skill development of the workers and other staff. These smart goals share an articulate time bound plan of action with specific tasks assigned which are measurable in nature.

III SMART SHOPPING

Can you show me any one who is not interested in shopping? Without exception, all are interested in doing trips for shopping. Then I ask why not make it as “Smart”, a memorable trip both for your purse and yourself as well. As an illustration, the benefits that would accrue while shopping for a ‘Smart kitchen’. Let us see what are the Smart options or offers available in the market.

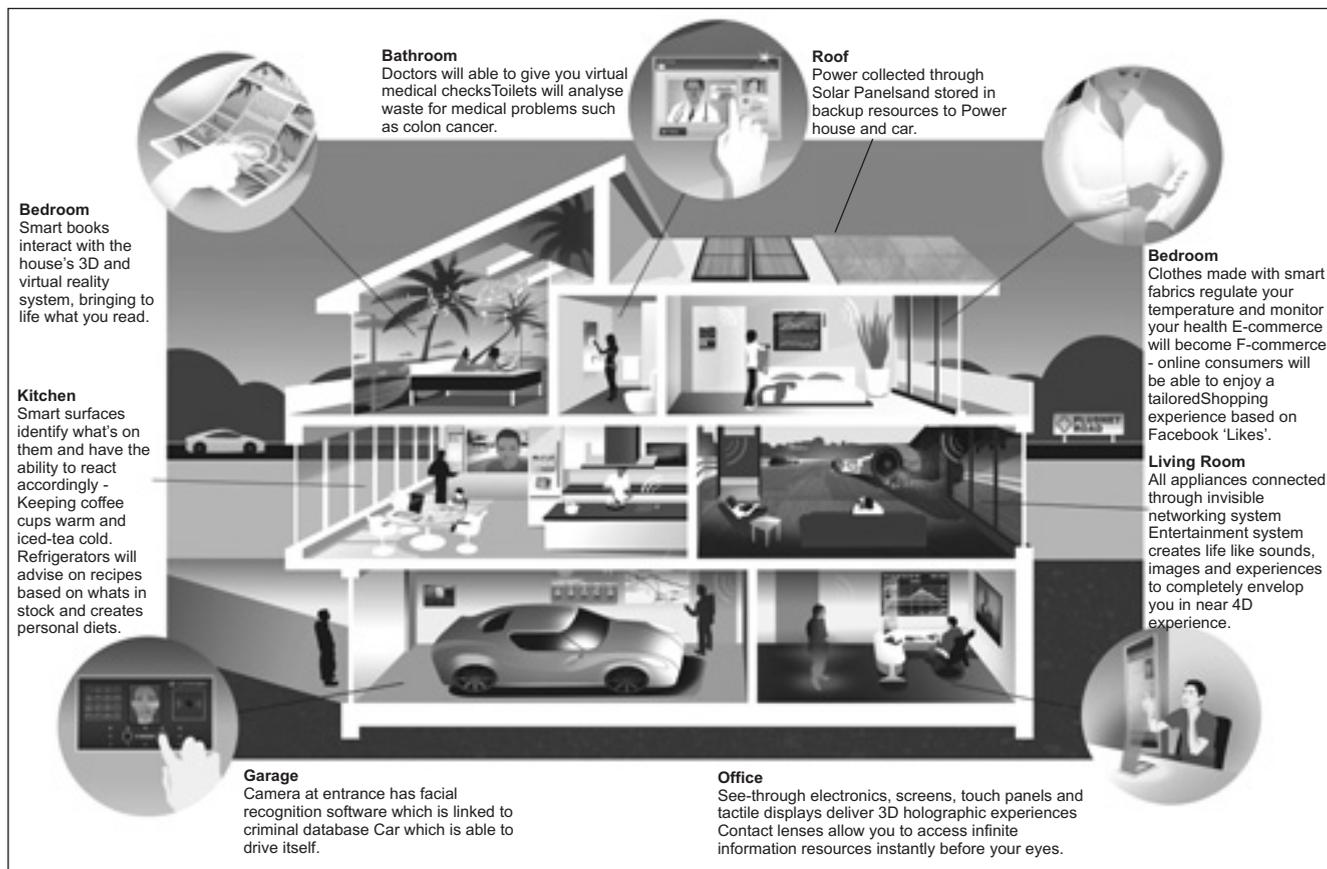
- **Smart Exchange** – If you have any kitchen ware, which undergo the process of ageing, this exchange mode is more beneficial. Then notable discounts can be got/expected for the exchange of old kitchen ware which are in use.
- **Smart freebies** – Today Smart freebies are essential for any product. Hence we should not fail to get quality products given free with every purchase.
- **Smart Swap** – This is another method of getting some benefits. It is generally offered in place of free offers. You can either interchange or swap any products in use with the quality products of the same or higher price by paying the difference.
- **Smart Billing** – This is also offered as incentives like discounts, free gifts or exchange benefits. The choice is yours.
- **Smart Points** – This method is followed to have the continued relationship with the customers. Normally the retailers provide a smart loyalty card for the eligible consumers. Every time you shop you pick up bonus points and additional discounts. These bonus points are converted into cash payments/cash discounts at a later date on reaching a preset level.
- **Smart Payment** – The consumers are provided with many options. They can choose to pay by Credit Card, Debit Card, Gift Cards, Sodexo or by any other Smart means.

IV Smart Homes

When Smart Grids have a wider focus, can Smart Homes lag behind? Now Soft wares make it possible to have these dream homes (intelligent homes) controlled by Smart phones. A Smart Home is a Wi-Fi wonderland where Locks, Lights, Toasters, Smoke detectors, televisions, Music systems, Air Conditioners, Washing machines and all the basic machineries that exist within the four walls of our houses can be controlled via our Smart Phones. You can treat these homes as “**Remote Controlled Homes**”. The main agenda of this Smart Concept is increasing comforts and efficiency. In future many big changes will occur in the way we live. ***It is not an imagination but a reality.*** Many basic building blocks have already been created. To cite examples, the robotic vacuum cleaners will clean our homes when we are away. Our refrigerators would maintain an account of food items and key constituents of cooking placed inside it and order them when these items ran short and also suggest possible recipes for our dinner/lunch on the basis of the materials in stock. *The Smart phones now revolutionise the way we work, play, shop and learn. There is no surprise when our future Smart homes also resonate with these Smart phones. Don’t think that these Smart homes are not without any problems or challenges. The*

issues like security and privacy occupy the areas of prime concerns and now new safeguards and newer tradeoffs are being tried. Now it is the turn of the Smart phones to warrant our attention. As I wrote in my last article, Smart Phones are performing many odd jobs for us. It is desirable to know what they are doing for us or could do for us. These phones now

- Function as a remote control
- Check our pulse rate, heart beatings and the way in which we are burning our calories i.e. efficiently or inefficiently.
- Prevent/Curtail drunk dialing.
- Measure the speed of a vehicle or any moving object i.e. you can measure how your friends are running or how fast they can bowl a cricket ball. The latest Soft wares make these as possible.
- Work as a 'tape' measure by using its inbuilt accelerometer.



Now it is time for us to go back to our main topic "Smart Grid related issues". Please reconnect with the last article where we have studied the security levels of the Smart Grid. The reliability and security of physical structure part of the Smart Grid is known to all. Now we can learn about the reliability issues of the Communication system that forms a part of the cyber structure of the Smart Grid. This reliability issue of Communication has several facets which include the probability of the complete loss of messages/data, presence of redundant Communication paths, automatic methods to protect against message loss, the expected time delay and its variability in delivering a message and the quality of service. To meet the needs of any given power system application, each of these parameters together with the provisioning of alternate communication paths and automatic failover need to be engineered into the communication service. To put it simply, it can be stated that low bandwidth and high latency which is required for Automated Metering Infrastructure applications, high bandwidth and moderate latency which is required for human interface applications and low bandwidth, low latency and low filter for Power Systems Communication protection are required to be considered. Thus technicality and the needs of each Communication application that demands attention are to be clearly understood before creating the necessary Communication Infrastructure. Let me sign off here.



(To be continued...)
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ADITYA BIRLA PRIVATE EQUITY TO PICK UP 8% STAKE IN INDIAN ENERGY EXCHANGE LTD FOR Rs 136 CRORE

Aditya Birla Private Equity fund, owned by billionaire Kumar Mangalam Birla, will purchase an 8% stake in Indian Energy Exchange Ltd (IEX), India's largest electricity exchange by volume, for Rs 136 crore, valuing it at Rs 1,700 crore, two persons with direct knowledge of the development said. The investment reflects the renewed interest in India's power sector as the new government is expected to push reforms to help companies build power plants and facilitate access to coal after delays in various regulatory clearances and lack of fuel supplies hit the sector hard in the past few years.

"Investors expect the power sector to turn around soon and volumes on the exchange have been rising in the past few months," said one of the two persons cited above. The Birla PE fund earlier purchased a 3% stake in the Bombay Stock Exchange, Asia's oldest, and a 1% stake in Ratnakar Bank, which is now planning a public offer. The fund is said to be buying the stake from IDFC Private Equity. Bharat Banka, Birla PE managing director, did not respond to calls on his mobile phone. SN Goel, IEX managing director and CEO, declined to comment.

The trading volumes of renewable energy certificates or RECs on the IEX, which commands roughly 80% market share, doubled in July with more than 72,300 non-solar certificates changing hands. "This trading session witnessed increased volumes of traded RECs over the previous months with the trade of 72,321 non-solar and 1,983 solar RECs," IEX said in a statement on July 31. In June, 36,147 non-solar and 797 solar RECs were traded. One REC is equivalent to 1 mega watt for every hour of energy generated from renewable sources.

The trading session for RECs in July featured 770 market participants and of them, 610 entities participated in the non-solar segment. Power traded on the exchange rose to 2.6 billion units in June from 2.3 billion units in May as a delayed monsoon saw mercury levels shooting up in many parts of the country, leading to a surge in demand. The daily average cleared volume in June rose to 87 million units, up from 76 million units traded in May.

IEX was started by Financial Technologies group founder Jignesh Shah, under investigation for the National Spot Exchange Ltd payment crisis. It's now owned by private equity funds such as Multiples Alternate Asset Management, Bessemer Venture Partners, Light speed Venture Partners, India Value Fund and state-government companies including Power Trading Corp. and Rural Electrification Corp. Indian power companies Adani Enterprises, Jindal Power, Lanco Infra, Reliance Infra and Tata Power together own a 5% stake in the exchange.

Courtesy: Economic Times

CONTRIBUTION TO NEWSLETTER (Rs.1,000/- per year)

- 134. Karthik Electricals, (2014-15)
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- 135. Padma Electricals, (2013-15)
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- 137. Circuit Engineering, (2013-15)
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- 158. Sharon Electricals, (2014-15)
- 159. R.S Windtech Engineers P. Ltd, (2014-15)
- 160. Gopi Electricals, (2012-14)
- 161. R.J. Enterprises, (2014-15)

We request other members also to send their contribution for NEWSLETTER early.

(Please help us to serve you better)

IBM RESEARCH LAUNCHES GREEN HORIZON IN CHINA

IBM has launched a 10-year research initiative to support China in transforming its national energy systems.

Dubbed “Green Horizon,” the project sets out to leap beyond current global practices in three areas critical to China’s sustainable growth: renewable energy forecasting, energy optimization for industry and air quality management.

Led by IBM’s China Research laboratory, the initiative will tap into the company’s network of 12 global research labs and create an innovation ecosystem of partners from government, academia, industry and private enterprise.



Renewable energy forecasting

The Chinese government recently announced increased investment in solar, wind, hydro and biomass energy in a bid to decrease its dependency on fossil fuels. To support the objective, IBM has developed a renewable energy forecasting system to help energy grids harness and manage alternative energy sources.

The solution combines weather prediction and Big Data analytics to accurately forecast the availability of renewable energy, which can be extremely variable. It enables utility companies to forecast the amount of energy that will be available to be redirected into the grid or stored, helping to ensure that as little as possible is wasted.

IBM says the system increases the viability of renewable energy, helping the Chinese government to realize its objective of getting 13% of consumed energy from non-fossil fuels by 2017 and enabling the construction of the world’s biggest renewable grids.

Based on IBM’s Hybrid Renewable Energy Forecasting (HyRef) technology, the solution uses weather modeling capabilities, advanced cloud imaging technology and sky-facing cameras to track cloud movements, while sensors monitor wind speed, temperature and direction. It can predict the performance of individual renewable energy farms and estimate the amount of energy several days ahead.

The system has already been rolled out to 30 solar, wind and hydro power sources. The biggest deployment is at China’s largest renewable energy initiative - the Zhangbei Demonstration Project managed by State Grid Jibei Electricity Power Company Limited (SG-JBEPC) in the Northern province of Hebei. Using the system, SG-JBEPC is able to integrate 10% more alternative energy (enough for 14,000 homes) into the national grid. With a prediction accuracy of 90% proven on Zhangbei’s wind turbines, it is one of the most accurate energy forecasting systems in the world.

“Applying analytics and harnessing big data will allow utilities to tackle the intermittent nature of renewable energy and forecast power production from solar and wind, in a way that has never been done before,” said Brad Gammons, general manager of IBM’s Global Energy and Utilities Industry. “We have developed an intelligent system that combines weather and power forecasting to increase system availability and optimize power grid performance”.

Energy optimization for industry

To support China’s goal to reduce its “carbon intensity” by 40-45% by 2020, compared with 2005 levels (equivalent to 130 million tons of coal per year), IBM is developing a new system to help monitor, manage and optimize the energy consumption of industrial enterprises – representing over 70% of China’s total energy consumption.

Using a Big Data and analytics platform deployed over the cloud, it will analyze vast amounts of data generated by energy monitoring devices and identify opportunities for conservation. It could be used to analyze data from industrial enterprises in different cities and identify which sites and equipment waste the most energy.

The new energy optimization system for industry leverages IBM’s expertise in regional energy management in China. IBM is already engaged with China Southern Grid to manage the energy consumption of HengQin Island in Guangdong province helping the island to decrease energy consumption, costs and CO₂ emissions.

Urban air quality management

The Beijing Municipal Government has become one of the first partners to join the project, agreeing to work with IBM to develop solutions for the city’s air pollution problems.

“China has made great achievements and contributed much to the world’s economic growth over the past 30 years,” said D.C. Chien, chairman and CEO of IBM Greater China Group. “It now has an opportunity to lead the world in sustainable energy and environmental management. While other nations waited until their economies

were fully developed before taking comprehensive action to address environmental issues, China can leverage IBM's most advanced information technologies to help transform its energy infrastructures in parallel with its growth."

The resulting environmental impact of China's immense economic growth over the past several decades, particularly air pollution, has become a priority for the Chinese government.

"The key to tackling environmental problems is not only monitoring emissions but adopting a comprehensive approach to air quality management and addressing the issues at their roots," said Lu Qiang, professor at Tsinghua University and Fellow of the Chinese Academy of Sciences. "Initiatives like IBM's Green Horizon can help by fostering joint innovation across the entire energy value chain".

The city of Beijing will invest over \$160 billion to improve air quality and deliver on its target of reducing harmful fine Particulate Matter (PM 2.5) particles by 25% by 2017. To support the initiative, IBM is partnering with the Beijing Municipal Government on a system to enable authorities to pinpoint the type, source and level of emissions and predict air quality in the city.

IBM's cognitive computing systems will analyze and learn from streams of real-time data generated by air quality monitoring stations, meteorological satellites and IBM's new-generation optical sensors - all connected by the internet of things. By applying supercomputing processing power, scientists from IBM and the Beijing government aim to create visual maps showing the source and dispersion of pollutants across Beijing 72 hours in advance with street-scale resolution.

Read more: http://www.pv-magazine.com/news/details/beitrag/ibm-research-launches-green-horizon-in-china_100015637/#ixzz38jUKEPWh

WIND POWER CAPACITY SET TO RISE AFTER FM'S INCENTIVE

In a move that will boost the **wind** power market in **India**, finance minister Arun Jaitley has said that the Accelerated Depreciation Scheme would be restored for the **wind** industry. Under the scheme, companies which put up **windmills** can write off 80% of the project costs as depreciation in the first year of putting up the **windmill**, and thus save taxes.

The scheme launched in the 1990s was withdrawn in 2012, leading to a major fall in capacity additions of **wind** power in **India**. Across **India**, and in Tamil Nadu particularly, which is the state with the highest capacity of **windmills**, the AD scheme is what drove the **wind** power movement as several companies like textile mills had put up **windmills** to save taxes and also generate **wind** power for their own use.



Once the reinstatement of the scheme is officially notified, **wind** power generation would increase by 1, 000 MW resulting from an additional Rs 7,000 crore investment in the sector.

"The industry was expecting to add about 2, 000 megawatt (MW) **wind** capacity this year and this would result in an additional 1, 000 MW of capacity across the country," said, Madhusudan Khemka, MD, Regen Power Tech, and chairman of the **Indian** Wind Turbine Manufacturers Association. About 1, 700 MW of **wind** capacity was added in 2013, down from 2, 300 MW in 2012. "About 800 MW would come in by the end of this year, most of it in the captive consumption space, and there is sufficient manufacturing capacity to meet this increase in demand," Ramesh Kymal, said CMD of **wind** turbine maker Gamesa **India**.

"Tamil Nadu alone has the capacity to take an additional 7, 000 MW as per our feasibility studies. Land is available and **wind** flows are high so a lot of our members would add capacity this year," said K Venkatachalam, chief adviser of Tamil Nadu Spinning Mills Association, which owns 3, 000 MW of **windmills** in the state. The availability of transmission lines continues to be an issue, but the commissioning of a transmission line from southern Tamil Nadu to Chennai will help improve the situation, companies say.

IBC SOLAR BEGINS CONSTRUCTION OF 5.5 MW SOLAR PLANT IN RAJASTHAN

German PV manufacturer and developer, IBC Solar has begun construction of a 5.5MW solar power plant in Rajasthan, India.



IBC Solar is to deliver engineering, procurement, and construction (EPC), using its local subsidiary to develop the proposed solar power plant. Completion of the project is expected in June 2014.

The plant is to be located in Bhadla, in the district of Jodhpur, in leading solar state Rajasthan.

The solar power plant is being constructed on government land of 10,000 hectares, which has been leased to investors as part of the 'Invest Rajasthan' initiative; the land is to be used solely for solar projects.

IBC Solar has said the chosen location for the plant will be "topographically and logistically demanding" due to a low rainfall climate. IBC Solar said it used "under-reamed fundamentals" to tackle the issue of loose sand foundations, and decentralised inverters will be installed to utilise shade and protection provided by the panels, from the desert climate.

Due to the remote location, the government of Rajasthan is also installing a grid substation to receive energy generated by the plant.

Reinhard Ling, business manager at IBC Solar in Mumbai said to "ensure an effective transfer of knowledge, especially in emerging markets like India" IBC Solar is also "including as many local workers and specialists as possible in the construction phase in Bhadla".

Rajasthan has 300-330 sunny days a year and is already leading India's national solar mission with giga-watt, 'mega' solar power plants planned for construction.

IBC Solar already has five completed solar projects in India, totalling 18MW.

Courtesy: PV tech

"Anti-intellectualism has been a constant thread winding its way through our political and cultural life, nurtured by the false notion that democracy means that 'my ignorance is just as good as your knowledge.'" - ISAAC ASIMOV

INDIA PLEDGES \$250 MILLION TO GRID IMPROVEMENTS, SOLAR POWER

India recently committed millions of dollars to solar power and grid improvements in an effort to provide electricity to more homes, according to *Bloomberg*.

Prime Minister Narendra Modi's government will spend 15 billion rupees (US\$ 250 million) to increase solar power across the country and also to improve power delivery. Nearly 40 percent of India's 1.2 billion people have no access to reliable electricity.

Two-thirds of the funds would go to various types of solar power projects. About \$83 million would go to large solar power plants, and another \$67 million would go towards 100,000 solar-powered irrigation pumps.

The investment in the pumps is just a fraction of the 26 million groundwater pumps that the Indian government wants to replace with more efficient solar-powered pumps. The power used for pumping irrigation water is also one of the largest strains on the Indian power grid. Earlier this year, *Bloomberg* reported the cost of 200 000 pumps would be \$1.6 billion.

The government also recommitted to providing 24/7 power supply to all homes with an \$83 million investment in feeder systems to bring electricity to rural areas. The program would mirror one that Modi instituted in its home state of Gujarat, according to *Bloomberg*.

In Gujarat, power feeder lines for farmers, which have substantial power needs, were separated from those that go to homes and villages. That allowed the state to provide more reliable electricity to most areas while also limiting the amount of subsidized power provided to farmers.

Some industry analysts question whether the budget allocation for this project would make a significant impact. Kameswara Rao, head of energy, utilities, and mining in India for PricewaterhouseCoopers LLP told *Bloomberg* that the funding needed to split off rural electricity supply was far larger than budgeted.

The efforts "are directionally correct but involve relatively small steps or lack specifics to support a meaningful improvement in the short-term," credit rating agency Fitch Ratings said of the investment for India's power sector. "There are entrenched structural issues affecting the performance of the power sector of India and the solution would require a sustained and disciplined policy focus".

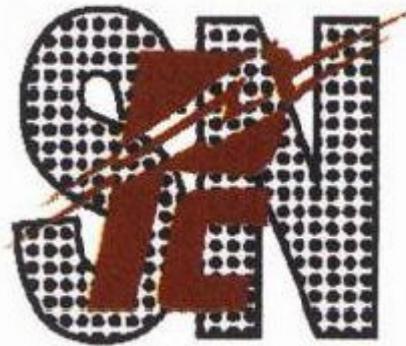
While India's power sector suffers from an inadequate grid, there are also generation shortfalls that will not be helped by the funds committed to solar power and distribution upgrades. Fitch Ratings notes that there is a domestic shortfall for both coal and gas for power plants.

"The entire ecosystem of the power sector - from generation to distribution - needs to be strengthened," Fitch analysts wrote.

Environmentalists were not pleased with the budget, calling for more distributed generation, rather than investment in large-scale solar plants and a continued reliance on coal that is fed into an inefficient grid.

"The steps on renewable energy and energy efficiency are not transformational," Vinuta Gopal, head of climate and energy at Greenpeace India, told *Reuters*, "and the attempt to force fit coal production to clear the irrational power proposals is a signal that the reality of climate change has far from been recognized by this government".





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USGBC ANNOUNCES EXPANDED SUPPORT FOR LEED GREEN BUILDING PROGRAM IN INDIA

India Third on List of Countries in the World with Most LEED-Certified Space

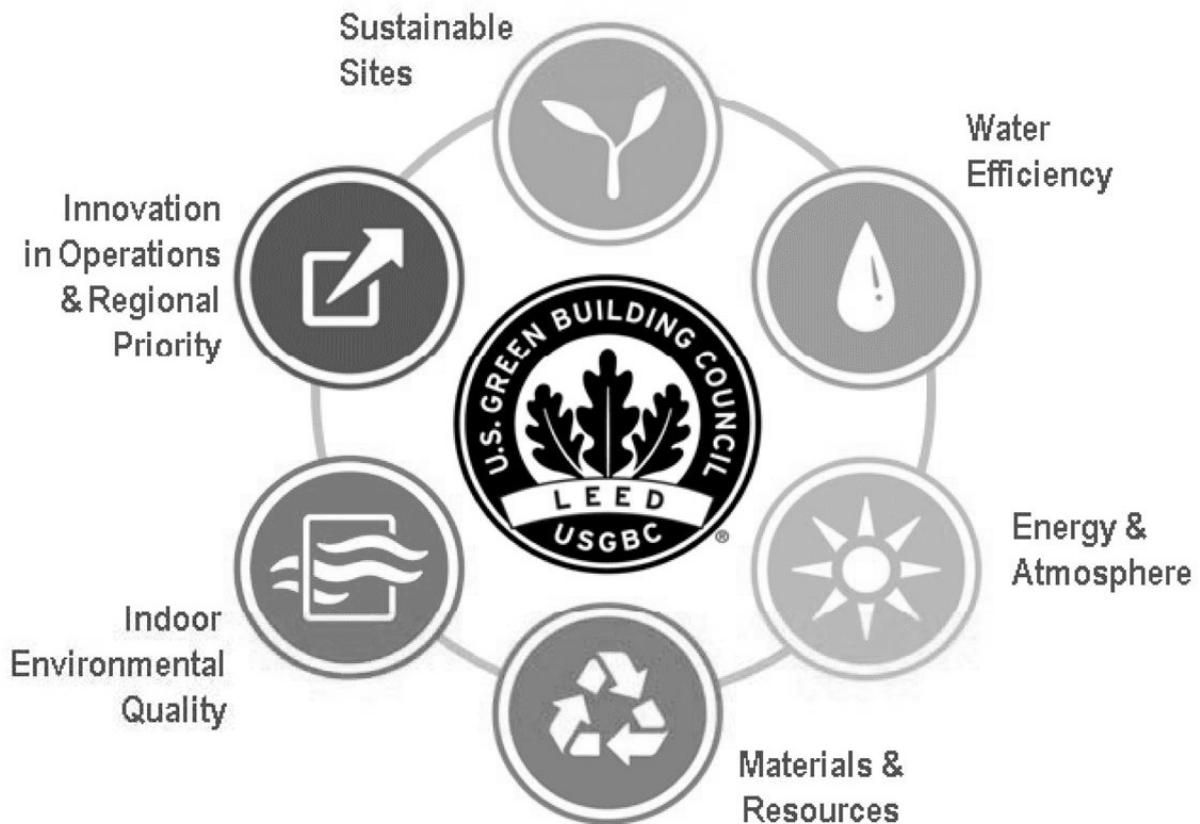
New Delhi — (5 June 2014) — The U.S. Green Building Council (USGBC), the creator and administrator of LEED, announced today it was expanding its support of LEED (Leadership in Energy and Environmental Design), the popular global green building program, in India.

“The uptake of LEED across the globe has been extraordinary”, said Rick Fedrizzi, president, CEO and founding chair, USGBC. “Because LEED buildings save energy, water and precious resources, they are our first line of defense in the worldwide fight to slow the impacts of climate change and promote wellness. The multinational architectural, engineering and construction companies that are leading the building boom around the world were early adopters of LEED in the U.S., and they are now applying LEED’s principles and benefits in more than 150 countries. USGBC wants to provide significant support that can underpin this strong growth”.

India ranks third globally for countries outside of the U.S. with the most LEED-certified space, with nearly 12 million square meters, according to a report released by USGBC last month.



LEED Credit Categories



Fedrizzi outlined four key initiatives that have been launched:

1) LEED is evolving to be a truly global rating system by providing local and regional paths for projects to achieve certification. These alternative compliance paths take into account regional climate, geography, land use laws

and more. India will now have a seat at the LEED International Roundtable, the USGBC group responsible for driving the international development and applications of LEED.

2) In an effort to strengthen global consistency of the LEED rating system, the Green Building Certification Institute (GBCI) will now manage certification of projects to all LEED rating systems in India, including assuming responsibility for LEED India certification from the Indian Green Building Council (IGBC). IGBC will continue to provide support to LEED India projects already in the system, but all new projects will come under the auspices of GBCI for certification services.

3) With this move, the entire suite of LEED rating systems will now be available in India, including LEED v4, the latest update to the rating system that codifies performance goals through a continuing relationship with LEED throughout the life cycle of the building.

4) To support this increase in the LEED offerings in India, USGBC is establishing a hub in New Delhi to provide in-country support to LEED project teams, including education, technical support and customer service.

“We want to meet our customers where they are and provide local and regional support that makes the continuing use of LEED seamless,” said Mahesh Ramanujam, chief operating officer, USGBC. “In addition to our own staff, we are significantly expanding our relationships in the region with other global organizations and service providers with whom we can explore the joint development and promotion of education and events, such as manuals and training modules, workshops and design charrettes, meetings, and conferences. We’re also looking to collaborate around green schools, resilient communities, affordable housing and human health issues in LEED to help support our vision of green buildings for everyone within a generation”.

Ramanujam noted that India has a leadership role in the efforts to transform the built environment into one that enhances the quality of life for all its citizens. “High performing buildings should be a mark of pride for India. With my home country’s new forward-looking leadership under Prime Minister Shri Narendra Modi, who has made sustainability a key value of his new administration, we are excited for LEED to play a key role in supporting that vision”.

LEED is the world’s most widely used and recognized rating system guiding the design, construction, operations and maintenance of green buildings. To date, project teams in more than 150 countries and territories have implemented LEED in their building projects, taking advantage of its global, regional and local applicability to create structures that mitigate greenhouse gas emissions; create healthier indoor environments for workers, students and community members; and lower utility bills for building owners through reduced energy and water use.

About LEED

The U.S. Green Building Council’s LEED (Leadership in Energy and Environmental Design) green building certification system is the world’s foremost program for the design, construction, maintenance and operations of green buildings. Every day, 1.7 million square feet (158,000 square meters) of space is certified using LEED in more than 150 countries and territories. LEED seeks to optimize the use of natural resources, promote regenerative and restorative strategies, maximize the positive and minimize the negative environmental and human health consequences of the construction industry, and provide high-quality indoor environments for building occupants. In addition, more than 56,000 residential units have been certified under the LEED for Homes rating system, with more than 90,000 more homes registered. Learn more at USGBC.org/LEED and review the Foundations of LEED development process.

About GBCI

The Green Building Certification Institute (GBCI) is a third-party organization that provides independent oversight of professional credentialing and project certification programs related to green building. GBCI is committed to ensuring precision in the design, development, and implementation of measurement processes for green building performance (through project certification) and green building practice (through professional credentials and certificates). Established in 2008 to administer certifications and professional designations within the framework of the U.S. Green Building Council’s LEED® Green Building Rating Systems™, GBCI continues to develop new programs and offer the marketplace validation that building certifications and professional designations have met specific, rigorous criteria. Learn more at GBCI.org.

About the U.S. Green Building Council

The U.S. Green Building Council (USGBC) is committed to a prosperous and sustainable future through cost-efficient and energy-saving green buildings. USGBC works toward its mission of market transformation through its LEED green building program, robust educational offerings, a nationwide network of chapters and affiliates, the annual Greenbuild International Conference & Expo, the Center for Green Schools and advocacy in support of public policy that encourages and enables green buildings and communities.

WIND FARM FIRES FAR MORE COMMON THAN REPORTED, STUDY FINDS

Fires in wind turbines are happening ten times more often than they are reported, according to new research from Imperial College London, the University of Edinburgh and SP Technical Research Institute of Sweden. The incidence of fire is still far less than in fossil fuel-based energy industries, such as oil and gas, which suffer thousands of fire accidents per year. The wind industry reports about 11 fires per year, but the researchers found there are more likely about



117 wind turbine fires annually across more than 200,000 turbines. For the wind industry, the fires are the second leading cause of accidents after blade failure.

Inside of the turbine's nacelle, hydraulic oil and plastics share the same tight space as machinery and electrical wires. When there is overheating or faulty wiring it can catch fire. The nacelles are perched behind the turbines so high winds often fuel the flames.

Because the turbines are so tall and are often in remote areas, they are usually destroyed before the fire can be suppressed. In 90 percent of the cases, the fire leads to substantial downtime or a total loss of the wind turbine. "Worryingly our report shows that fire may be a bigger problem than what is currently reported," Guillermo Rein, from the department of mechanical engineering at Imperial College London, said in a statement. "Our research outlines a number of strategies that can be adopted by the industry to make these turbines safer and more fire resistant in the future".

The researchers looked at data from the past 30 years and found that fire accounted for 10 to 30 percent of the reported turbine accidents, with reports increasing. The leading cause of the fires was lightning strikes. That was followed by electrical malfunction, mechanical failure, and errors with maintenance.

One industry group, Renewable UK, welcomed the report overall but questioned the data sources used by the researchers. "Wind turbines are designed to international standards to meet mandatory health and safety standards including fire safety risks. State of the art monitoring systems ensure that the vast majority of turbine fires can be dealt with quickly and effectively," Chris Streatfeild, director of health and safety for Renewable UK, said in a statement. "This is supported by an HSE-commissioned report in 2013, which concluded that the safety risks associated with wind turbines are well below all other comparable societal risks".

Some of the strategies the researchers suggest to prevent ignition include passive fire protections, such as lightning protection systems and switching to non-combustible oils and insulating materials. Smoke alarms and fire suppression systems could also help minimize the extent of fire damage.

The researchers also plan to evaluate the frequency and impact of fire on solar panels in the future.

Action expresses priorities. – MAHATMA GANDHI

NATIONAL SOLAR MISSION BACK WITH A BANG

After facing delays, trade disputes and industry tiffs, the Jawaharlal Nehru National Solar Mission (JNNSM) appears to be back on track.

The ministry of new and renewable energy (MNRE) has issued guidelines for setting up 1,500 Mw of solar power plants, the largest tender issued till now. It has also roped in NTPC Vidyut Vyapar Nigam (NVVN) to expedite the phase and meet the mission's targets.



NVVN would also bundle the solar power generated with cheaper conventional power and sell at an average rate.

“The selection of grid-connected solar photovoltaic (PV) projects of 1,500 Mw total capacity shall be carried out by NVVN through a transparent, tariff (rate)-based reverse bidding process. NVVN will purchase the power from the successful developers at their bid tariff and sell bundled power to distribution companies/utilities/other bulk consumers,” say the guidelines issued by MNRE.

NVVN is the trading arm of the nation's largest thermal power producer, NTPC. It was responsible for carrying out the very first bidding of the JNNSM, in 2010.

That helped the solar power rates go down from Rs 17 a unit to Rs 10-12 a unit. Subsequently, the cost of solar power has come down to Rs 6.5-7 a unit, a 60 per cent decline in three years. The previous batch of bids under JNNSM had a fixed rate of Rs 5.45 a unit, supported with viability gap funding.

“We are hopeful that during this bidding, the rate would come down to at least Rs 5 a unit. There are now serious players in the sector, expected to bid aggressively,” said Tarun Kapoor, joint secretary, MNRE. He said the tender process would take off as soon as consultations with the stakeholders concluded, most likely by the end of August.

The government is also hopeful of achieving grid parity that is solar power at the same cost as conventional power, by 2017, scaling down from the earlier target of 2022.

The mission guideline has divided the phase target in two portions. “In order to avoid the difficulty that may arise in achieving financial closure of projects, selection of PV projects shall be done in a phased manner. The total capacity of solar PV projects to be selected in the first tranche, in FY2014-15, will be 750 Mw. The projects for the remaining capacity of 50 Mw for solar PV projects will be selected in the second tranche, that is, in FY2015-16,” say the guidelines.

The second phase of JNNSM got delayed by more than a year, due to a dispute at the World Trade Organization over the Mission's domestic content requirement guidelines and dumping charges by **Indian** manufacturers on solar cells from China, US, Malaysia and Taiwan.

This batch of tender has also put aside as much as 500 Mw to be built from domestic content. The current capacity of the domestic industry is 1,260 Mw, of which 240 Mw is operational.

The bidding, part of the second batch of phase-II of JNNSM, aims to achieve a capacity addition of 10,000 Mw by 2017. The government tendered 750 Mw of projects this January, as a part of this phase. In the first phase, it achieved a capacity addition of 1,100 Mw. The country's current solar power capacity is 2,600 Mw and the government hopes to cross 20,000 Mw by 2022.

Source: Business Standards

PRODUCT OF THE MONTH

FLIR VS70 VIDEOSCOPE

The FLIR VS70 is a rugged, waterproof and shock-resistant videoscope that features intuitive handset controls that enable users to maneuver the narrow camera probe into tight spaces to deliver vivid and sharp video and images to a large 5.7" color LCD display. Advanced inspection solutions, expansion cameras, and add-on accessories enable users to expand their FLIR VS70 to address many different inspection needs.

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- Record video and images that transfer to a PC via SD card or USB port
- Voice annotate video recordings to add critical details with included headset
- Extended battery life accommodates a full day of inspections without recharging
- USB-based charging system enables users to charge at home, on the road, or at the job site.
- Base system is also available with a wide range of handsets, camera probes, and wireless options
- Includes: Hard case, user manual, power adapter, headset, car charger, shoulder strap, camera cleaning kit



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Display size	5.7in (135mm)
Battery life	6 to 8hrs (integrated)
Frame rate	30fps (NTSC & PAL)
Video / image transfer	SD Card or USB
Camera diameter range*	3.9mm to 28mm
Camera focal length options*	Long view or short view macro
Camera length range*	0.3m to 30m
Certifications	FCC
Warranty	2 years

“Justice and power must be brought together, so that whatever is just may be powerful, and whatever is powerful may be just.”- BLAISE PASCAL

NEWSLETTER - 100th ISSUE PHOTOS



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Gathering

SEMINAR PHOTOS ON "NATIONAL ELECTRICAL CODE OF INDIA 2011"



Welcome Address by **Mr. Amol Kalsekar**, ICAI; *Left to Right*: **Mr. Manas Kundu**, ICAI; **Mr. B.S. Reddy** – Supdt Engineer (E) – Chennai Central Electrical Circle –II , CPWD. Ministry of Urban Development, Government of India; **Er. S. Appavoo**, CEIG; **Mr. C.M. Singe** – Scientist – E (Electro technical Department) Bureau of Indian Standards (BIS), Ministry of Consumer Affairs, Government of India; **Mr. U. Baskaran**, *President*, TNEIEA



Keynote address by **Er. S. Appavoo**, CEIG



Group Photo



Gathering



Gathering

OPTIMIZATION OF AIR INSULATION CLEARANCES FOR EHV /UHV TRANSMISSION LINES - 2

5.0 OPTIMIZATION OF CONDUCTOR WINDOW AIR INSULATION CLEARANCES FOR 1200 kV TEST STATION AT BINA OF POWER GRID [10]

Studies on switching surge flashover characteristics of long insulators strings and their equivalent air-gaps, the results of which are essential for the coordination of EHV and UHV transmission systems, have been carried out. A study on optimization of conductor-tower air insulation clearances for adoption in 1200 kV AC transmission lines using 8 bersimis conductor bundle was also carried out for establishment of 1200 kV Test Station at BINA, Madhya Pradesh, by Power Grid Corporation of India.

TABLE 3:- OVERALL TOWER WINDOW CLEARANCES

System voltage (kV)	Type of string	Minimum window clearances (m)						
		With 1.75 pu		With BSL		With contingency of one arm snapping (m)	Existing tower clearance (m)	
		Tower top*	Tower side	Tower top*	Tower side			
400	I	–	3.04	–	4.30	–	4.7	4.3
	V	3.00	2.00	3.00	3.00	3.30	4.3	4.3
800	I	Not really used as independent string-only pilot strings used						
	V	5.30	4.75	5.30	6.75	5.90	5.1	5.3
1200	V	7.20	5.10	7.20	8.75	7.92	–	–

* Tower top clearance is a function of string length

The assembly area for carrying out the proposed study called Mock up test tower facility comprises of two dead end towers each of 48 m height and 20 m width and located 80 m apart. These two towers are used to tension the required conductor configuration along with insulator strings on either ends of the conductor bundle. The facility is provided with motorized winches to tension the required conductor. A Central portal tower, of 60 m height, is located centrally between the two dead towers and has a width of 48 m between the legs. This central portal is also provided with motorized winches and is used to suspend different tower simulations at any desired height. A view of this facility is shown in Figure 9. The tower top, tower side and tower window as required at various stages of the tests were simulated in the central portal tower by aluminum sections having dimensions similar to those obtained in 1200 kV suspension tower design.

The studies included determination of critical time to peak (T_{cr}) for switching impulse wave shapes corresponding to conductor to tower air gap clearance of 7 m and 10 m. Only the tower top and one tower side was simulated for above purpose as shown in Figure 10. 50 % Flashover voltage corrected for atmospheric conditions plotted as a function of T_p for the gap distances 7 m and 10m for tower top and one side simulation is given in Figure 11. It can be observed from the Figure that the critical time to peak for which the CFO occurs is between 220 to 230 microseconds. 50 % Flashover voltage at standard peak time of 250 μ s is little higher than the critical flashover voltage value. 50 % Switching flashover voltage corresponding to T_{cr} was then obtained for air gap distances of 7 m, 8 m, 9 m and 10m. The results obtained for CFO corresponding to the obtained T_{cr} of 220 μ s are tabulated in Table 4.

It can be observed from the results that for the CFO value of 2090 kVp seems to be very high even for 7 m air gap clearance for the tower top and side simulation. The withstand voltage determined as $U_{10} = U_{50} (1-1.3\sigma)$, even for $\sigma = 0.06$, will be 1927 kVp, which is much higher than the required switching impulse withstand voltage of 1800 kVp. However, for the tower configurations comprising insulators and associated hardware, this will not be the case because of the change in



Fig.9: A view of mock up test facility showing two and the divider dead end and central portal tower

gap configuration leading to different values of T_{cr} and CFO. Since the obtained CFO even for the lowest air gap of 7 m was quite high compared to targeted CFO corresponding to a withstand value of 1800 kV peak, it was decided to conduct the 50 % switching flashover test along with complete tower top as well as insulator string with hardware for 8 m and 8.5 m live-metal distance to tower. The insulators used were polymeric insulators forming the configuration as given in Figure 12. As the setup included the insulators and tower window, the critical time to crest T_{cr} for which CFO voltage occurs will be different from what is obtained before. The arrangement of the total setup with bundle conductor along with insulator string and tower window simulation is shown in the photograph given in Figure 12. For this test setup and with 8 m and 8.5 m air gap clearance, CFO voltages are therefore obtained for optimizing the air gap clearances. The setup was arranged for minimum gap clearances of 8 m from corona ring on line end to tower top and conductor to either side of the tower window. The conductor was strung at a height of 23 m above ground. Bottom simulation of the tower window was simulated at 11.5 m below the conductor and distance between the bottom window and the ground was 11.5 m. During the test, flashovers were evenly observed to the top, Insulator string and two sides of the window simulation. 50 % Flashover voltage corrected for atmospheric conditions plotted as a function of T_p for the gap distances 8 m and 8.5 m conductor-insulator string-tower window configuration to determine the critical time T_{cr} for which CFO voltage is obtained is as shown in Figure 13. It can be observed from Figure 13 that T_{cr} is in the range of 250-290 μ s for which the flashover voltages were minimum.

Table 5 gives the results on 50 % flashover voltage values obtained for 8 m and 8.5 m for the wave shape corrected for ambient atmospheric conditions. It can be seen from Table 5 that for conductor-window clearance of 8 m, the CFO voltage obtained was 1906 kVp for which the withstand voltage determined as $U_{10} = U_{50}(1-1.3\sigma)$, for $\sigma = 0.03$ (instead of 0.06) will be 1832 kVp. This level is just about 1.75 % higher than the required 1800 kVp withstanding level. In order to ascertain the positive polarity switching impulse withstand voltage of 1800 kVp withstand voltage procedure with 15 impulses is followed. Fifteen positive polarity switching impulse voltage levels corrected for ambient atmospheric conditions corresponding to withstand voltage level of 1800 kVp were applied for the air gap clearance of 8 m. No flashovers were observed for the 15 impulses applied even though two flashovers were allowed out of 15 impulses in withstand test. The all-round gap clearance was reduced to 7.5 m and withstand voltage test was carried out. Fifteen positive polarity switching impulse voltages for test voltage 1800 kVp corrected for ambient atmospheric conditions were applied. Out of 15 impulses applied, four flashovers were observed for 7.5 m gap clearance giving very low withstand probability for 1800 kVp test voltage. Thus, air clearances of 8 m seems to be the optimized air clearances for tower window configuration in 1200 kV transmission lines with BSL requirement of 1800 kVp.

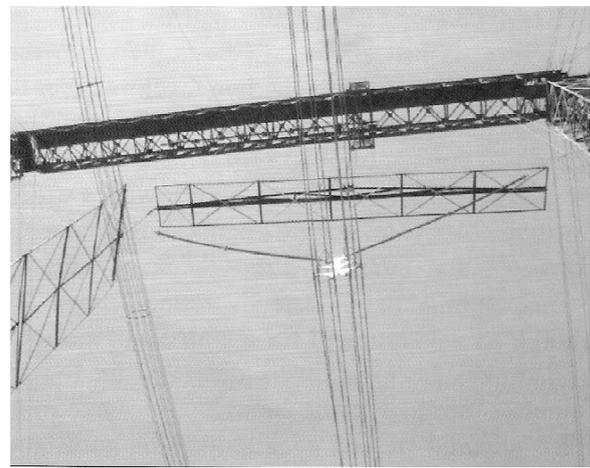


Fig.10: Set up for obtaining critical time to peak for switching impulse voltages

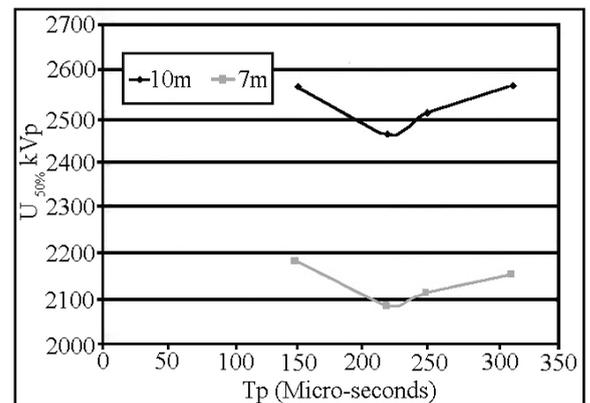


Fig.11: 50% flashover voltage corrected for atmospheric conditions plotted as a function of T_p for the gap distances 7 M and 10 M for tower top and one side simulation

TABLE 4:- SWITCHING CFO FOR VARIOUS AIR GAP DISTANCES WITH ONE SIDE AND TOWER TOP AND WITHOUT INSULATOR ASSEMBLY

Air gap distance (m)	Crest time (T_{cr})(μ s)	$U_{50\%}$ (CFO)(kVp)
7	220	2090
8	220	2225
9	220	2375
10	220	2463

Withstand voltage test with critical switching impulse voltage wave shape under wet conditions was carried out then for optimized air clearance of 8 m for the tower window along with the insulator string of dimensions considered in this study. Wetting procedure and resistivity of water used in test are as described in IEC60060-1 [6].

Fifteen positive polarities with critical wave shape switching impulse voltage levels but corrected for ambient atmospheric conditions corresponding to withstand voltage level of 1800 kVp under wet condition were applied. No flashovers were observed for the 15 impulses applied even though two flashovers were allowed out of 15 impulses in withstand test. Test was carried out with negative polarity switching impulse for the same voltage and wave shape. No flashover was observed for the configuration arranged. Thus, optimized air clearances of 8 m is found adequate under wet condition also for tower window configuration in 1200 kV transmission lines with BSL requirement of 1800 kVp.

6.0 CONCLUSIONS

An attempt has been made to obtain the tower window clearances for 400 kV, 800 kV and 1200 kV transmission lines. Comprehensive tests had been conducted and an approach for effective and economic tower designs for transmission lines up to 1200 kV lines has been established. The limited data presented in this paper can be considered as critical gap lengths for the various transmission system voltages presented.

Experimental work on optimization of conductor-tower air insulation clearances for adoption in 1200 kV AC transmission lines using 8 bersimis bundle conductor optimal window clearances of tower were intended to be arrived at for the Basic Switching impulse voltage Level of 1800 kVp required for the 1200 kV transmission lines. Positive polarity switching impulses are considered in the study as they give minimum flashover voltages.

Experiments to determine CFO voltages for Top and Side tower simulation were carried out for 10m and 7 m clearances and it is observed that the critical time to peak for which the CFO occurs is between 220 and 230 microseconds. For tower configurations comprising insulators and associated hardware lead to different values of T_{cr} and CFOs. Experiments to determine CFO voltages with insulators and Tower Window simulation were carried out for 8 m and 8.5 m all-round clearances. Critical time to peak (T_{cr}) in the range of 250-290 μ s was observed for which the flashover voltages were minimum. For window clearance of 8 m, the CFO voltage obtained was 1906 kVp. The withstand voltage determined as $U_{10}=U_{50}(1-1.3\sigma)$, for $\sigma = 0.03$ was 1832 kVp. Withstand voltage test procedure was adopted and 15 positive polarity switching impulse voltage levels corrected for ambient atmospheric conditions corresponding to withstand voltage level of 1800 kVp were applied for the air gap clearance of 8 m. The configuration successfully withstood 1800 kVp level. Withstand voltage test under wet conditions was carried out for optimized air clearance of 8 m. The configuration under study successfully withstood the wet test under both positive and negative polarities. Thus, air clearances of 8 m seem to be the optimized air clearances for conductor-tower window configuration in 1200 kV transmission lines with BSL requirement of 1800 kVp.

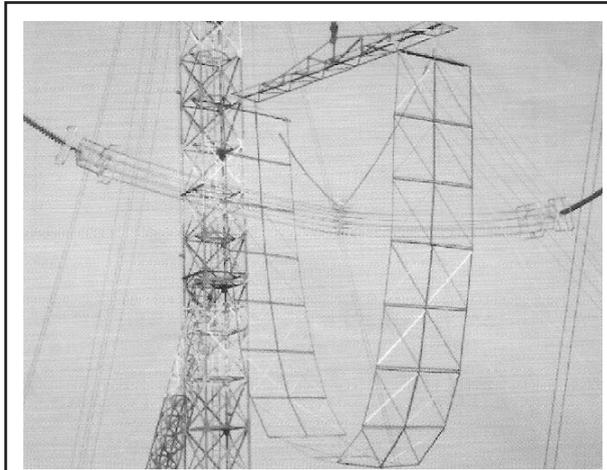


Fig.12: The arrangement of the total set up with bundle conductor along with insulator string and conductor-tower window simulation

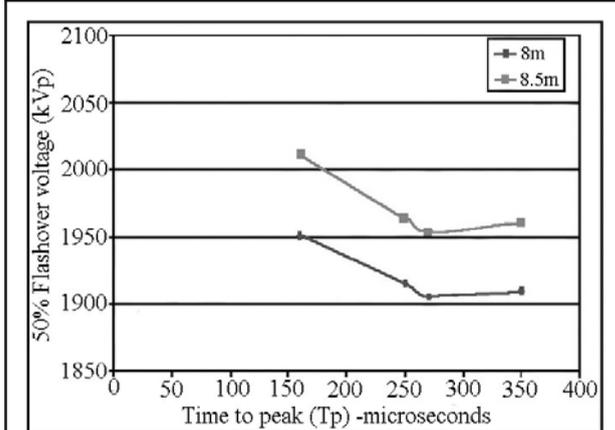


Fig.13: 50% flashover voltage corrected for atmospheric conditions plotted as a function of T_p for the gap distances 8 M and 8.5 M conductor-insulator string-tower window configuration

TABLE 5:- THE CFO OBTAINED FOR CRITICAL T_{CR} OF 270 MS FOR 8m AND 8.5m CLEARANCES

Air gap distance (m)	Crest time (T_p)(μ s)	$U_{50\%}$ (CFO)(kVp)
8	270	1906
8.5	270	1953

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Courtesy: Pradeep M Nirgude, Gunasekaran B and Shivakumara Aradhya R S, CPRI Journal



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RESEARCHERS CREATE MULTIFUNCTIONAL NANOPARTICLES FOR CHEAPER, CLEANER BIOFUEL

(Nanowerk News) The U.S. Department of Energy's Ames Laboratory has created a faster, cleaner biofuel refining technology that not only combines processes, it uses widely available materials to reduce costs.

Ames Laboratory scientists have developed a nanoparticle that is able to perform two processing functions at once for the production of green diesel, an alternative fuel created from the hydrogenation of oils from renewable feedstocks like algae.

The method is a departure from the established process of producing biodiesel, which is accomplished by reacting fats and oils with alcohols.

“Conventionally, when you are producing biodiesel from a feedstock that is rich in free fatty acids like microalgae oil, you must first separate the fatty acids that can ruin the effectiveness of the catalyst, and then you can perform the catalytic reactions that produce the fuel”, said Ames Lab scientist Igor Slowing. “By designing multifunctional nanoparticles and focusing on green diesel rather than biodiesel, we can combine multiple processes into one that is faster and cleaner”. Contrary to biodiesel, green diesel is produced by hydrogenation of fats and oils, and its chemical composition is very similar to that of petroleum-based diesel. Green diesel has many advantages over biodiesel, like being more stable and having a higher energy density.

An Ames Lab research group, which included Slowing, Kapil Kandel, Conerd Frederickson, Erica A. Smith, and Young-Jin Lee, first saw success using bi-functionalized mesostructured nanoparticles. These ordered porous particles contain amine groups that capture free fatty acids and nickel nanoparticles that catalyze the conversion of the acids into green diesel. Nickel has been researched widely in the scientific community because it is approximately 2000 times less expensive as an alternative to noble metals traditionally used in fatty acid hydrogenation, like platinum or palladium.

Creating a bi-functional nanoparticle also improved the resulting green diesel. Using nickel for the fuel conversion alone, the process resulted in too strong of a reaction, with hydrocarbon chains that had broken down. The process, called “cracking,” created a product that held less potential as a fuel.

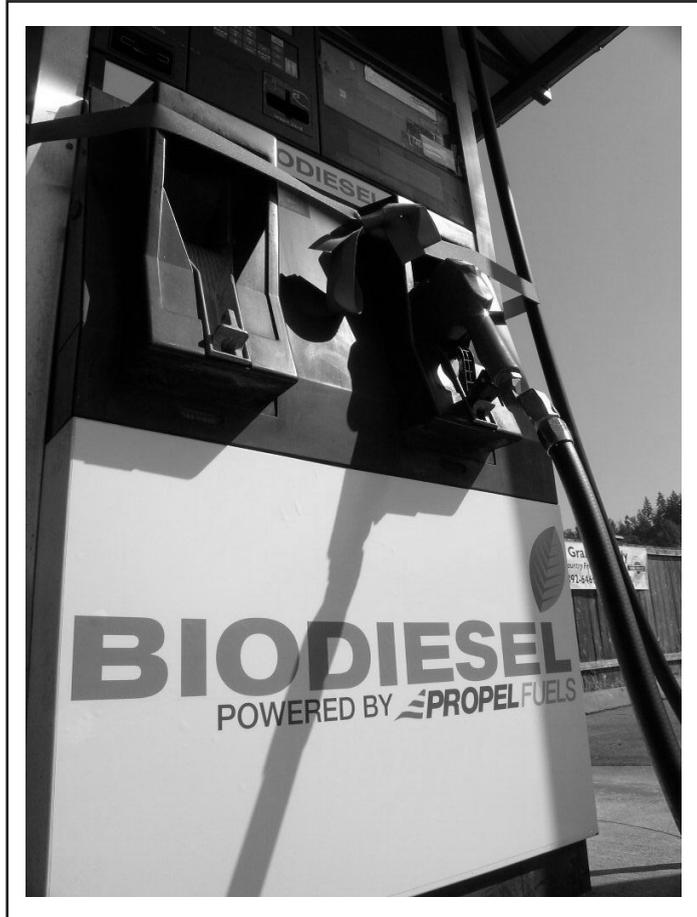
“A very interesting thing happened when we added the component responsible for the sequestration of the fatty acids,” said Slowing. “We no longer saw the cracking of molecules. So the result is a better catalyst that produces a hydrocarbon that looks much more like diesel”.

“It also leaves the other components of the oil behind, valuable molecules that have potential uses for the pharmaceutical and food industries,” said Slowing.

But Slowing, along with Kapil Kandel, James W. Anderegg, Nicholas C. Nelson, and Umesh Chaudhary, took the process further by using iron as the catalyst. Iron is 100 times cheaper than nickel. Using iron improved the end product even further, giving a faster conversion and also reducing the loss of CO₂ in the process.

“As part of the mission of the DOE, we are focused on researching the fundamental science necessary to create the process; but the resulting technology should in principle be scalable for industry”, he said.

Read more: Researchers create multifunctional nanoparticles for cheaper, cleaner biofuel
<http://www.nanowerk.com/nanotechnology-news/newsid=35543.php#ixzz35PrFFr21>



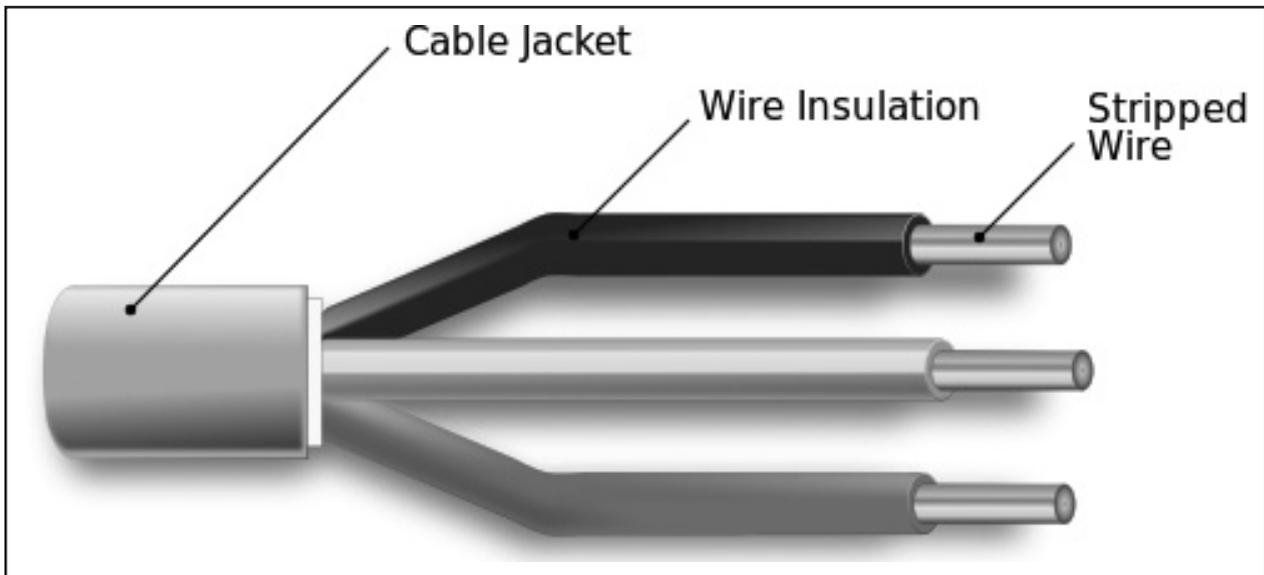
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TECHNOLOGY SERIES PART - 1/A

The Technology Series is planned to cover a brief History, Developments in Technology and the latest in of some of the important Components in the Power System.

POWER CABLES – Brief History

Compilation from general literature is presented below which will be followed by more on Developments and present scenario in coming issues.



The first power distribution system developed by Thomas Edison in 1882 in New York City used copper rods, wrapped in jute and placed in rigid pipes filled with a bituminous compound. Although vulcanized rubber had been patented by Charles Goodyear in 1844, it was not applied to cable insulation until the 1880s, when it was used for lighting circuits. Rubber-insulated cable was used for 11,000 volt circuits in 1897 installed for the Niagara Falls power project.

Mass-impregnated paper-insulated medium voltage cables were commercially practical by 1895. During World War II, several varieties of synthetic rubber and polyethylene insulation were applied to cables.

Modern power cables come in a variety of sizes, materials, and types, each particularly adapted to its uses. Large single insulated conductors are also sometimes called power cables in the industry.

Cables consist of three major components: conductors, insulation, protective jacket. The makeup of individual cables varies according to application. The construction and material are determined by three main factors:

- Working voltage, determining the thickness of the insulation;
- Current-carrying capacity, determining the cross-sectional size of the conductor(s);
- Environmental conditions such as temperature, water, chemical or sunlight exposure, and mechanical impact, determining the form and composition of the outer cable jacket.

Cables for direct burial or for exposed installations may also include metal armor in the form of wires spiralled around the cable, or a corrugated tape wrapped around it. The armor may be made of steel or aluminum, and although connected to earth ground is not intended to carry current during normal operation.

Power cables use stranded **copper** or **aluminum** conductors, although small power cables may use solid conductors.

The cable may include uninsulated conductors used for the circuit neutral or for ground (earth) connection.

The overall assembly may be round or flat. Non-conducting filler strands may be added to the assembly to maintain its shape. Special purpose power cables for overhead or vertical use may have additional elements such as steel or **Kevlar** structural supports.

Some power cables for outdoor overhead use may have no overall sheath. Other cables may have a plastic or metal sheath enclosing all the conductors. The materials for the sheath will be selected for resistance to water,

“Eat your food as your medicines. Otherwise you have to eat medicines as your food.”
- Best awarded words in London

oil, sunlight, underground conditions, chemical vapors, impact, or high temperatures. In nuclear industry applications the cable may have special requirements for ionizing radiation resistance. Cable materials may be specified not to produce large amounts of smoke if burned. Cables intended for underground use or direct burial in earth will have heavy plastic or metal, most often **lead** sheaths, or may require special **direct-buried** construction. When cables must run where exposed to mechanical impact damage, they may be protected with flexible steel tape or wire armor, which may also be covered by a water resistant jacket.

Higher voltages

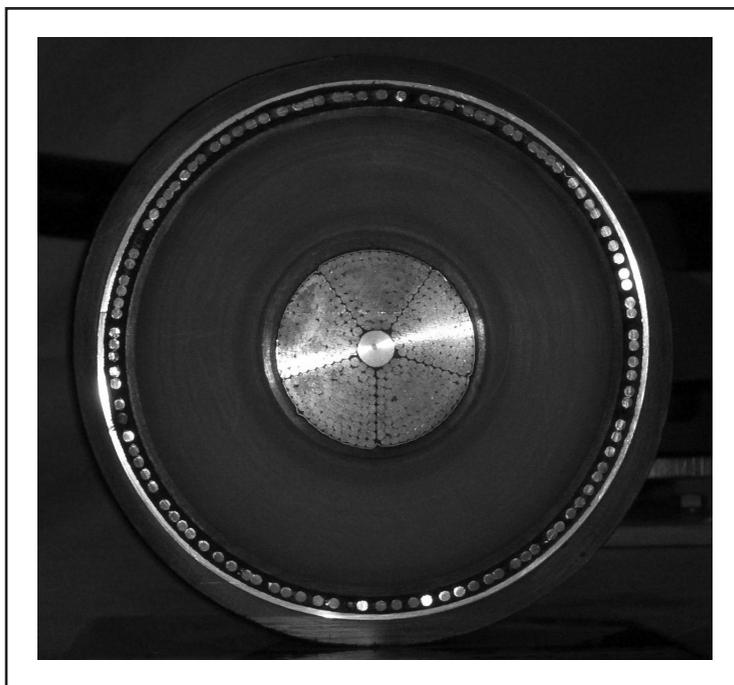
For circuits operating at or above 2,000 volts between conductors, a conductive shield may surround each insulated conductor. This equalizes electrical stress on the cable insulation. This technique was patented by Martin Hochstadter in 1916 and the shield is sometimes called a Hochstadter shield. The individual conductor shields of a cable are connected to earth ground at the ends of the cable, and at locations along the length if voltage rise during **faults** would be dangerous.

Cables for power distribution of 10 kV or higher may be insulated with oil and paper, and are run in a rigid steel pipe, semi-rigid aluminum or lead sheath. For higher voltages the oil may be kept under pressure to prevent formation of voids that would allow **partial discharges** within the cable insulation.

A high-voltage cable designed for 400 kV. The large conductor in the center carries the current, smaller conductors on the outside act as a shield to equalize the voltage stress in the thick polyethylene insulation layer.

Modern **high-voltage cables** use polymers or polyethylene, including **XLPE** for insulation. They require special techniques for jointing and terminating.

Many multiconductor cables have a bare or insulated *grounding* or *bonding* wire which is for connection to earth ground. The grounding conductor connects equipment enclosures to ground for protection from electric shock.



Electrical power cables are often installed in raceways, including **electrical conduit** and cable trays, which may contain one or more conductors.

A hybrid cable can include conductors for control signals or may also include **optical fibers** for data.

Flexible Cables

All electrical cables are somewhat flexible, allowing them to be shipped to installation sites wound on reels or drums. Where applications require a cable to be moved repeatedly, such as for portable equipment, more flexible cables called “cords” or “flex” are used. Flexible cords contain fine stranded conductors, not solid core conductors, and have insulation and sheaths to withstand the forces of repeated flexing and abrasion. Heavy duty flexible power cords such as those feeding a **mine face cutting machine** are carefully engineered — their life is measured in weeks. Very flexible power cables are used in automated machinery, **robotics**, and machine tools.

An X-ray cable is a special type of flexible **high-voltage** cable.

Vast expansion of distribution and electricity supply and growing environmental awareness are creating exciting new markets for power transmission solutions based on extruded cable technology. At the same time, improvements on all fronts are extending the use of XLPE (cross-linked polyethylene) insulated cable systems up to 500 kV. Today’s cable system applications are often competitive with overhead lines, while new manufacturing methods are enabling expansion of submarine cables with integrated optical fibers and flexible joints to be supplied in longer lengths than ever before. Further development of extruded insulation systems is also contributing to the success of innovative HVDC Light concept.



(To be continued)
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GE CLAIMS FUEL CELL BREAKTHROUGH, STARTS PILOT PRODUCTION

General Electric has developed a way to convert natural gas using a combination of fuel cell and an engine, an approach it hopes will finally result in broad adoption of stationary fuel cells.

The industrial giant's research arm on Tuesday disclosed details on its solid-oxide fuel cell research efforts and said it has started a pilot line at a factory in upstate New York to manufacture the generators. As first reported here last year, GE has achieved relatively high efficiency by coupling two generators and hopes to bring down costs by using cheaper materials.

Instead of using expensive platinum or other rare metals as catalysts, GE's fuel cell uses stainless steel, the company says. It generates electricity by flowing fuel through stacks of ceramic plates where a chemical reaction between the fuel and oxygen from incoming air occurs between a positive and negative electrode at high temperatures.

The core technical innovation lies in the ceramic plates, GE materials scientist Kristen Brosnan said in a statement. The anode and zirconium-oxide electrolyte layers are deposited using a thermal spray technology now used to protect parts inside GE jet engines. The cathode is a printable ceramic material GE developed. "Our materials are easy to apply, can handle large temperature swings and last a long time," says Brosnan.

GE engineers have also taken advantage of another generator in its product portfolio—its Jenbacher gas engine—to squeeze more electricity from the available fuel. The natural gas-to-electricity conversion produces exhaust gases, which contain a mixture of hydrogen and carbon. This synthetic gas, or syngas, is fed into the engine to produce additional power. Combined, GE estimates it can turn 65 percent of the usable energy from natural gas into electricity. Bloom Energy, which also makes a solid-oxide fuel cell, says its fuel cells are about 60 percent efficient. Using the waste heat from this process, GE thinks it can get to 95 percent energy efficiency.

In the U.S., there has been a surge in interest in distributed power generation and microgrids in the wake of Hurricane Sandy and other storms, which knocked out power for long periods of time. Fuel cells, which compete with micro-turbines and engines for distributed power, are considered reliable for baseload power generation but tend to be more expensive per kilowatt.

Improving the efficiency of power conversion is one way to make fuel cells more cost competitive with other sources of distributed power generation. The low cost of natural gas in the U.S, thanks to a drilling boom, is also making distributed generation more competitive compared to grid power.

Stationary fuel cells are already being used in places, such as wastewater treatment plants or commercial buildings that want a reliable source of power. eBay and Apple have both installed multi-megawatt fuel cells from Bloom Energy at their cutting-edge data centers. Some utilities, too, are experimenting with using distributed fuel cells to generate power locally rather than from central power plants.

For its part, GE is bullish on natural gas for distributed energy. Its research organization is developing a number of products, such as liquid and compressed natural gas fueling stations for vehicles and on-site power generation. Its fuel cells, which can generate between one megawatt and ten megawatts, could be used to power remote industrial sites, such as mining operations or drilling, and locations that lack the electric grid but have access to local natural gas sources.

At a commercial level, though, fuel-cell companies have tended to struggle financially. Earlier this week, for instance, fuel-cell maker Clear Edge Power, which had declared bankruptcy earlier this year, was bought by a South Korean conglomerate after failing to attract enough customers.

GE faces the same financial hurdles as other fuel cell companies but with its hybrid approach, can boast improved performance. And with its financial resources, it can continue to refine the technology and manufacturing over time and provide financing to customers who would rather pay for the power generated by fuel cells than purchase the equipment themselves.



INDIA READY WITH DRAFT POLICY TO REDUCE EMISSIONS FROM DEFORESTATION

Taking forward an agreed framework of the 2013 Warsaw climate conference, India has come out with a draft national policy on 'reducing emissions from deforestation and forest degradation' (popularly known as REDD+ initiative) which will enable local communities to get financial incentives for increasing forest cover.

The REDD+ initiative is a global mitigation mechanism under a UN body, linking deforestation, degradation, conservation of forest carbon stocks and sustainable management of forests with reduction of greenhouse gas emission.

It has provision of compensating developing countries for their efforts to increase forest cover under a result-based payment system. The money for this purpose is being collected through contributions from rich nations under the initiative.

Although only three countries - UK, Norway and US - have, so far, pledged money to the tune of 280 million dollars for financing the initiative, the move is seen as a step in the right direction as deforestation accounts for nearly 20% of global emissions of carbon dioxide.

In order to tap this source to improve its forest cover, India now intends to make the country REDD+ ready by creating a "national-level authority" and setting up "supportive institutions" in three years.

Keeping this deadline in mind, the Union ministry of environment and forest (MoEF) had on Monday come out with a draft national policy and sought suggestions from stakeholders and experts within a month (till May 27).

"Based on the comments of the stakeholders, the draft document will be finalized," said a ministry note.

It said the objective of this policy is to develop forest areas, safeguard rights and interests of local communities and to strengthen coordination among sectors and stakeholders having direct and indirect impact on land use and forestry.

"The objective is also to develop appropriate mechanism for channelizing REDD+ funding and transferring the accrued financial benefits to the communities in a fair, equitable and transparent manner", said the ministry.

Underlining importance of increasing forest cover, the ministry took note of the fact that the present level of forest cover in India (69.20 million hectares) neutralizes 11% of the country's greenhouse gas emissions.

According to Global Forest Resource Assessment (GFRA), India is at 10th position in terms of forest area in the world. As per India State of Forest Report, the total forest cover in the country is around 21.05% of the geographical area. The country had, however, added merely three million hectares of forest in 1997-2007.

Though REDD+ is a complex subject and is still evolving where finance is certainly an ambiguous area at present, India seeks to establish a robust institutional mechanism so that it can be benefited from this global initiative.

Setting up national forest monitoring system, national REDD+ architecture\governance and information system, building a critical mass of technical\institutional capacities of various stakeholders including local communities and evolving a domestic funding mechanism to increase forest cover in the country by involving PSUs and corporate sector under 'corporate social responsibility' are some of the key features of the draft policy.

MARUTHI SUZUKI – SOLAR INITIATIVE

Car market leader Maruti Suzuki India Ltd (MSI) has commissioned a solar power plant at its Manesar facility to harness renewable energy source in line with its policy of adopting eco-friendly technologies. The one mega watt solar power plant has been set up at an investment of Rs.10.3 crore and was commissioned this month, the company said in statement. Commenting on the initiative, MSI executive director, Rajiv Gandhi said, "With the launch of one mega watt photo voltaic solar power plant, Maruti Suzuki has taken the first step to harness renewable solar energy". "The initiative is in line with the Company's philosophy of adopting environment friendly technologies that may have high upfront costs, but will help bring down CO₂ emissions," he added. "Solar energy is abundant, versatile and efficient. Through this solar facility the company will be able to contribute towards environment. Going forward, the company is committed to expand its environment care initiatives," Gandhi added. The solar power plant will help the company offset CO₂ emissions to the tune of over 1,200 tonnes annually, MSI said.

livemint.com

They kill good trees to put out bad newspapers. - JAMES G. WATT

GOOGLE ACQUIRES AIRBORNE WIND POWER COMPANY MAKANI

Makani Power, long one of the leaders in the growing field of airborne wind energy, now has a very large and rich parent. A statement on the company's website announced yesterday that Google would acquire Makani for an undisclosed amount; Google—or more specifically, Google.org, the company's philanthropic arm—had previously backed Makani to the tune of US \$15 million.



Makani makes a kite-like wind energy device, essentially a fixed wing with small turbines on board. The wing is tethered to the ground and flies in vertical circles to generate power, which is sent back down the tether to the ground, where it could be sent on to the grid. In its statement, Makani wrote that “the timing couldn't be better, as we completed the first ever autonomous all-modes flight with our Wing 7 prototype last week.”

Airborne wind power takes advantage of the fact that wind speeds are higher and more consistent as one gains altitude. Makani's current design would fly at around 500 meters; going even higher could garner even more energy. The recently-tested prototype is rated at 30 kilowatts capacity, but the company is on record as wanting to build a 600-kw wing that would have a wingspan of 92 feet. Google's money could potentially move that goal closer, quicker.

The purchase also may allay concerns about the loss, last fall, of Makani's founder and primary engineering pioneer, Corwin Hardham. Hardham, only 38 at the time, passed away unexpectedly at his desk. When I met him only a month or so earlier, he excitedly told me about plans to use even the 92-foot, 600-kw turbine as a mere starting point on the way to 5 megawatts.

The fact that Google was the one to purchase the company isn't all that surprising, given their ongoing efforts with renewable energy. The company has so far invested more than \$1 billion toward renewables, including backing BrightSource Energy's Ivanpah solar plant soon to open in the Mojave, the ambitious Atlantic Wind Connection transmission “backbone” project and others.

***FLY YOUR KITE FAR AWAY FROM POWER LINES OR SUBSTATIONS.
The kite and the string may conduct electricity -
sending it right through you to the ground.***

TRYST WITH DESTINY - JAWAHARLAL NEHRU

14 - 15 August, 1947

With the clock striking the midnight hour on 14-15th August, 1947, India was 'to awake to freedom'. The Constituent Assembly to whom power was to be transferred began its sitting at 11 pm with Smt Sucheta Kripalani singing Vande Mataram. It was a historic and memorable occasion in the life of the Constituent Assembly.

After an address by the President, Jawaharlal Nehru made his now famous Tryst with Destiny speech. He called upon the members to take a solemn pledge to serve India and her people.

Long years ago, we made a tryst with destiny, and now the time comes when we shall redeem our pledge, not wholly or in full measure, but very substantially. At the stroke of the midnight hour, when the world sleeps, India will awake to life and freedom. A moment comes, which comes but rarely in history, when we step out from the old to the new, when an age ends, and when the soul of a nation, long suppressed, finds utterance. It is fitting that at this solemn moment we take the pledge of dedication to the service of India and her people and to the still larger cause of humanity.

At the dawn of history India started on her unending quest, and trackless centuries are filled with her striving and the grandeur of her success, and her failures. Through good and ill fortune alike she has never lost sight of that quest or forgotten the ideals which gave her strength. We end today a period of ill fortune and India discovers herself again. The achievement we celebrate today is but a step, an opening of opportunity to the greater triumphs and achievements that await us. Are we brave enough and wise enough to grasp this opportunity and accept the challenge of the future?

Freedom and power bring responsibility. The responsibility rests upon this Assembly, a sovereign body representing the sovereign people of India. Before the birth of freedom, we have endured all the pains of labour and our hearts are heavy with memory of this sorrow. Some of those pains continue even now. Nevertheless, the past is over and it is the future that beckons to us now. That future is not one of ease or resting but of incessant striving so that we might fulfil the pledges we have so often taken and the One we shall take today. The service of India means the service of the millions who suffer. It means the ending of poverty and ignorance and disease and inequality of opportunity. The ambition of the greatest man of our generation has been to wipe every tear from every eye. That may be beyond us but as long as there are tears and suffering, so long our work will not be over.

And so we have to labour and to work and work hard to give reality to our dreams. Those dreams are for India, but they are also for the world, for all the nations and people are too closely knit together today for anyone of them to imagine that it can live apart.

Peace has been said to be indivisible; so is freedom, so is prosperity now, and so also is disaster in this one world that can no longer be split into isolated fragments. To the people of India, whose representatives we are, we appeal to join us' with faith and confidence in this great adventure. This is no time for petty and destructive criticism, no time for ill-will or blaming others. We have to build the noble mansion of free India where all her children may dwell.

I beg to move, sir, that it be resolved that:

After the last stroke of midnight, all members of the Constituent Assembly present on this occasion, to take the following pledge:

- (1) At this solemn moment, when the people of India, through suffering and sacrifice, have secured freedom, I a member of the Constituent Assembly of India, do dedicate myself in all humility to the service of India and her people to the end that this ancient land attain her rightful place in the world and make her full and willing contribution to the promotion of world peace and the welfare of mankind.
- (2) Members who are not present on this occasion do take the pledge (with such verbal changes as the president may prescribe) at the time they next attend a session of the Assembly.

Reference: Constituent Assembly Debates

HOW TO HARNESS RAINWATER

Why do you need to harness rainwater?

In a city like Chennai, where heavy spells of rainfall occur only during few months in a year, it is imperative to conserve rainwater-which otherwise inundates or drains into the sea – to recharge groundwater. Continuous groundwater recharge will improve the water table and its quality. It will also prevent sea water intrusion in coastal area and flooding in low-level localities.

How much rainwater can be saved?

Given the annual rainfall of 140 cm in Chennai, approximately 3,12,200 litres of rainwater can be collected in a plot of land measuring 223 sq. m. every year. At least 60 per cent of the rainwater can be recharged into the ground with effective RWH structures.

HOW TO MAINTAIN RWH STRUCTURES?

- * Clean the terrace
- * Ensure there are no blocks or cracks in the rainwater pipes

Soil types in Chennai

CLAYEY Kodungaiyur, Perambur, Purasawalkam to T.Nagar, Nungambakkam and Saidapet SANDY Royapuram, Chintadripet, Mandaveli and Thiruvannmiyur HARD ROCK Velachery, Taramani, Kotturpuram and Guindy

****What is the minimum width and depth of recharge well?**

A recharge well must be of a minimum diameter of 3 feet and depth of 10 feet to avoid overflow during heavy rains.

What are the different types of RWH structures?

- For area with sandy layer: A recharge well or percolation pit.
- For localities with clayey soil: A recharge well, preferably with a borehole of perforated pipes sunk until the sandy layer is reached, or a percolation pit
- For hard-rock areas: Build many recharge wells, as hard rock can be found within 10 feet. It is better to leave them empty instead of filling them with filter materials.

What are the methods of rainwater harvesting?

Rainwater collected could either be diverted to open wells or sumps for direct use or be used to replenish groundwater with recharge wells and percolation pits

- * Clean filter materials and refill them

- * Remove silt from the recharge wells

**

How to determine the type of soil in your area?

Approach a real estate dealer, civil engineer or ask a borewell operator to find out what kind of soil is predominant in the neighbourhood.

Who to contact for advice on RWH: Residents can contact the Chennai Metro water rainwater harvesting cell at 044-28454080

Expert SAYS - Sekhar Raghavan, Rain Centre's Director

- Observe RWH structure on rainy days. If it overflows, it is either inefficient or calls for maintenance.
- People focus more on harnessing rooftop water. But, driveway runoff around the building is as important.
- Percolation pit are not usually recommended as a long-term solution. But, in congested areas, they are a good option.
- It is important to install RWH structure according to the soil condition of the particular area to reap the maximum benefits.
- If rainwater is being diverted to open well or sump, filters are a must. They are not needed for groundwater recharge
- Cost of maintenance for most RWH structures will be Rs.1, 000-Rs. 1,500 per year.

Source: Chennai Metro Water and Rain Centre;
Courtesy: The Hindu, dt: 16.06.2014

TIRUPPUR KUMARAN



The state Tamil Nadu has many freedom fighters and they played major role in the Indian Independence movement. Many of them gave their breath and life to the country to get freedom. Tiruppur Kumaran is famous personality who struggled for the freedom of India and he gave his breath and life for the freedom. This article gives you the full details and contribution of Tiruppur Kumaran for the Indian freedom.

OKSR Kumaraswamy Mudaliar who was a famous freedom fighter in Tamil Nadu and he was born on 04-10-1904 in the small town named as Chennimalai in Tiruppur District of Tamil Nadu. He was popularly known as Tiruppur Kumaran. He involved himself in the Indian freedom movement in his young age and he participated in many struggles in the Indian freedom movement.

The role of Tiruppur Kumaran in Indian freedom movement

Tiruppur Kumaran had played a major vital role in the Indian freedom movement. He started “**DESA BANDHU YOUTH ASSOCIATION**” by grouping the youths and young persons from Tamilnadu to struggle against the British government to get freedom. Many persons got inspired and involved in the freedom struggle with Tiruppur Kumaran. He conducted many protest marches against the British government in many places of Tamil Nadu. He got more inspiration from the father

of our Nation Mahatma Gandhi. He followed the procedures and methods which were suggested by Gandhiji in the Indian freedom movement. Tiruppur Kumaran had also participated in Congress movement from the Tiruppur's contribution.

The honors which were given to Tiruppur Kumaran

The Tamil Nadu people are always remembering the contribution of Tiruppur Kumaran for the freedom of India by conducting various functions and programmes by the name of Tiruppur Kumaran. A memorial statue for Tiruppur Kumaran was erected in the park which is very near to Tiruppur Railway station. There is a street by his name which is called as “**Kumaran Salai**”. There is also a college in his name in Tiruppur and it is called as “**Tiruppur Kumaran College**”. The Government of India had released a commemorative stamp in his name on October 2004 during the 100th birth anniversary of Tiruppur Kumaran.



The ending days of Tiruppur Kumaran

The great and famous freedom fighter of Tamil Nadu, Tiruppur Kumaran died on 11th January, 1932. His death was very cruel that the Police assaulted him during the protest against the British colonial government. He was so patriotic that he died by holding the National flag of India which was banned by the British government. He is also called as “**Kodi Kaththa Kumaran**” due to this incident.



Courtesy: <http://www.tamilspider.com/resources/9284-Tiruppur-Kumaran-The-famous-freedom-fighter-Tamil-Nadu.aspx>

A coward is incapable of exhibiting love; it is the prerogative of the brave. – MAHATMA GANDHI

இரவு நன்றாக தூங்க உதவும் 5 உணவுகள்

செர்ரி பழங்கள்:

நம் உடலுக்குள் இருக்கும் உடலியக்கங்களை கட்டுப்படுத்தும் ஒருவகையான கடிக்காரமான உயிரியல் கடிக்காரமானது நம்ம தூக்கத்தையும் கட்டுப்படுத்துகிறது.

இந்த கடிக்காரத்தை உறக்கத்தை நெறிப்படுத்த ஆணையிடும் திறனுள்ள **மெலடோனின்** அப்படிக்கிற வேதியியல் பொருளின் இயற்கை உறைவிடம் தான் செர்ரிபழங்கள்.

அதனால் இரவு உறங்கச் செல்வதற்கு ஒரு மணி நேரத்துக்கு முன்பு இரண்டு செர்ரி பழங்களை சாப்பிட வேண்டும்.

வாழைப்பழம்:

இயற்கையான தசை தளர்த்திகளான பொட்டாசியம் மற்றும் மெக்னீசியம் நம்ம வாழைப்பழத்துல நிறைய இருக்கு.

அது மட்டுமல்லாமல் எல் ட்ரிப்டோபன் அப்படிக்கிற அமினோ அமிலமும் வாழைப்பழத்துல இருக்குது. இந்த எல் ட்ரிப்டோபன் அமினோ அமிலமானது மூளைக்குள்ளே 5 HTP – அப்படிக்கிற ஒரு ரசாயனமா மாறிவிடும். அதன்பிறகு இந்த 5 HTP- யானது செரடோனின் மற்றும் மெலடோனினாக மாறிவிடும்.

டோஸ்ட்:

நாம பொதுவா காலை உணவா அதிகம் சாப்பிடுற டோஸ்டுக்கும் தூக்கத்துக்கும் சம்பந்தம் இருக்குன்னு சொல்றாங்க விஞ்ஞானிகள். மாவுச்சத்து நிறைந்த உணவுகள் எல்லாமே இன்சலின் ஹார்மோன் சுரப்பதை தூண்டும். இந்த இன்சலின் ஹார்மோன் உறக்கத்தை தூண்டக்கூடியதாகும். இன்சலின் ஹார்மோனானது மூளையிலிருந்து ட்ரிப்டோபன் மற்றும் செரடோனின் ஆகிய ரசாயனங்களை ரத்தத்தில் அதிகரிக்கச் செய்யும் சமிக்ஞைகளை உருவாக்கிறதாம். மூளையிலிருந்து வெளியாகும் இவ்விரு ரசாயனங்களும் உறக்கத்தை தூண்டிவிடும் திறன் கொண்டவை ஆகும்.

ஓட் மீல்:

ஓட்ஸ் கஞ்சி சொல்லுவாங்களே அதத்தான் அமெரிக்காவில் ஓட் மீல் சொல்லுவாங்க.

அதாவது மேலே சொன்ன டோஸ்ட் மாதிரியே இந்த ஓட்ஸ் கஞ்சியும் ரத்தத்துல இருக்குற சர்க்கரை அளவை அதிகப்படுத்தி அந்த சர்க்கரை இன்சலின் ஹார்மோன் சுரப்பதை தூண்டிவிட அதன் விளைவாக உறக்கம் தூண்டும். மூளை ரசாயனங்கள் சுரந்து கடைசியா... உறக்கம் உன் கண்களை தழுவுட்டுமே... நிம்மதி நெஞ்சினில் மலரட்டுமே... அப்படின்னு நாம தூங்கிடலாம்.

கதகதப்பான பால்:

உறக்கம் தரும் இயற்கை உணவுகள் தரவரிசையில் நாம இன்னைக்கு பார்த்த மேலே இருக்குற 4 உணவுகளுமே புதுசுதான். ஆனா பால் மட்டும் பழசுதான். ஆமாம் சின்ன வயசுலேந்து ஒரு டம்ளர் பால் சாப்பிட்டு படுத்தா நல்லா தூக்கம் வரும் அப்படின்னு அம்மா காய்ச்சின பால் கொடுப்பாங்க இல்லையா?

ஆனா நம்ம அம்மாவுக்கு இந்த பால் இருக்குற எந்த வேதியியல் மூலப்பொருள் காரணமாக நமக்கு தூக்கம் வருதுன்னு தெரிஞ்சிருக்க வாய்ப்பில்லை.

வாழைப்பழத்துல இருக்குற எல்ட்ரிப்டோபன் அமினோ அமிலம் பாலிலும் இருக்கிறது. அதுதான் செரடோனின் உற்பத்தி மூலமா உறக்கம் வரவைக்கும். அதுமட்டுமல்லாமல் பாலில் அதிக கால்சியம் இருப்பது உறக்கத்தை தூண்டும் என்று விஞ்ஞானிகள் கூறுகிறார்கள்.

உறக்கம் நல்லா வரனுமனா இனிமே யாரும் தூக்க மாத்திரைகளை சாப்பிடாதீங்க. அதுக்கு பதிலா மேலே சொல்லியிருக்குற ஐந்து வகையான இயற்கை உணவுகளை சாப்பிட முயற்சி பண்ணுங்க. ஏன்னா, அவசியமில்லாம மாத்திரைகளை சாப்பிடுறது உடலுக்கு கேடுதான்.

மாவிலை:

மாமரம் சைவ சமயத்தில் ஒரு சில சிவலாயங்களில் தல விருட்சமாக விளங்குகிறது. மரப்பட்டை, வேர், பிசின் போன்றவை மருந்தாகப் பயன்படுகிறது.

இந்துக்கள் பண்டிகை, வீட்டு விசேஷங்கள், திருவிழாக்களின் போது மாவிலையை தோரணமாகக் கோர்த்து வாசலில் கட்டுவார்கள். இது மங்கள பொருளாக பயன்படுத்தப்படுகிறது. இது தவிர மா இலை சிறந்த கிருமி நாசினியாகும். வீட்டிற்கு வருபவர்களுக்கு ஏதேனும் சுவாசம் சம்பந்தப்பட்ட நோய்கள் இருந்தால் அது மற்றவர்களுக்கு பரவாமல் தடுக்கும் தன்மை மாவிலைக்கு உண்டு. இதனால் தான் நம் முன்னோர்கள் மாவிலைத் தோரணங்களைக் கட்டி வந்தனர்.

கிருமி நாசினியான மாவிலை:

கோமியத்தை வீட்டில் தெளிக்கும் போது மாவிலையை பயன்படுத்துவதை நம் கிராமங்களில் இன்றும் கடைப்பிடித்து வருகிறார்கள்.

கொழுந்து இலையை தேன் விட்டு வதக்கி குடிநீரில் போட்டு ஊறவைத்து அந்த நீரை அருந்தினால், குரல் கம்மல், தொண்டைக்கட்டு போன்றவை நீங்கும். நீரிழிவு உள்ளவர்கள், மா கொழுந்து இலையை எடுத்து உலர்த்தி பொடி செய்து தினமும் காலை மாலை 2 ஸ்பூன் அளவு அருந்தினால் நீரிழிவு கட்டுப்படும். தீக்காயம் பட்டவர்கள் மா இலையைச் சுட்டு சாம்பலாக்கி, வெண்ணெயில் குழைத்து பூசி வந்தால் தீப்புண் விரைவில் குணமாகும்.

மாம்பூவும், பட்டையும்:

மாம்பூவை நிழலில் உலர்த்தி எடுத்து பொடித்து நீர்விட்டு கொதிக்க வைத்து குடிநீராக அருந்தினால், வயிற்றுப்போக்கு, வயிற்றுக் கடுப்பு போன்றவை நீங்கும், இளம் மாடுக்களை எடுத்து கம்பு நீக்கி காயவைத்து, உப்பு நீரில் போட்டு ஊறவைத்து வெயிலில் காயவைத்து வைத்துக் கொண்டு உணவுடன் சேர்த்து சாப்பிட்டால், சீரண சக்தி அதிகரிக்கும். வாந்தி குமட்டல் நீங்கும்.

மாம்பட்டையைக் குடிநீர் செய்து அருந்தினால் சருமம் சம்பந்தப்பட்ட நோய்கள் ஏதும் அணுகாது. மா வேர்ப்பட்டை வயிற்றுப்புண், குருதிக்கழிச்சல் போன்றவற்றை நீக்கும்.

பித்த வெடிப்பு குணமாகும்:

பித்த வெடிப்பினால் கால் வலி ஏற்படுவதோடு பாதங்கள் பார்ப்பதற்கே அருவெறுப்பாக காணப்படும். கால் பித்தவெடிப்பு உள்ள பகுதியில் மாம்பிசிணைத் தடவி வந்தால் பித்த வெடிப்பு குணமாகும். தேமல், படை உள்ளவர்கள் மாம்பிசிணை மாம்பழச் சாறுடன் கலந்து பூசினால் தேமல், படை நீங்கும்.

மாங்காய்

மாங்காயை சமைத்துச் சாப்பிடுவது நல்லது. அல்லது ஊறுகாய் செய்து சாப்பிடலாம். மாங்காய் அதிகம் சாப்பிட்டால், பசிசின்மை, புண் ஆறாமை, பல் கூச்சம், சிரங்கு போன்றவை உண்டாகும்.

ஜீரண சக்தி அதிகரிக்கும்

மாம்பழம் அதிக வைட்டமின் சத்துக்கள் நிறைந்தது. இதனை கிடைக்கும் காலங்களில் அளவோடு சாப்பிட்டு வந்தால் சிறந்த பயனை அடையலாம். கோடைக்காலத்தில் அதிகம் விளையும் மாங்கனி மிகுந்த சுவை கொண்டது. மலச்சிக்கலைப் போக்கும், சீரண சக்தியை அதிகரிக்கும். வயிற்றுப்புண், வாய்ப்புண்ணை ஆற்றும். மூல நோயின் பாதிப்பைக் குறைக்கும்.

உதிர்ப்போக்கு கட்டுப்படுத்தும்

மாங்கொட்டை பருப்பை எடுத்து காயவைத்து பொடித்து கஷாயம் செய்து மாதவிலக்குக் காலத்தில் அருந்தினால், அதிக உதிர்ப்போக்கு கட்டுப்படும். வெள்ளைப்படுதல் குணமாகும். வயிற்றுப் புழுக்கள் நீங்கி, வயிற்றுப்புண் ஆறும். வயிற்றுக்கடுப்பு, வயிற்றுப்போக்கு குணமாகும். மாம்பருப்பை எடுத்து பொன்றிமாக வறுத்து தூள் செய்து 1 ஸ்பூன் அளவு எடுத்து தேனில் கலந்து சாப்பிட்டு வந்தால் சரும எரிச்சல் நீங்கும்.

மாம்பட்டையைக் குடிநீர் செய்து அருந்தினால் சருமம் சம்பந்தப்பட்ட நோய்கள் ஏதுவும் அணுகாது. மா, வேர்ப்பட்டை வயிற்றுப்புண், குருதிக்கழிச்சல் போன்றவற்றை நீக்கும்.

Courtesy: PESOT Newsletter, December 2013

HOME FESTIVALS

Purattasi (September/October)



Navaratri (“nine nights”) is the principal festival this month (above left). The Goddess is worshipped in Her many forms, and on the ninth day, Sarasvati (center of the painting) is invoked to bless musical instruments, account books, agricultural instruments and home tools(upper left). On Vijaya Dasami, the day following Navratri, Goddess Durga is invoked as children are given their first instruction, worship their school books and honour their teacher (bottom left). A decorated display of dolls (lower right) is displayed through the nine days, then dismantled and stored on the tenth day. Vijaya Dasami is also the birthday of Lord Venkateshwara (upper right), presiding Deity of Tirupati temple in Andhra Pradesh, India’s wealthiest temple.

(To be continued)

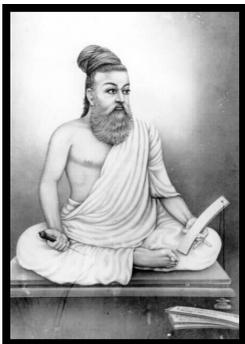
DASOPADESAM

Ten codes for living

1. One of our duties as human beings is to avail ourselves of every opportunity to do good to others. The poor can serve others by their loyal work to the country and the rich by their wealth to help the poor.
2. Those who are influential can use their influence to better the condition of the lowly. That way we can keep alive in our hearts a sense of social service.
3. Man by himself cannot create even a blade of grass. We will be guilty of gross ingratitude if we do not offer first to God what we eat or wear only the best and choicest should be offered to Him.
4. Life without love is a waste. Everyone should cultivate “prema” or love towards all human beings, birds and beasts.
5. Wealth amassed by a person whose heart is closed to charity, is generally dissipated by the inheritors: but the family of philanthropists will always be blessed with happiness.
6. A person who has done a meritorious deed will lose the resulting merit if he listens to the praise of others or himself boasts of his deeds.
7. It does no good to grieve over what has happened. If we learn to discriminate between good and evil, that will guard us from falling into evil again.
8. We should utilize the days of our life-time to good purpose. We should engage ourselves in acts which will contribute to the welfare of others rather than to our selfish desires.
9. We should perform duties that have been prescribed for our daily life and also be filled with devotion to God.
10. One attains one’s goal by performance of one’s duties. Jnana is the only solvent for our troubles and sufferings.

- H.H. Shri Paramacharya

TIRUKKURAL AND MANAGEMENT IN A ‘NUTSHELL’ - 16



Tiruvalluvar, uniquely introduces a word “**VAIMAI**”, which is in between the absolute Truth and a blatant lie. He himself explains what he really means by “Vaimai” and when I how it should be used by Managers to deal with situations and bring about welfare for all.

Tiruvalluvar has devoted a set of Ten Kurals to illustrate the need and the power of being transparent and truthful and also the need for diplomacy with “Vaimai”.

*Vaimai Enappaduvathu Yathuenin Yathunedrum
Theemai Ilatha Solal* *Kural 291*

வாய்மை எனப்படுவது யாதுஎனின் யாதுஒன்றும்
தீமை இலாத சொல்லல் குறள் 291

“What is Truthfulness? It is the speaking of that which is free from even the slightest taint of evil”.

*“Poimaiyum Vaimai Idatha Puraitheerntha
Nanmai Payakkum Enin* *Kural 292*

பொய்மையும் வாய்மை இடத்த புரைதீர்ந்த
நன்மை பயக்கும் எனின் குறள் 292

“Even falsehood is of the nature of Truth, if it bringeth forth unmixed Good”.

*Manaththodu Vaimai Mozhiyin Thavaththodu
Dhanamsey varin Thalai* *Kural 295*

மனத்தொடு வாய்மை மொழியின் தவத்தொடு
தானம்செய் வாரின் தலை குறள் 295

“Behold the man whose heart is fixed in Truthfulness: he is greater than the austere and greater than he that maketh gifts to the poor”.

*Puramthoymai Neeran Amaiyum; Ahamthoymai
Vaimaiyal Kaanap padum* *Kural 298*

புறம்தூய்மை நீரான் அமையும்; அகம்தூய்மை
வாய்மையால் காணப் படும் குறள் 298

“Water cleaneth but the outward form; but the purity of the heart is proved by truthfulness.”

MIAMI TOWER

The iconic Miami Tower is a 47-storey office building located in the heart of downtown Miami. This prestigious address is the home to many of Miami's established and most influential firms. The building with its modern design is famous in the Miami skyline for its color-changing lighting scheme and has frequently been featured in films and television shows. Miami Tower used 352 large 1,000 watt (1,100 watts with ballast) metal halide fixtures located on the north, northwest and west façades of the building and in various setbacks on the 13th, 20th and 31st floors. The Tower also used 400 watt (465 watts with ballast) metal halide fixtures on the 46th floor. Creating the color effects on the building was costly and required a maintenance crew to use cumbersome and expensive gels. In order to fully light the exterior, building management also leased space on neighbouring roof decks where they housed additional lighting fixtures at a cost of \$110,000 annually. Jones Lang LaSalle (JLL), the building's management company, knew it was time to investigate a new lighting system that was not only more energy-efficient, but would also allow the building to keep its visibility in the night skyline. Facility executives tasked Jones Lang LaSalle's Energy and Sustainability Solutions (ESS) experts to seek a better alternative. The group called on LED Source® to help find a replacement for their 16-year old system.

LED Source® recommended a Philips Color Kinetics LED lighting solution. The new LED lighting system would be more energy efficient and allow for the creation of custom light shows at the push of a button, without costly gels or maintenance processes. It would also allow the building management to house all of the lighting on-site, saving the yearly lease fee. At first, the JLL team was tentative about the new technology. To prove that the LED lighting system would provide more vivid lighting than the ageing metal halide system, LED Source® produced a full 3D rendering of the building. They then invited JLL's management and ESS team to see the capabilities of the proposed system in person during a test on the west section of the building. To further the case, LED Source® also worked with JLL's ESS team to provide a cost comparison of the new LED system with the current system, which showed that the total replacement proposal would have an annual reduction of 807,688 kWh – including a savings of 91.9% annually in exterior lighting energy costs. In addition, JLL would subsequently save \$259,767 annually in energy, maintenance and operating costs. The LED lighting system was unanimously approved and the 382 metal halide fixtures were replaced with 168 ColorReach Powercore fixtures and 48 ColorGraze Powercore fixtures.

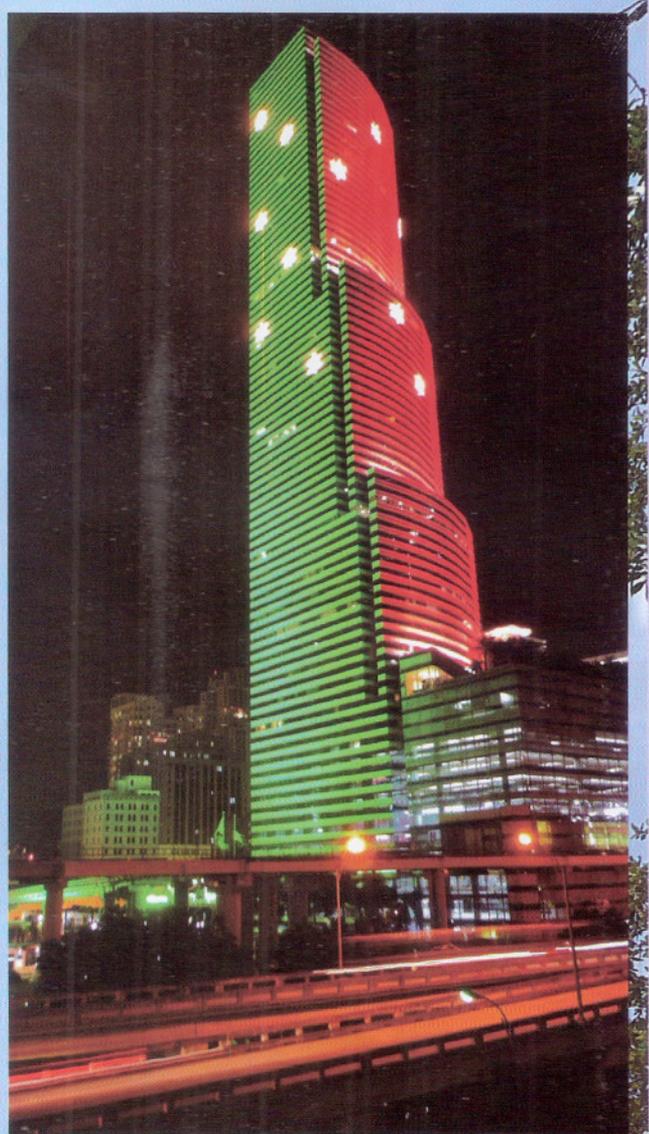
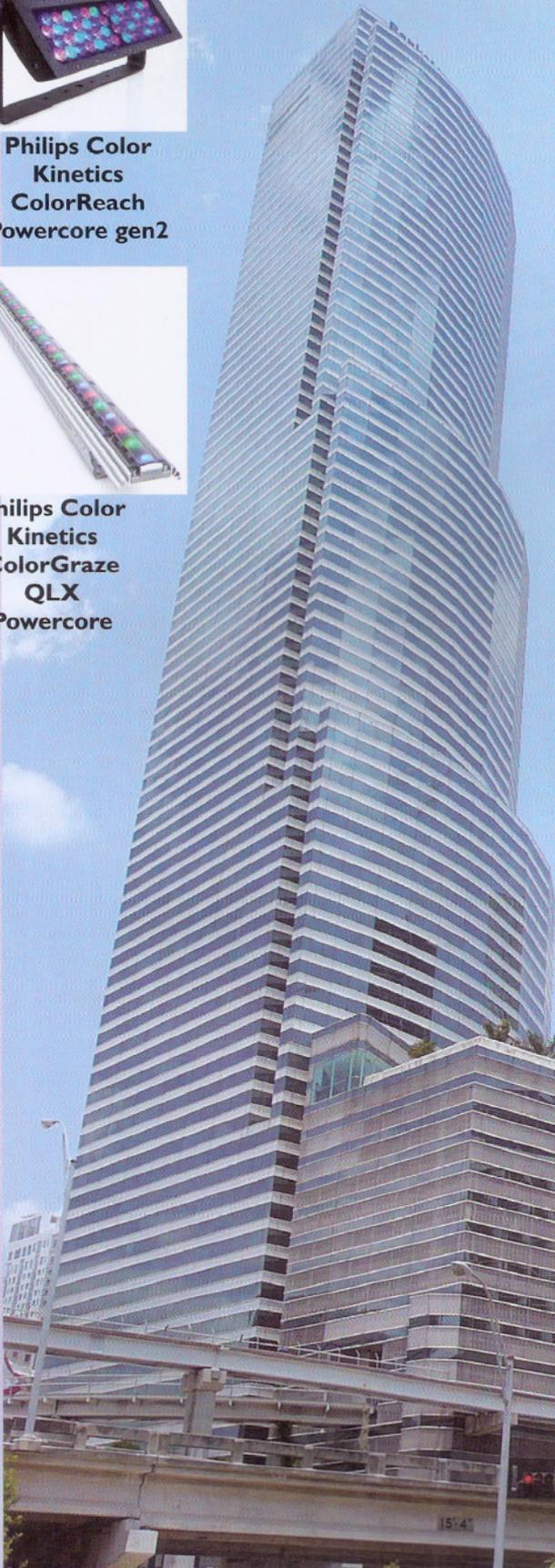
MIAMI TOWER



Philips Color
Kinetics
ColorReach
Powercore gen2



Philips Color
Kinetics
ColorGraze
QLX
Powercore

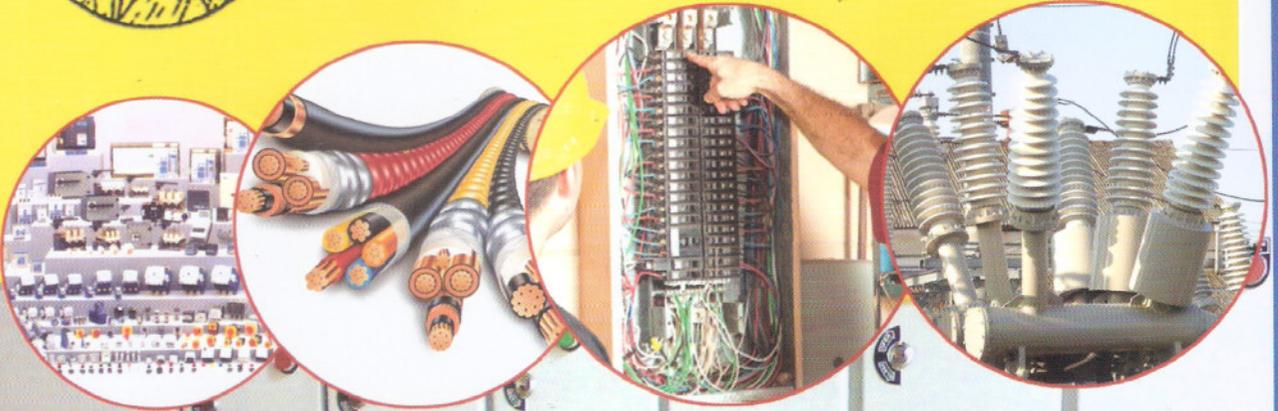




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