ELECTRICAL INSTALLATION ENGINEER

NEWS LETTER

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

L&T Training Programme

Industrial Protection with Numerical Relays	1st – 4th November 2016
Reactive Power & Harmonics Mitigation	3rd – 4th November 2016
Best Maintenance Practices in LV Switchgear	7th – 11th November 2016
Switchboard Electrical Design	14th – 16th November 2016
Electrical Safety	25th November 2016
Conservation & Management of Electrical Energy	28th – 29th November 2016
Introduction to Industrial Electrical Systems	28th – 30th November 2016
Requirement of System & Equipment Earthing	30th November 2016

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

POWERELEC INDIA
International Power, Electrical & Electronics Expo
9 - 11 March 2017 | B C E C , Mumbai - India

Events Profile: International Power, Electrical, & Electronics Expo. Powerelec India will feature Power Generation, Renewable Energy, Energy Transmission & Distribution, Power Electricals, Power Electronics & Automation as well as Lighting and Fixtures
Date: 24th – 26th October 2016
Venue: BCEC, Mumbai, India
Website:http://www.powerelec.co.in/

VOLTAGE™ TRADE SHOW

Events Profile: The focus is on renewable energies. Apart from the established companies especially the small and medium-sized enterprises and entrepreneurs will have the opportunity to showcase of their products and services.
Date: 21st – 23rd November 2016
Venue: Mahatma Mandir, Gandhi Nagar, Gujarat, India
Website: http://www.voltagetradeshow.com/

EL Asia
INTERNATIONAL EXHIBITION ON POWER, ELECTRICAL AND LIGHTING.

Events Profile: The show will constitute an ideal platform not just for maximum exposure of cutting-edge products & services to key Electrical, Electronics, Lightings & Power sector players and top decision-makers but also for the kind of high-powered face-to-face business meetings and contacts that will take an Organisation forward in leaps and strides.
Date: 12th – 14th April 2017
Venue: Bombay Exhibition Centre, Mumbai, India
Website: http://www.elasia-expo.com/

EDITORIAL

Dear Members, Fellow Professionals and Friends

Seasons Greetings To One And All!

Greetings For A Happy Ayudha Pooja!!

Best Wishes For A Bright And Happy Deepavali!!!

October is a month of important festivals of worship, work and joy. This is also a month that begins reminding us of the **'Father of the Nation'** who worked his way through **'Ahimsa'** for the Freedom of the Nation and lived a *life of Truth*, *Morality* and *Courage* to set an example for all of us to follow. We all recognize the fall in moral standards, particularly in public life and let us all resolve to work towards correcting the same with all our involvement.

India has the proud tradition of **"Work is Worship"** and we celebrate **'Ayudha Pooja'** as a mark of respect for the Profession, Machinery and the Tools. A recent comment by one of the European Engineering giants about the problems of investing in India, that the main problem is lack of availability of sufficient skilled work force in India as only a very small percentage of youth, after 10th standard go for skill training in India. Though this may sound a little disturbing, steps are being initiated by the Government through its New Education Policy for providing impetus for skill training after schooling.

Deepavali, the Festival of Lights, is also celebrated during this month, which reminds us of the Great Invention of Electric Lights about 150 years ago, which brought illumination to the whole world. Looking at the way we spend most part of the 'Nights' these days in Entertainment and Games, we can't even imagine a world without Lights now.

Another most important Day to remember and initiate action this month is the **"World Standards Day"** celebrated every year on the **14th of October. International Electro Technical Commission (IEC)** is one of the important Institution and partner making up the World Standards Cooperation (WSC). As we are all aware, IEC plays an important role in evolving Standards for Electrical Equipments, Systems, Installations and Safety. The theme of the year for the World Standards Day is **"Standards Build Trust"** and a theme for one of the earlier years was **"Less waste, better results – Standards increase efficiency"**. We are publishing a write up on the theme and the celebration separately in this issue for the information of the readers. Standards and Labeling is one of the important initiatives by the Bureau of Energy Efficiency in India after its formation in 2001/2 for Energy Conservation through Energy Efficiency, is to introduce Standards for Energy Efficient Equipments and introduce labeling with "Stars" to indicate the levels of Efficiencies. We commonly see today various appliances, fittings and equipments with 'Star' markings clearly indicating the Efficiency levels and the common buyer/ user is clear that higher number of stars indicate better levels of efficiencies and so on.

We thank all those members who have helped us by participating in the advertisement appearing for the issue September 2016 – Ashlok Safe Earthing Electrode Ltd., Dehn India Pvt. Ltd., The Motwane Mfg. Co. Pvt. Ltd., Elecxpo-5th Edition, Power Links, E Power Engineering, OBO Bettermann India Pvt. Ltd., Anchor Electricals Pvt. Ltd., Electrotherm (India) Ltd., Galaxy Earthing Electrodes (P) Ltd., Safvolt Switchgears Pvt Ltd., Supreme Power Equipment Pvt. Ltd., Sun sine Solution Pvt. Ltd., Wilson Power and Distribution Technologies Pvt. Ltd., Abirami Electricals, Universal Earthing Systems Pvt. Ltd.

EDITOR

If everyone is moving forward together, then success takes care of itself. - HENRY FORD

ELECTRICAL INSTALLATION ENGINEER

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137.	K.K. Singh Electricals	Chennai	044-22266663, 98842 96617	EA 1797
138.	Karpaga Vinayagar Electricals	Chennai	044-22741032, 99401 31064	EA 1950
139.	Kumaran Industries	Chennai	044-22388265, 98400 37776	ESA 305
140.	Madras Electrical & Data Solutions	Chennai	044-43012110, 98409 28199	EA 2433
141.	Murugan Electrical Traders	Chennai	044-26423428, 98401 65659	ESA 240
142.	Power Trac Engineers Pvt. Ltd.	Chennai	044-24992825, 90030 65358	ESA 228
143.	Richards & John Wesley Engineers Pvt. Ltd.	Chennai	044-26542285, 94449 04520	EA 2829
144.	Shakthi Electricals	Chennai	044-22434629, 98410 43567	ESA 397
145.	Sharavathy Electricals	Chennai	044-26267520, 94442 09144	EA 2345
146.	Shri Sakthi Electricals	Chennai	044-28474069, 93835 70257	EA 1896
147.	Sri Balaji Enterprises	Chennai	044-24845868, 98847 09974	EA 2515
148.	Sri Ram Electricals	Chennai	044-24725463, 98840 41259	ESA 242
149.	Sruthi Engineering	Chennai	080-26602828, 098869 08445	EA 2098
150.	SS Engineering	Chennai	044-22520298, 92836 92677	EA 2426

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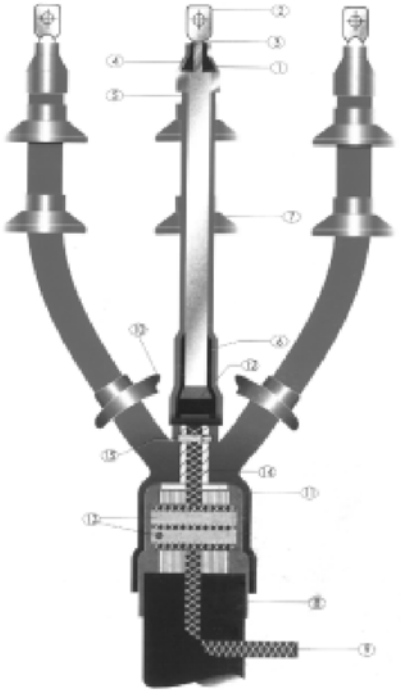

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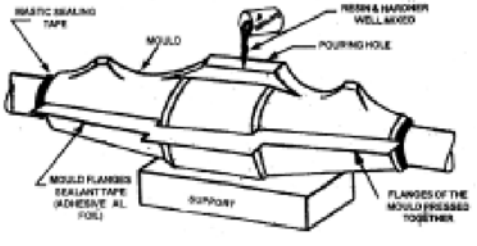


WORLD STANDARDS DAY – 14-10-2016

Each year on 14 October, the members of the IEC, ISO and ITU celebrate World Standards Day, which is a means of paying tribute to the collaborative efforts of the thousands of experts worldwide who develop the voluntary technical agreements that are published as international standards.

The World Standards Day message is signed by the leaders of the three principal international standardization organizations: President of the International Electrotechnical Commission (IEC), President of the International Organization for Standardization (ISO), and Secretary-General of the International Telecommunication Union (ITU). The three organizations are the partners making up the World Standards Cooperation (WSC).

Standards connect us with reliable modes of communication, codes of practice and trusted frameworks for cooperation. Introducing common interpretations on reciprocal sides of a communication or transaction, standards are essential to mutually beneficial trade and resource efficient international commerce.

Social interaction relies on common respect for fundamental sets of norms, concepts or meanings – international standards codify these norms to ensure that they are accessible to all.

A product or service conforming to an international standard is imbued with a trusted symbol of quality, safety or compatibility. Standards speak to the diversity of our interconnected world, introducing uniformity at the interfaces where we need to be certain that we are speaking on the same terms.

Dr. Junji Nomura
IEC President

Zhang Xiaogang
ISO President

Houlin Zhao
ITU Secretary-General

"Raise your quality standards as high as you can live with, avoid wasting your time on routine problems, and always try to work as closely as possible at the boundary of your abilities. Do this, because it is the only way of discovering how that boundary should be moved forward." - EDSGER W. DIJKSTRA

KNOW THY POWER NETWORK - 109

This time let us start with an interesting piece of news related to Batteries. Did you go through the newspaper article describing the **"Battery Woes"** suffered by M/s Samsung and other electronic device manufacturers. If not, kindly move further. Because of defective batteries, M/s Samsung had to recall (get back) nearly 50000 Nos of "Galaxy Note 7 phones" from their buyers. All manufacturers, who generally utilize lithium batteries in their devices / equipment, face the same music. There is no exception – everything from "i phones" to "Telsa Cars" to "Boeing Jet Liners" are impacted by this malfunctioning of the very small cells or batteries. Reason – All these tiny lithium cells are forced to **"overwork or unduly loaded beyond their capability".**

They are forced to work continuously in an unfriendly, stressful operating environment or always in a stressful condition under more duress result – They show their displeasure or exhibit their distress by bursting into flames at an unwanted time. This process does not occur instantly. The affected cells gradually express their displeasure – first by initiating an uncontrollable chain, chemical reaction which gradually escalates and finally ends in a big fire ball, that engulfs / envelopes every item in the vicinity. Main factor responsible for this undesirable phenomenon is our unjustified demand placed on these tiny battery cells for achieving a miniature system which occupies less space at a lesser cost. In the process, we forget about the nature and capability of these small lithium cells and also the fact that batteries are always prone to leaking and even bursting into flame. So when a cell get damaged or becomes defective, the damaged component is not only exposed to over heating or excessive heating but also to leaking / oozing of electrolyte. This condition is a good receipe for sparks with the consequential fire since the combustible components of the battery cells are separated by ultra thin walls which may burst very quickly with a little pressure or force. The basics factor for this unwanted condition is nothing but the heavy thrust made by us on these tiny battery cells to store a large quantum of energy in a very small space to achieve greater storage of electrical energy.

Many recent events attest this basic theory connected with the malfunctioning of lithium cells. Notable among the cases in point are,

- Explosion of a new Samsung Galaxy Note 7 phone is an Australia hotel leading to injuries to the user and damages to the bed as well – **Cause:** defective battery cell.
- Appearance of smoke in the Cargo bay of Fuji Airways Boeing 737, when it was about to take off at Malbourne Airport in Australia

Source of smoke: A leaky "i phone" battery in the carry bag of a passenger which was checked and cleared earlier.

- Frequent fires in the Hover Boards (self balancing scooters) in USA – **Reason:** Defective battery cells are the main source of these fires.
- Frequent fire accidents met by Tesla model – S Sedan cars – **Reason:** Highly stressed battery cells which start behaving abnormally when exposed to road debris or dust.
- Exposure of HP products to overheating, charring and melting C**ause:** Defective battery cells.

From these one can easily note the added significance of batteries in our day-to-day life and also the focused need for learning the characteristic features, behaviour and testing of large and small batteries.

It is time for us to turn our attention to our regular topic. There are many parameters related to the operation, condition, monitoring and testing of storage batteries significant among them are,

- **Impedance:**

It indicates the condition of the DC battery system without placing any stress on them. It simply reflects the condition of the entire electrical path of a battery from terminal to terminal and thereby shows the defects in the cells and intercell connectors as well. The storage battery behaves more or less like a capacitor since it stores electrical energy. The impedance test measures both the capacitance and resistance of a battery.

A battery is a complex device having more than one electrochemical process at any time e.g it faces ion diffusion and charge transfer. The storage capacity of the cell becomes reduced during a discharge due to the conversion and depletion of the active material. In addition, the sulphates formed during the charge transfer process increases the resistance to charge transfer since sulphates offer high resistance to the flow of electricity. Thus the measurement of internal resistance and capacitance of a battery is always important.

➢ **Inter cell connection resistance:**

It is well known that a battery is formed by connecting a number of cells in a series path. So intercell connection assumes a greater significance since any one component fails the entire series connection of the cells and hence the battery is affected failure of many batteries is attributed to this **"weak intercell connections"** and not due to weak cells. A low electrical resistance is always preferred in the intercell connections. This aspect warrants a focused attention on the reliable intercell connections during the commissioning of the battery. In way this step will help to ensure the required discharge rates of the batteries. During intercell resistance test, the variation of the resistance will be less than **"Ten Percent".** Normally it will be in the order of a few micro ohms. (less than 100 micro ohms)

➢ **Voltage:**

In the case of a healthy cell it simply indicates the "State of – Charge of the cells". It never indicates a "State – of health" of the cells. A normal cell voltage simply tells that the cell is fully charged. In the case of defective cells, an abnormality in the cell voltage can be observed. A low cell voltage will indicate a short cell; this condition happens when the cell voltage falls to 2.03V or below. This low voltage condition flags that the cell in question is subjected to degradation and so it may not be able to support the load if any suddenly incident on the battery. In such condition, impedance measurement can reveal more; it is able to identify the weak cell more quickly than the voltage measurement method. It is mainly because of the fact that the short circuit happening in the suspect cell brings the fall in the impedance value more significantly in a discernible way. So there lies a need to clearly understand that **"fully charged"** battery cannot be taken as the one having **"full capacity".** Both are different terms referring to different conditions of the battery cells.

➢ **Specific Gravity:**

Another important parameter that requires attention when we discuss the healthiness of a battery. It is the measure of the sulphate present in the lead acid battery containing sulphuring acid as its electrolyte. It can also be treated as a measure of potassium hydroxide electrolyte in a Nickel Cadmium Battery. This topic will be dealt with in detail in the ensuing issues.

Let me sign off here.

(To be continued...)

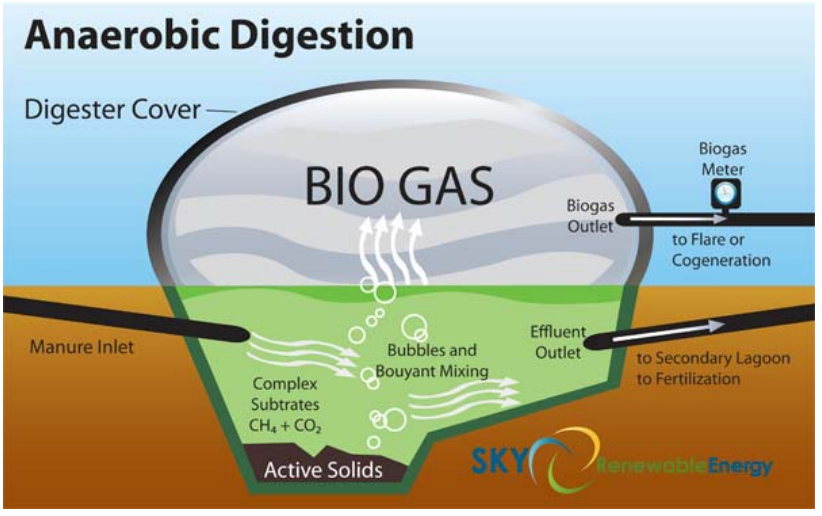
V. Sankaranarayanan, B.E., FIE,
Former Addl. Chief Engineer/TNEB
E-mail: vsn_4617@rediffmail.com
Mobile:98402 07703

25 ULTIMATE TIPS FOR BETTER LIFE!!!

1. Take a 10-30 minute walk every day. & while you walk, SMILE.
It is the ultimate antidepressant.
2. Sit in silence for at least 10 minutes each day.
3. When you wake up in the morning, Pray to ask God's guidance for your purpose, today.
4. Eat more foods that grow on trees and plants and eat less food that is manufactured in (plants)-Factories.
5. Drink green tea and plenty of water. Eat blueberries, broccoli, and almonds.
6. Try to make at least three people smile each day.
7. Don't waste your precious energy on gossip, energy vampires, issues of the past, negative thoughts or things you cannot control. Instead invest your energy in the positive present moment.
8. Eat breakfast like a king, lunch like a prince and dinner like a college kid with a maxed out charge card.
9. Life isn't fair, but it's still good.
10. Life is too short to waste time hating anyone. Forgive them for everything !
11. Don't take yourself so seriously. No one else does.
12. You don't have to win every argument. Agree to disagree.
13. Make peace with your past so it won't spoil the present.
14. Don't compare your life to others. You have no idea what their journey is all about.
15. No one is in charge of your happiness except you.
16. Frame every so-called disaster with these words: 'In five years, will this matter?'
17. Help the needy, Be generous ! Be a 'Giver' not a 'Taker'
18. What other people think of you is none of your business.
19. Time heals everything.
20. However good or bad a situation is, it will change.
21. Your job won't take care of you when you are sick. Your friends will. Stay in touch.
22. Envy is a waste of time. You already have all you need.
23. Each night before you go to bed , Pray to God and Be thankful for what you'll accomplish, today !
24. Remember that you are too blessed to be stressed.
25. **Share this with everyone.**

NATIONAL BIOGAS AND MANURE MANAGEMENT PROGRAMME (NBMMP)

National Biogas and Manure Management Programme is a Central Sector Scheme, which provides for setting up of Family Type Biogas Plants mainly for rural and semi-urban/ households. A family type biogas plant generates biogas from organic substances such as cattle –dung, and other bio-degradable materials such as biomass from farms, gardens, kitchens and night soil wastes etc. The process of biogas generation is called anaerobic digestion (AD) and salient benefits of biogas technology are given below-



1) It provides clean gaseous fuel for cooking and lighting.
2) Digested slurry from biogas plants is used as enriched bio-manure to supplement the use of chemical fertilizers.
3) It improves sanitation in villages and semi -urban areas by linking sanitary toilets with biogas plants.
4) Biogas Plants help in reducing the causes of climate change.

2. Ministry of New and Renewable Energy is implementing the National Biogas and Manure Management Programme (NBMMP) in all the States and UTs of the country. About 47.5 Lakh biogas plants have already been installed in the country upto 31st March, 2014. During the year 2014-15, a target of setting up 1,10,000 biogas plants has been set. The Biogas plant is the best option for households having feed material, to become self- dependent for cooking gas and highly organic enriched bio-manure. It provides the solution to protect the households from the problems of indoor air pollution and while saving on cost of refilling of LPG cylinders. The Ministry provides subsidy for family type biogas plants as per the rates given below:

Subsidy for setting up of Biogas Plants under National Biogas and Manure Management Programme

S. No.	Particulars of Central Financial Assistance (CFA) & States / Regions and Categories	Family Type Biogas Plants under NBMMP (1 to 6 cubic metre capacity per day)	
A.	**Central Subsidy Rates Applicable (In Rs.)**	**1 Cubic Metre**	**2- 6 Cubic Metre**
1.	NER States, Sikkim (except plain areas of Assam) and including SC & ST Categories of NE Region States.	15,000	17,000
2.	Plain areas of Assam.	10,000	11,000
3.	Jammu & Kashmir, Himachal Pradesh, Uttrakhand, Niligiri of Tamil Nadu, Sadar Kurseong & Kalimpong Sub-Divisions of Darjeeling, Sunderbans (W.B.) and Andaman & Nicobar Islands.	7,000	11,000
4.	Scheduled castes / Scheduled Tribes of all other States except NE Region States (including Sikkim).	7,000	11,000
5.	**All Others**	5,500	9,000

S. No.	Particulars of Central Financial Assistance (CFA) & States / Regions and Categories	Family Type Biogas Plants under NBMMP (1 to 6 cubic metre capacity per day)
B.	**Turn-Key Job Fee including warranty for five years and quality control (in Rs. per plant).**	Rs.1500/- per plant for fixed dome Deenbandhu type and floating gasholder KVIC type brick masonry models. Turn Key Job Fee also provided for biogas plants with prefabricated material involving part construction work either for digester or dome. No fee is provided for completely prefabricated / manufactured plants such as Bag type plants with rubberized material or plants made of HDPE / PVC / fabric materials, as and when approved.
C.	**Additional subsidy (CFA) for toilet linked Biogas Plants (in Rs. per plant).**	1,200/-

The programme is being implemented by the State Nodal Departments/State Nodal Agencies and Khadi and Village Industries Commission (KVIC), Biogas Development and Training Centers (BDTCs). The interested potential beneficiaries may contact to the concerned programme implementing Agencies of the States.

RITU KUMAR — *Designer* — ENTREPRENEUR

RITU KUMAR
Designer

RITU KUMAR

If you have basic intelligence and are ready to take up a task diligently you can do anything! It might not be as enjoyable as your favourite pursuits but its equally enriching and feasible," – Ritu Kumar

A first-generation entrepreneur and anthropologist who is commonly called the 'pride of India'. The desire to own a Ritu Kumar original is undoubtedly every woman's dream. Today she is one of India's foremost fashion designer who created distinct style of designing, and the first woman to introduce the 'boutique' culture in India under the brand name **'Ritu'**. She had a humble beginning in a small village, near Kolkata, in 1960, with hand block printers to flaunt about. Her commitment towards crafts spans 45 years. Ritu has pioneered the term **'fashion'** in the Indian context, and has demonstrated that hand made products can be a profitable and even more glamorous than those made by machine. Ritu Kumar's forte lies in traditional Indian clothes that draw heavily on the textile and embroidery heritage of India. Since the company was built on patronage of craftsmen, it had created employment opportunities in underdeveloped areas.

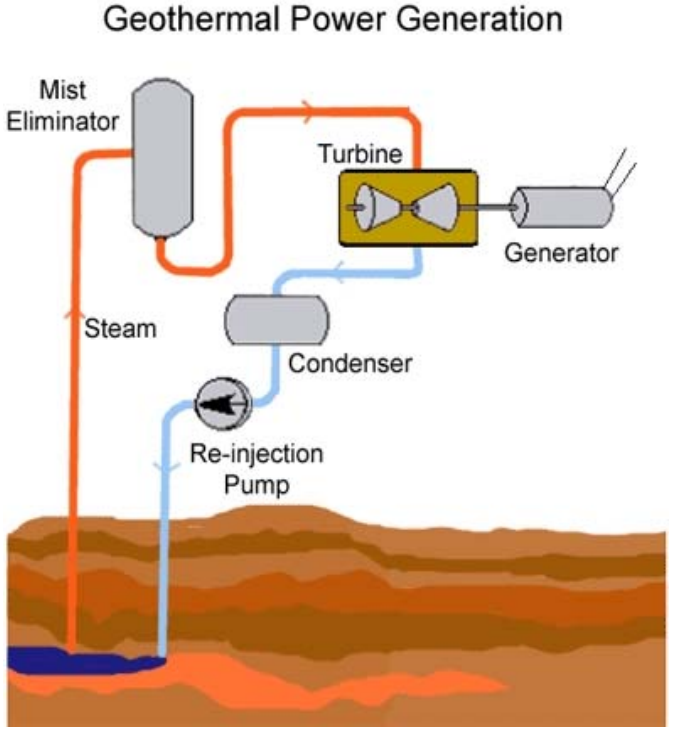
Ritu Kumar has been awarded the Padma Shri Award 2013, the country's fourth highest civilian award for her exceptional and distinguished service in the field of fashion, textile and craftsmanship. She was honoured with Lifetime Achievement Award by National Institute of Fashion Technology in 1998 and by the Kingfisher group of industries. She also received the Outstanding Women Entrepreneur Award 1998, bestowed by the PHD - Chamber of Commerce. She has written a book, titled Costumes and Textiles of Royal India, which was published in 1999. The book chronicles in detail, the patronage of India's royalty to textile crafts. She says, "I believe in going deep into the roots of every design to find out its relevance in the present context. I also try and visualize whether a woman would look elegant in my designs. It's a lot of hard work. But then this is a very competitive field and unless you put in that extra effort you will lag far behind".

FRANCE OPENS DEEP GEOTHERMAL POWER PLANT

The French Minister of the Environment, Energy and Marine Affairs, responsible for International Climate Relations, has inaugurated the Rittershoffen deep geothermal power plant.

The plant was built by Électricité de Strasbourg, Roquette and the Caisse des Dépôts with the financial backing of the ADEME, represented by its Chairman, Bruno Léchevin, and the Region, represented by Philippe Richert, President of the Regional Council of Alsace Champagne Ardenne Lorraine.

The Rittershoffen deep geothermal power plant is the first of its kind in the world, a model of energy transition and environmental strategy, which opens up important new possibilities for regional and national development. It is the first power plant to use steam from geothermal water to provide energy to an industrial site, in this case the Roquette Group in Beinheim. Water is brought up from a depth of 2500 m at a temperature of 165°C. The heat is then removed from the water, which is injected back to the same source. The energy is therefore 100% renewable, constant and fully energy-efficient.



This innovative, ambitious project is driven by 3 partners committed to the development of renewable energies:

- **ÉS** is a leading local energy utility which, over the past 30 years, has been investing in the research and development of local renewable energies. ÉS gained its initial experience and expertise in geothermal energy through the Soultz-Sous-Forêts project, subsequent to which it made deep geothermal energy a major driver for developing its business with industry and local authorities and helping them in their energy transition process.
- **Roquette**, a worldwide family-owned group specialized in the processing of plant-based raw materials into products for the pharma, nutrition, food, and selected industry markets. The Group is committed to sustainable development and profitable growth serving its customers and consumers globally.
- **La Caisse des Dépôts** is a public group serving the public interest and the country's economic development. Its missions include supporting 4 strategic transitions for France's long-term growth. These comprise regional, ecological and energy, digital and demographic and social transitions.

The 3 partners have formed a joint venture for carrying through the project, with 40% held by ÉS, 40% by Roquette and 20% by the Caisse des Dépôts.

Additional funding to reach the total of €55 million was provided by subventions and guarantees provided by 2 major public agencies:

ADEME, The French Environment and Energy Management Agency, a state-run organisation responsible for ecological transition, contributed €25 million to the project, through the Fonds Chaleur, a fund dedicated to financing local renewable-energy development projects.

ADEME also provided guarantees of €13 million to cover against geological hazard, the risk of insufficient resources following drilling operations.

The Région Grand Est was seeking to emphasise its support for the development of deep geothermal energy as a power source for the future for the region. It provided the remaining guarantees, amounting to €2 million, to cover against geological hazard.

Work on the site started in 2012 and comprised 3 major stages: drilling the first borehole, which confirmed the thermal potential, followed by the second borehole and then the construction of a 15 km loop for transporting the heat to the Roquette site in Beinheim.

This was a large-scale project, run to the highest standards of quality and safety and encompassing every environmental and societal aspect, including archaeological digs along the length of the pipeline loop. The project was also an opportunity for local and national companies to showcase their expertise.

The plant is now operational and has shown the maturity of the environmentally-friendly Enhanced Geothermal System (EGS) technology developed by ÉS, which meets the 3 partners' requirements for sustainable and profitable growth:

- Annual output of 24 MWth, or 190 000 MWh of thermal energy, enough to heat some 27,000 homes. It allows Roquette Beinheim to reduce annual CO_2 emissions by 39,000 tonnes, the equivalent of the emissions of 25,000 cars over 12 months.
- Along with a fuelwood biomass boiler, and an installation for the production of biogas, it allows the site to cover 75% of its steam needs with renewable energy sources.
- With non-intermittent geothermal energy available 8,000 hours per year, it provides Roquette Beinheim with a secure source of energy at a controlled cost.

The successful outcome of the project confirms deep geothermal energy's role in energy transition and as a growth driver for the sustainable development of the region. It also helps raise the region's profile, both domestically and internationally, through the emergence of a source of technical and scientific excellence supported by unique skills and expertise.

DO LEDS CREATE EMFS? LOOKING INTO THE SCIENCE BEHIND EMFS

Electromagnetic frequencies (EMFs) are a hot topic in wellness circles, but how much do we really know about the effects of EMFs on our minds and bodies?

We wanted to learn more about EMFs generally, and learn whether our wi-fi, Internet of Things and cellphones are actually harming us. But we were especially curious as to how EMFs relate to LED lights: we use LEDs in our home and espouse the values of these super efficient lighting options across our network and in our lives. So we did some digging on this controversial topic. And what we found was… shockingly inconclusive.

Could we be Wrong about EMFs?

Before we dive too deeply, I want to first discuss my thoughts on this.

While concerns about EMFs can seem a bit irrational– the topic is considered a fringe concern, or one that is 'just in your head'– I want to explain that I'm open to the idea that the medical and research community doesn't always have all the answers. I'm also open to the idea that we are at the horizon of this research, and thus results are inconclusive, or worse, are being stifled by industry influence. I'm a healthy skeptic, just like Mark Gibbs of Network World. He asks, "Will we look back (sadly) in fifty or a hundred years and marvel at how Wi-Fi and cellphones were responsible for the biggest health crisis in human history?"

EMFs is a new topic, and I'm really curious to learn as much as I can about it, and I'm generally inclined to believe that yes, our natural systems are being disrupted by excess light, sound, and frequencies in ways we just cannot yet fully explain. With this in mind I dug into the research, and this is what I found.

What are the Problems with EMFs?

A recent article in CommonGround magazine examines the dangers of EMFs in the home, and how it can upset sleep patterns, brain functioning, inspire headaches, damage digestive health, and – at its most basic– really mess up our cellular functions (that is, body cells, not cell phones).

Author Jeromy Johnson of EMFAnalysis.com, wrote, "Items such as solar inverters, CFL and LED lighting, dimmer switches and smart meters will cause 'dirty electricity' by putting additional frequencies onto the wiring in your home." Johnson suggests that while there are ways to reduce this type of 'pollution' he really recommends avoiding these (super energy efficient) technologies entirely. It seems that Johnson is truly suffering with this sensitivity, for which I am deeply sympathetic. And while some research (see more about that below) indicates that EMFs do emanate from wi-fi routers, smart meters and cellphones, his take on LED lights is pretty questionable.

In a comment on his site he writes: "The best bulb from a low-EMF point of view is the incandescent." While he does link to the breakthrough technology at MIT that might help improve the efficiency of incandescents, it does seem strange that the most energy efficient forms of lighting– ones that require less electricity to be used around the home and thus require less coal power plants or fossil fuel energy to create– are somehow better.

It's no secret that there are fossil fuel industry trolls out there looking to dissuade us from supporting efficiency measures, so it makes me wonder if this is somehow behind Johnson's claims. In addition, in field testing with a Gauss Meter, Scott Cooney (of Hawaii-based green home service Pono Home) found zero EMFs emitting from any of the hundreds of LED bulbs his company installs for customers.

Research on EMFs and LED lights

As with information about EMFs generally, information about EMFs and LEDs is very scant.

Creating Healthy Homes suggests that the only reason LEDs could produce EMFs is with the creation of 'dirty electricity,' which some LEDs allegedly produce, depending on their configuration. They write that, "If an LED bulb has a switched mode power supply, it usually produces dirty electricity but not always. [The] problem with switched mode power supplies is that they reduce voltage and convert from AC to DC by squaring off the sine wave of 60 Hz AC electricity, thereby producing harmonics of dirty electricity as a side effect. These harmonics then radiate off circuits in your walls running throughout the house and from AC power cords that you plug into outlets."

Another site, Electriclear, quotes from the Electromagnetic Fields *by B. Blake Levitt that,* "Light Emitting Diode (**LED) bulbs are far cleaner [and] emit no EMFs."** But later on their page, they write that "LEDs are **extremely low EMF**; they do have a small transformer which reduces the voltage to the device, although electriCLEAR uses 'line-voltage' LEDs which have no transformer and are truly zero EMF."

Another source I found about the LED-EMF connection was Natural News, which is not a site I use as a reference very often as they tend toward alarmist. They state that, "LEDs […] do not create EMF dirty electricity–" which is the opposite of what these other sources claim.

With the exception of Natural News, most of the information about the EMF-LED connection is that the 'research' comes from sites that are offering services related to such topics.

What does the Research say about EMFs Generally?

Most of the information available on the internet about EMFs and consequent illness is anecdotal and contradictory. There is some science behind the relationship between EMFs and health issues, but it's pretty limited. Here's what seems the most legit:

- A report showing that EMFs and other types of radiation are a serious concern for children was met with acceptance, as explained by Network World. Forbes has some common sense guidelines for reducing exposure to radiation for children.

- Multiple studies link to EMF concerns as it relates to smart meters, although this too is often contradictory and inconclusive. As reported by the Huffington Post, "a 2011 report by the California Council on Science and Technology concludes, 'Exposure levels from smart meters are well below the [FCC's established standards] for such [health] effects,' and 'There is no evidence that additional standards are needed to protect the public from smart meters.'"
- The journal Nature explains in a 2015 article (in very dense scientific terms), that perhaps "man-made/ polarized EMFs do trigger biological effects," but they do not go so far as to make recommendations or state real-world examples of concerns.
- The National Institute of Environmental Health Science says: "At present, the weight of the current scientific evidence has not conclusively linked cell phone use with any adverse health problems, though scientists admit that more research is needed"
- The WHO states that while "The electromagnetic fields produced by mobile phones are classified by the International Agency for Research on Cancer as possibly carcinogenic to humans [and] studies are ongoing to more fully assess potential long-term effects of mobile phone use." However, "To date, no adverse health effects have been established as being caused by mobile phone use." In fact, a 2010 study showed that overuse could be linked to cancer while less-than-average use could be protective, although this too was very contradictory (obviously) and inconclusive.
- Recently a huge study was completed by the National Toxicology Program finding that, in fact, cell phone radiation can be linked to certain types of brain cancers. However, even this prestigious research came under scrutiny due to some confounding factors. However, most researchers seem confident that this uptick in brain cancers (based on rat studies, poor little rats), could represent a big problem for the population.
- In a 2015 article, Mother Jones discusses a letter from 195 scientists from 39 countries calling, "the United Nations, the World Health Organization (WHO), and national governments to develop stricter controls on these and other products that create electromagnetic fields (EMF)." The letter states that peer-reviewed, published research has shown 'serious concerns' regarding the increased exposure to EMF generated by electric and wireless devices, although Slate looks more closely at how this message should be interpreted, saying that there is **possibly** a connection, but it is too weak for conclusive evidence.
- The US Center for Disease Control (CDC) states that at this time there is no evidence to show that using a cell phone causes cancer, but they do offer tips to use your phone in a safer way.

And in Conclusion..?

As I wrote previously here on *Green Living Ideas,* there is not real evidence proving OR disproving that EMFs generally (or EMFs from LED lights) are really dangerous:

Conspiracy theories abound about the electrosmog that surrounds us, and the potential dangers to our health.

The National Institute of Health states that while there are still speculative concerns about the connection between EMFs and health issues, current research continues to point to a weak association between EMFs and purported ills. However, both the NIH and the World Health Organization concur that ***more research is needed as scientists have not yet conclusively determined that EMFs are NOT linked to various cancers and health problems.***

NIH also reminds us that the strength of EMF radiation is strongest at the source, so to reduce exposure, keep electronics off of the body, and try to keep a distance between electrical appliances and outlets around the home.

One of the things I found most interesting was a study from the Journal of Psychosomatic Research that discovered that those dealing with 'environmental intolerance' around electromagnetic issues tended to have higher tendency towards behaviours such as obsessive/compulsive behaviour, interpersonal hypersensitivity, hostility, phobic anxiety, and paranoid thoughts.

Does this mean that everyone feeling electrosensitivity is making it up? Not necessarily, but it also doesn't mean that we need to chuck our smart meters, cell phones, and we probably shouldn't trash our LED lights either. But it does mean that publications like CommonGround shouldn't publish articles like Johnson's as fact with little to no evidence backing it up. I think that there is some caution that needs to be taken into consideration when dealing with electricity of any type near our bodies, and that as always, more research is needed.

Courtesy : by Andrea Bertoli,GBE,http://greenbuildingelements.com/2016/06/09/leds-and-emfs/

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பொதுப் போக்குவரத்தின் எதிர்காலம்: டிரைவர் இல்லாத பஸ்!

டிரைவர் இல்லாத கார் உபயோகம் பரவலாக சில நகரங்களில் அறிமுகப்படுத்தப்பட்டு செயல்படுத்தப்படுகிறது. பல்கலைக்கழக வளாகங்கள், சுற்றுலா மையங்கள் உள்ளிட்டவற்றில் இதுபோன்ற வாகனங்கள் இயக்கப்படுகின்றன. இவை பெரும்பாலும் பேட்டரியால் இயக்கப்படுகின்றன. இதனால் சுற்றுச் சூழலுக்கும் பாதிப்பில்லை.

தற்போது பொது போக்குவரத்துக்கென 12 பேர் பயணிக்கக்கூடிய மினி பஸ் பின்லாந்தில் சோதனை ரீதியில் இயக்கப்படுகிறது. அமெரிக்காவில் வாஷிங்டன் நகர தெருக்களிலும் இத்தகைய பஸ்கள் இயக்கப்படுகின்றன. இந்த ஆண்டு இறுதியில் லாஸ் வேகாஸ் மற்றும் மியாமி உள்ளிட்ட பகுதிகளில் இயக்கப்பட உள்ளது. **ஓலீ** (Olli) என்ற பெயரிலான இந்த பஸ் மணிக்கு 25 கி.மீ. வேகத்தில் செல்கிறது. இந்த மினி பஸ் டிரைவர் இல்லாமல் இயங்குவதற்கான தொழில்நுட்ப உதவியை **ஐபிஎம்** நிறுவனம் அளித்துள்ளது. **வாட்சன் காக்னிடிவ் கம்ப்யூடிங் சிஸ்டம்** என்ற பெயரில் இது செயல்படுகிறது. இது ஐபிஎம் சூப்பர் கம்ப்யூட்டர் கட்டுப்பாட்டில் செயல்படுகிறது. இதில் 30 உணர் கருவிகள் (சென்சார்), காமிரா, ஜிபிஎஸ், லிடார் எனப்படும் ஒளி பட உணர் கருவி உள்ளிட்டவை உள்ளன.

எதிர்காலத்தில் பொது போக்குவரத்தில் இத்தகைய மினி பஸ்கள் பெரும் புரட்சியை ஏற்படுத்தும் என்று நம்பப்படுகிறது.

மொபைல் போன் உதவியோடு இந்த பஸ்ஸில் நீங்கள் ஏறி, இறங்க முடியும். வழக்கமான பஸ் போலல்லாது உங்கள் வீட்டிலிருந்து அலுவலகத்துக்குச் செல்வதற்கு இதைப் பயன்படுத்தலாம்.

இந்த பஸ்ஸில் ஏறியவுடன் பயணிகளின் கேள்விகளுக்கு பதில் அளிக்கும் வசதியும் செய்யப்பட்டுள்ளது. சிறந்த உணவகம் எங்கே

உள்ளது? அப்பகுதியில் உள்ள முக்கியமாக பார்க்க வேண்டிய புராதன இடம் எது? என்பன போன்ற கேள்விகளுக்கும் பதில் கிடைக்கும்.

மேலும் ஒலீ வாகனம் மற்றெந்த வாகனத்தை விடவும் மாறுபட்டது. பேட்டரியில் இயங்குவதோடு அது தானாக செயல்படக் கூடியது. செயலி மூலம் இது செயல்படக் கூடியது. இதற்கான தொழில்நுட்பத்தை ஐபிஎம் நிறுவனத்தின் வாட்சன் அளித்துள்ளது. ஓலீ மினி பஸ் செயல்பாட்டுக்கு வருவதற்கு 100க்கும் மேற்பட்ட நிறுவனங்கள் பின்புலமாக இருந்துள்ளன.

இந்த மினி பஸ்ஸை வடிவமைத்தவர் **எட்கர் சார்மைன்டோ** என்ற 22 வயது இளைஞர். 2014-ம் ஆண்டு கொலம்பியா பல்கலையில் தொழில்துறை வடிவமைப்பு பயிலும்போது **பொகடா வடிவமைப்பு நிறுவனத்துக்காக** இந்த முப்பரிமாண (3-டி) பிரின்டர் மினி பஸ்ஸை உருவாக்கினார். இந்த பஸ் வடிவமைப்பு மிகச் சிறந்த வடிவமைப்புக்கான விருதை பெர்லினில் பெற்றுள்ளது. இந்த பஸ் பிளாஸ்டிக் மற்றும் பிற கூட்டுக் கலவையால் உருவாக்கப்பட்டது.

இந்த வடிவமைப்பை அரிசோனா மாகாணத்தைச் சேர்ந்த லோக்கல் மோட்டார்ஸ் நிறுவனம் ஏற்று 3-டி பிரிண்டர் காரை உருவாக்கியது. இந்தக் கார் மாடலில் வியந்து போன லோக்கல் மோட்டார்ஸ் நிறுவன தலைமைச் செயல் அதிகாரி ஜான் பி ரோஜெர்ஸ் ஜுனியர், இதை உருவாக்குவதாக உத்தரவாதம் அளித்தார். அதன் அடிப்படையில் உருவானதே ஓலீ.

இதேபோன்று 10 லட்சம் வாகனங்களை உருவாக்குவதே இவரது நோக்கமாம்.

இந்த நிறுவனம் உருவாக்கிய பெரும்பாலான வாகனங்கள் இந்நிறுவன பணியாளர்களால் உருவாக்கப்பட்டவை அல்ல. புதிய வடிவமைப்பாளர்கள் உருவாக்கும் மாடலை கொண்டு தயாரிப்பதே இந்நிறுவனத்தின் உத்தி என்கிறார் இந்நிறுவனத்தின் உத்திகள் வகுக்கும் பிரிவுக்கு தலைவரான ஜஸ்டின் பிஷ்கின்.

இவ்விதம் வடிவமைக்கப்பட்ட டிசைன்கள் வர்த்தக ரீதியில் வெற்றி பெறும்போது ஒவ்வொரு வாகன மதிப்பிலும் ஒரு சதவீதம் முதல் 2 சதவீதம் வரை உருவாக்கியவருக்கு ராயல்டியாக இந்நிறுவனம் அளிக்கிறது.

இதுவரையில் இந்நிறுவனம் 12-க்கும் மேலான வாகன டிசைன்களை உருவாக்கியுள்ளது. அவற்றில் சில மட்டுமே வர்த்தக ரீதியில் வெற்றி பெற்றுள்ளன. இதற்கு முன் பேட்டரியில் இயங்கும் மூன்று சக்கர சைக்கிளை இந்நிறுவனம் அறிமுகப்படுத்தி 1,500 டாலர் என விலை நிர்ணயித்தது. இவை 1,500 மட்டுமே விற்பனையானது. இதே போல ஒரு லட்சம் டாலர் விலையில் அறிமுகமான ராலி பைட்டர் என்ற வாகனம் 100 மட்டுமே விற்பனையானது. இதனால் இவை இரண்டின் உற்பத்தியையும் இந்நிறுவனம் நிறுத்திவிட்டது.

லோக்கல் மோட்டார்ஸ் நிறுவனத்தைப் பொறுத்தமட்டில் மக்களுக்கு பயன்படும் வாகனங்களைத் தயாரித்து அளிப்பதுதான் பிரதான நோக்கம். போர்ஷே நிறுவனத்தைப் போல ரகசியமான பரிசோதனை தளம் கிடையாது. கூகுள் நிறுவனம் அறிவித்ததைப்போல டிரைவர் இல்லாத கார், ஆனால் இதுவரையில் சாலையில் ஓடவில்லை. ஆப்பிள் நிறுவனம் போல தொழில்நுட்ப பின்புலமும் கிடையாது. இந்த சமுதாயத்திலிருந்து பெற்றதை மக்களுக்குக் கொடுப்பதே நோக்கம். அந்த வகையில் மாணவர் வடிவமைத்த டிசைன் இந்த மக்களுக்குப் பயன்பட வேண்டும் என்பதற்காக இதை உருவாக்கியதாக ரோஜெர்ஸ் குறிப்பிட்டுள்ளார்.

இது ஒன்றும் டெஸ்லா காரைப் போன்ற அதிக விலை கொண்டதும் அல்ல. பொது போக்குவரத்துக்கு கட்டுபடியாகும் விலையில் சுற்றுச் சூழல் பாதிக்காத வகையில் இருக்க வெண்டும் என்பதே நோக்கம். அதை ஓலி நிறைவேற்றும் என நம்புவதாக ரோஜெர்ஸ் குறிப்பிட்டார்.

100 வாகனங்களுக்கான ஆர்டர் கிடைத்தது. இதில் வடிவமைத்த சார்மைன்டோவுக்கு 28 ஆயிரம் டாலர் தொகை ராயல்டியாக கிடைத்துள்ளது. இத்தாலி நகரில் பொது போக்குவரத்து வாகன வடிவமைப்புப் பணியில் இவர் ஈடுபட்டுள்ளார். அதற்கான ஆர்டர் கிடைக்கும்போது இவருக்கான ராயல்டி தொகை அதிகரிக்கும்.

இந்த மினி பஸ் மீதான ஆர்வம் பல தரப்பிலும் அதிகரித்துள்ளது. 500-க்கும் மேற்பட்ட நிறுவனங்கள் தங்கள் ஆலை வளாகங்களில் இத்தகைய மினி பஸ்ஸை இயக்க விருப்பம் தெரிவித்துள்ளன. அடுத்த ஆண்டில் 100 பஸ்ஸை தயாரித்து அளிக்கமுடியும் என லோக்கல் மோட்டார்ஸ் நிறுவனம் தெரிவித்துள்ளது.

புதிய கண்டுபிடிப்புகளுக்கு எப்போதும், எங்கும் வரவேற்பு இருக்கும். அந்த வகையில் பொது போக்குவரத்தில் முக்கிய திருப்புமுனையை ஏற்படுத்தும் ஓலீ-க்கு அனைத்து நாடுகளிலும் சிவப்புக் கம்பள வரவேற்பிருக்கும் என்பது நிச்சயம்.

Courtesy: தி இந்து, 19.09.2016

"Standards only move in one direction. At the beginning of the world, standards were established and they've been slipping ever since." - EDWARD STEVENSON

TECHNICAL SEMINAR – SUMMARY

KOEL - " M/s KOEL (Kirloskar Oil Engine Limited) along with their GOEM, Genlite Engineering Pvt Ltd conducted a technical seminar on KOEL Green DG sets on 20 Aug 2016 for the benefit of TNEIEA members.

The technical seminar was conducted by TNEIEA along with their AGM.

Mr. P.L. Kasi, National Head, HHP DG sets briefed the attendees on the new product ranges being offered by KOEL Green which has now 750 KVA and 1010 KVA. He also narrated the audience on the highlights of their products which has unique features like KRM, (Kirloskar Remote Monitoring) and O2E Technology for optimization of fuel consumption. KOEL has the strongest service network in the country with an average service dealer available within 30-40 Kms.

All higher KVA DG sets are manufactured by KOEL at the state of the art manufacturing facility (factory constructed by TOYOTA) available at KAGAL. Mr. P.L. Kasi requested the members to follow the Guidelines given by them for getting the best out of the DG sets as each and every installation aspect is important and has a direct impact on the performance of the DG set. M/s Genlite Team has got latest type of load analyser available with them for helping our members to conclude on actual requirement of DG sets depending on the load. They shall do the load analysing on free of cost basis. M/s Genlite can be called on 9443681901/044-23740766.

HAGER - We had invited Hager to take part in our Technical Seminar. They took this opportunity accepted and gave us a useful presentation during the event. They made a nice display of all their products and explained the features and benefits to the visitors. They introduced their newly launched Modular Switches – Insysta to all of us. It is understood that Insysta is a Premium range of Modular Switches which is a compliment to all prestigious projects. The range comes with basic White and Black Mechanisms and Frames and also Aluminium Frames. Adding to this Insysta has Real Finish Materials like Black & White Mirror, Stainless Steel, Slate & Teak Wood only in Mounting Plates. Apart from Insysta, Hager explained their other solutions – Novello+ enclosures, h3 MCCBs, Manual Changeover Switches, Automatic Transfer Switches, Detectors, ACCLs, and also their well-known and well accepted MCBs & RCDs. Overall it was a pleasant experience to both our association and Hager. We trust our supports to Hager and relation with Hager will continue for a long time.

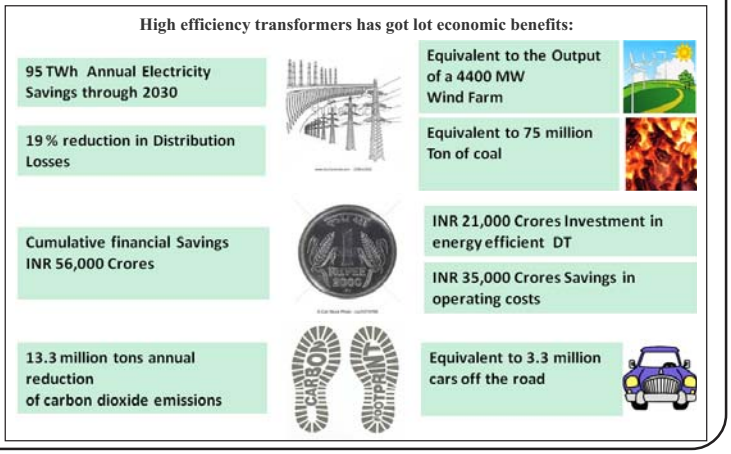
INTERNATIONAL COPPER ASSOCIATION - Distribution Transformers - Energy Efficiency & Reliability. Transformers play a vital role in the power distribution network. It is one of the higher loss making equipment in electricity networks. Failure of a transformer causes sudden stop in the power supply, also in industrial production. India is the world's Third largest Transformer Market. (2013-14). Distribution 80,000 MVA. Power – 1,78,000 MVA. More than 5 million distribution transformers powering 400 million kVA. Total distribution transformer assets valuation > INR 50,000 Crores. Distribution Transformer failure rate ~ 13%. Approx. 70% repaired, balance replaced. Approx. additional cost to distribution sector - INR 5,000 Crores. Due to Urbanization the demand for distribution transformers has been increasing at a rapid pace. Reduction in transmission and distribution losses and providing reliable uninterrupted power supply has been priority of any government.

BIS – IS 1180 2014 - 1 Scope - This standard specifies the requirements and tests including standard loss levels of mineral oil- immersed, natural air-cooled, outdoor type, double-wound distribution transformers for use in power distribution systems with nominal system voltages upto and including 33kv and of following types and ratings:

a) Three phase ratings up to and including 200 kVA both non-sealed type and sealed type.
b) Three phase ratings higher than 200 kVA, upto and including 2500kVA both non-sealed type and sealed type.
c) Single phase ratings up to and including 25 kVA sealed type.

BEE – 5 star labeling for Distribution Transformers.

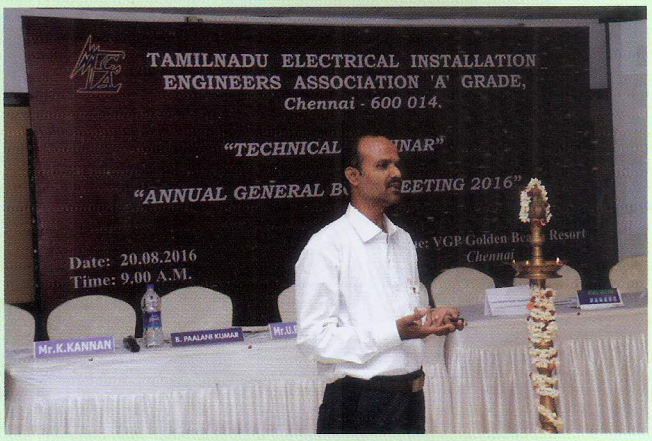
1 star to 5 star classification based on the Total losses at 50% and 100% loading.



TECHNICAL SEMINAR PHOTOS - 20.08.2016

Technical Papers by
Mr. Rengasamy Venugopal, *Regional Manager - South, Hager Electro Pvt. Ltd.*

Technical Papers by
***Mr. P.L. Kasi**, National Head, Genlite Engineering Pvt. Ltd.*



*Technical Papers by **Mr. S. Basker**,*
Consultant - EE Motors Program
International Copper Association

*Technical Papers by **Mr. N. Prasanna Venkatesh,***
Vertical Head –Projects-Tamilnadu,
Syska LED Lights Pvt. Ltd.

*Technical Papers by **Mr. G. Suresh,***
State Head – Tamilnadu
Orbit Switches

Jyothi Enterprises - Display

Bentec India Ltd - Display

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Bentec India Ltd - Display

Bright'N Power - Display

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Hager Electro Pvt. Ltd. - Display

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EDA Future Tech - Display

EDA Future Tech - Display

EDA Future Tech - Display

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LESSONS LEARNED ALONG EUROPE'S ROAD TO RENEWABLES

Visitors to Denmark are often taken by the ubiquitous wind turbines, which tower above the land and sea. On one windy day in December 2013, these turbines provided more electricity than the entire nation could use—a first for Denmark or any country.

While that day was exceptional, wind met 39 percent of Denmark's electricity needs last year, the highest share of any nation. And wind isn't Denmark's only renewable energy source; the country has also been investing heavily in biomass power plants that burn woody material and straw and in biogas tanks that capture methane from organic material to produce electricity. Add in solar arrays and renewable sources accounted for 60 percent of Denmark's electricity in 2014, according to Energinet, the company that operates the Danish electricity and gas grids.

Of course, Denmark is not alone in its drive to harness more renewable energy. Portugal last year met 30 percent of its electricity demand with nonhydropower renewables, and Spain reached 27 percent. Together, these three nations are leading Europe's clean energy revolution. (Germany, meanwhile, has also invested heavily in solar and wind power, but the share of electricity it gets from renewable sources lags that of Denmark, Portugal, and Spain; see "Has Germany's Energy Transition Stalled?")

These three countries overcame the technical challenges of integrating intermittent solar and wind sources into their grids; additionally, Spain and Portugal have improved the overall reliability of their power systems, while Denmark has maintained a highly reliable grid. Considered together, the three countries show that no special geography is required for switching to renewables. The fact that solar and wind technologies have become much cheaper and more efficient in recent years did not play a significant role (although it didn't hurt). Instead, in all three cases, a deliberate energy policy has been the key driver.

Denmark: The pioneer

Photo: Siemens This static var (volt-ampere reactive) compensator on the Danish island of Lolland helps stabilize the low-power transmission system in the south of Denmark. Maintaining a stable grid has been a high priority with the widespread deployment of intermittent wind-generated electricity throughout the country.

Europe's energy transition began in Denmark, which embraced wind power and other renewable sources decades before any scientific consensus on man-made climate change emerged. What motivated the Danes was the country's overdependence on fossil fuels.

In 1973 and again in 1979, skyrocketing oil prices hit many countries around the world. Denmark, where imported petroleum met 90 percent of energy needs, was particularly pained. The Danish government at first considered building nuclear power plants, but this idea proved unpopular. Paul Gipe, the author of more than a dozen books on wind and renewable energy policy, has studied the Danish experience extensively. He says members of Denmark's antinuclear movement began building small, locally owned wind turbines as an alternative.

"There was a citizens' movement to develop wind energy, and it got ahead of the government," says Gipe. "The citizens' movement said if the government is not going to take action in developing wind energy, we will take control in our hands. We will build the turbines and connect them to the grid."

Federal policies responded to this development in various ways. In 1985, for instance, the Danish government began a program to subsidize 30 percent of the cost of installing wind turbines and other renewable energy sources; later it required that utilities purchase this electricity at an agreed price, with a bonus from its carbon tax.

These policies in turn gave rise to Denmark's wind industry, led by homegrown manufacturers such as Vestas Wind Systems, Nordtank Energy Group (which later merged with NEG Micon and then Vestas), and Bonus Energy (which was acquired by Siemens). Danish wind turbines became progressively larger and more sophisticated and were deployed widely throughout the nation.

Other countries had support for research and development and universities," says Birger T. Madsen, who was chair of the Danish Wind Industry Association in the 1980s. "Denmark was the only nation to have direct market stimulation. It took 10 years before all the other European countries caught up with that model."

Another turning point came in 1993, with the establishment of what's known as a standard offer policy. This nationwide policy increased the payment levels to wind projects and provided support equally across the nation. As a result, Danish wind capacity grew sixfold, to 3.1 gigawatts, over the next 10 years.

Of course, wind is the most variable electricity source, and its output is hard to forecast. In any electricity system, supply and demand must be balanced, and this is harder to do when the electricity supply is continuously changing and you have limited visibility as to how much power will be available. Reliably integrating large amounts of wind generation into the grid thus presented a technical challenge. Grid interconnections with neighbouring countries proved vital because they allowed Denmark to send excess power abroad on windy days and to import power in times of low wind—a much less expensive solution than available forms of energy storage. Indeed, the nation has one of the highest degrees of regional interconnection in the world, with a series of high-voltage power lines running under the icy waterways that separate it from Sweden and Norway, as well as overland transmission to Germany. Through Scandinavia's regional power market, Denmark trades electricity with Finland, Norway, and Sweden in intervals of less than an hour.

Danish grid operators were skeptical at first about their ability to export and import so much power so quickly, but they soon realized it was feasible. In 2003, for instance, the chairman of Western Denmark's grid operator noted that although the company had feared its system could not handle wind capacity above 500 megawatts, it was by then handling nearly five times as much.

As a result, even though renewables now provide 60 percent of Denmark's electrical generation, its grid is markedly more reliable than that of the United States. On average, the United States has three times as many outages as Denmark, with each outage lasting 14 times as long.

To be sure, Denmark's transition toward renewable energy has not been entirely smooth. In 2001, a center-right government took office; it changed the incentive structure for wind and removed the right of turbine operators to interconnect to the grid. By 2004, the building of new wind farms had ground to a halt, and very little new capacity was added over the next four years.

In 2008, in anticipation of the Copenhagen Climate Change Conference the following year, the same government began promoting large-scale wind deployments once again. The leftist coalition government that took power in 2011 has taken renewables even further, calling for 100 percent renewable energy in the electricity and heating sectors by 2035.

Spain: The roller coaster

Photo: Koza1983/WikipediaSpain has been a pioneer in the development and deployment of concentrated solar power technology, including the PS10 and PS20 solar towers at Abengoa'sSolúcar Complex, outside of Seville.

Spain was the next European nation to broadly embrace renewable energy. Like Denmark, it suffered in the 1970s due to its heavy dependence on imported petroleum. It did not immediately turn to renewables as an alternative, however. And in general, Spain has experienced far more ups and downs in its transition away from fossil fuels.

Spain's wind movement began in the northern region of Navarre, where in 1997, Spanish wind turbine maker GamesaCorporaciónTecnológica, Denmark'sVestas, and the regional government undertook a wind project of unprecedented size. Backed by the European Investment Bank, which handles loans for the European Union, the Guerinda project initially comprised 115 turbines totalling 69 MW—the largest in Europe at the time and the first of a series of even larger projects.

That same year, Spain implemented its version of a standard offer policy. The policy required that utilities purchase electricity generated by renewables and offered a premium for this power. Power companies such as Acciona, Endesa, and Iberdrola saw an opportunity to start building their own wind farms. "Endesa was manufacturing its own turbines and looking for places to put them," notes journalist Michael McGovern, who lives in Spain and has written extensively about its wind industry.

Spain's standard offer policy led to a 39-fold increase in wind capacity over the next dozen years, to 16.7 GW by 2008—far more than was deployed even in Denmark. For a time Spain was the center of the global wind industry and the largest market.

As in Denmark, Spanish grid operators doubted that they could integrate so much wind, in large part because Spain had very limited grid interconnections with its neighbours France and Morocco; its ability to trade electricity with Portugal was greater, but Portugal is a much smaller market. (In February Spain completed a high-voltage line to France that doubled its interconnection capacity with that country.)

As a solution, grid operator Red Elétrica de España (REE) built a centralized dispatch system and required that all wind farms operate under its control starting in 2006. According to McGovern, this was the first such system in the world, and it enabled the integration of large amounts of wind, from a negligible amount in 1995 to 20 percent of annual demand in 2014. McGovern recalls that prior to creating the centralized system, REE

had insisted that wind could not provide a maximum output equal to more than 12 percent of national electricity demand; these days, he notes, wind generation in Spain reaches a peak of more than 60 percent.

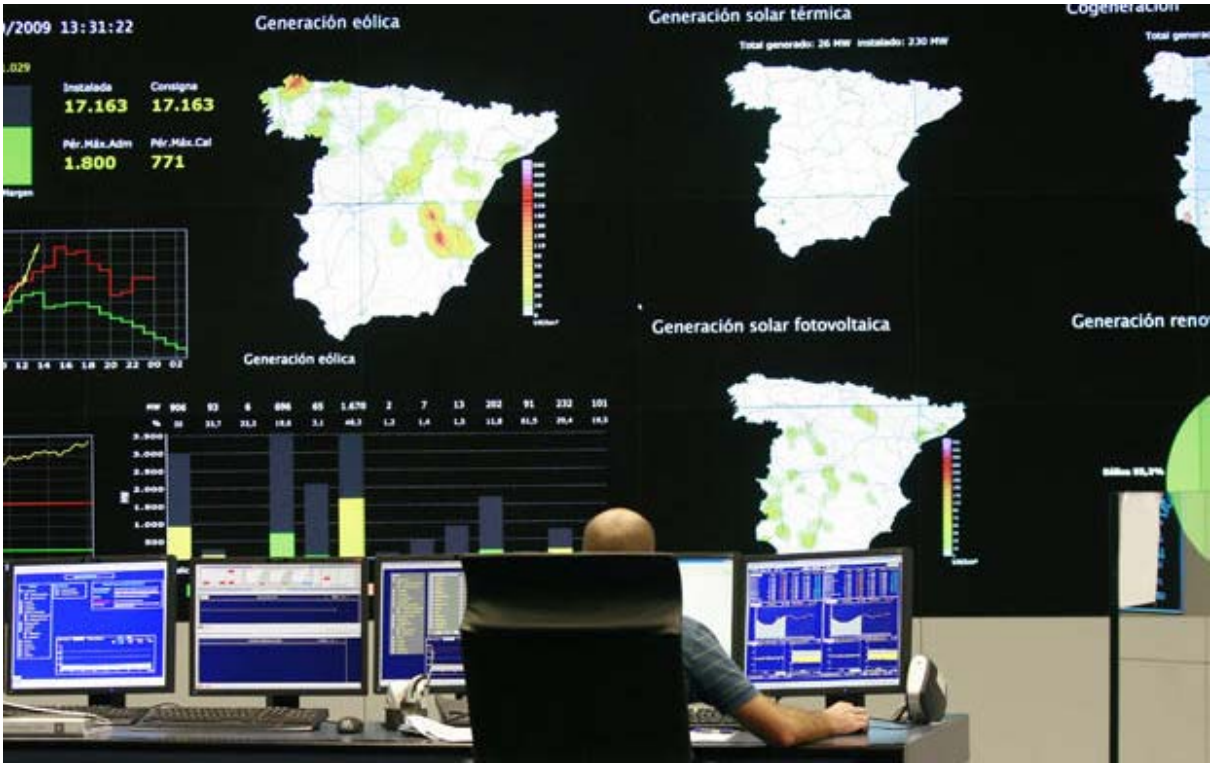

Photo: REETo ensure the smooth integration of wind energy into the national grid, the Spanish grid operator Red Elétrica de España created a centralized dispatch system that monitors and control wind turbines throughout the country.

Spain also invested heavily in solar photovoltaics, experiencing a solar boom in 2007 and 2008. New deployments were helped by a generous feed-in tariff that set electricity rates for renewable energy generators above their calculated costs. In 2008 alone, Spain installed more than 2.5 GW of PV, which at the time was nearly half of the global market. In addition, the feed-in tariff supported the construction of nearly 2 GW worth of large solar thermal electric plants.

Such huge deployments resulted in higher than expected costs to the electricity system, in large part because solar was much more expensive per unit of power delivered than was on-shore wind. An existing law that set limits on retail electricity rate increases further complicated matters; it required that the government pay for any shortfalls between a utility's revenues and its costs. This rate freeze led in 2009 to the Spanish electricity system running a deficit of 4 billion euros [pdf]—roughly 20 percent above its revenues.

This "tariff deficit" came at the worst possible time, as Spain was hit hard by the global recession beginning in 2008. The center-left government responded by introducing a series of retroactive reductions to feed-in tariff rates. When the center-right Popular Party came to power in 2012, it took even more drastic measures. Starting in January 2012, it froze all renewable energy incentives and a year later retroactively replaced the feed-in tariffs with an extremely complicated system that paid renewable energy producers far less.

These cuts halted renewable energy investments in Spain, and they now threaten to bankrupt tens of thousands of people who invested in wind and solar. This collapse in renewable energy deployment is particularly tragic given Spain's past leadership in wind and solar thermal technologies and its success in integrating large volumes of renewables in a geographically constrained system.

Portugal: The forgotten leader

Few people outside of Portugal know about its renewable energy transition, and yet it has also been a leader. In 2014, renewable sources supplied 63 percent of the country's electricity, according to Portugal's Renewable Energy Association (APREN).

Photo: Valter Jacinto/Getty Images Although Portugal has long benefitted from an abundance of hydroelectric power, the country has also expanded its wind, solar photovoltaics, biomass, and biogas installations, beginning in the mid-1990s. Portugal last year met 30 percent of its electricity demand with nonhydro renewables.

Well into the 1990s, Portugal imported fossil fuels for a majority of its electricity generation, until, like Denmark and Spain, it finally turned to renewables. However, unlike the other two countries, Portugal was less subject to oil-related price shocks because it gets a large portion of its electricity from hydroelectric dams, with a total capacity of 5.7 GW. Portugal's experience shows that even countries with substantial hydroelectric capacity can still benefit from deploying large amounts of nonhydro renewables.

In 1995, Portugal introduced a standard offer policy for renewables, two years after Denmark and two years before Spain. The policy has gone through multiple iterations since then; after the formula was changed in 2001, the nation's wind market grew 20-fold, to 4.1 GW, over the next decade. Additionally, Portugal has deployed 722 MW of biomass and biogas, including waste incineration, and 414 MW of solar PV.

As happened in Spain, the Portuguese electricity system became more reliable even as the share of wind generation grew. Likewise, the standard offer enabled utilities to participate in renewable energy production. The Portuguese utility Energias de Portugal, for instance, became a global wind and solar developer, with projects across Europe and North America and in Brazil. Additionally, electricity prices fell.

But in 2011, Portugal's energy transition fell victim to the global financial crisis. As a condition of Portugal's postrecession bailout, the International Monetary Fund and foreign lenders forced the nation to reduce or revoke several of its incentives for renewable energy. Independent power producers are also facing difficulties in connecting to the grid, owing to the grid's low capacity. However, some large projects are now moving forward; most notably, a consortium of Portuguese companies and Germany's Ferrostaal are building five large wind farms totalling 172 MW.

To the future

While Portugal, Spain, and Denmark have been leaders in the transition to renewables, they are not alone; most Western European countries are heading in that direction. A recent study by the International Energy Agency [pdf] shows that many countries can get up to 45 percent of their electricity from wind and solar

without substantially increasing system costs, provided that installations are appropriately integrated into the grid, investments are made in flexible generation, and energy market rules are reformed.

Photo: GesfinuThis plant in Mortágua, Portugal, produces wood pellets from sawdust for combustion in biomass plants. Biomass supplied 564 megawatts of electricity in Portugal last year.

At higher penetrations, energy storage may be necessary to balance fluctuations in supply and demand. Spain and Italy are currently deploying large-scale storage, whereas Germany has created incentives for homeowners to add batteries to their residential PV systems. If the past is any indication, the technical issues with energy storage will eventually be sorted out.

Far trickier will be the politics. The rapid deployment of large volumes of renewables requires both political will and a consistent policy. Yet, as noted above, even in those countries that have led the renewable energy transition, such support has not been consistent. In Western Europe, new governments, particularly conservative ones, have tended to undermine any strong renewable energy policies passed by previous governments.

Worldwide, the nations that have had the greatest success with renewable energy have introduced some form of standard offer policy, and dozens of countries now have them. In 2013, following the passage of feed-in tariffs, China and Japan deployed the largest volume of solar PVs in the world, and they continued to do so in 2014.

A number of studies have suggested how countries could eventually meet 100 percent of their electricity needs with renewables. What the experiences of Denmark, Portugal, and Spain show is that meeting a substantial portion of electricity demand with renewable energy is feasible now and does not depend upon a special geography, an existing set of circumstances, or widespread deployment of energy storage. What *is* needed is political will, effective policies, and a commitment to structuring the electricity system to support renewable energy. Whether other countries follow this lead is their choice to make.

About the Authors

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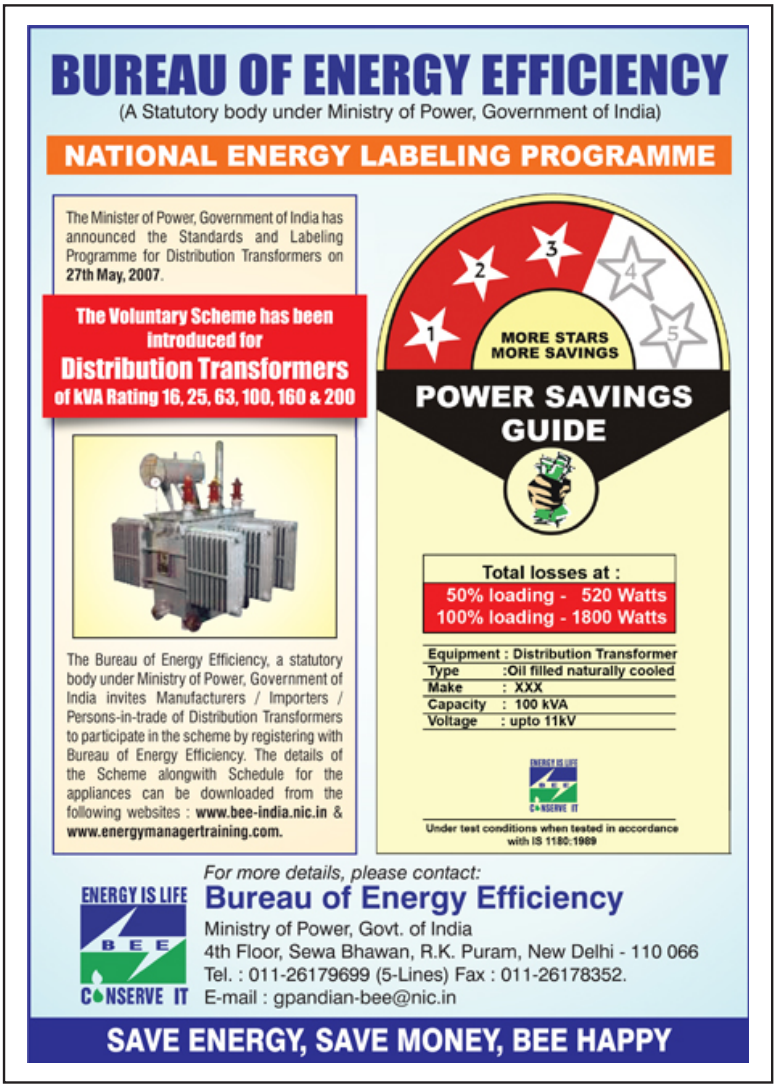
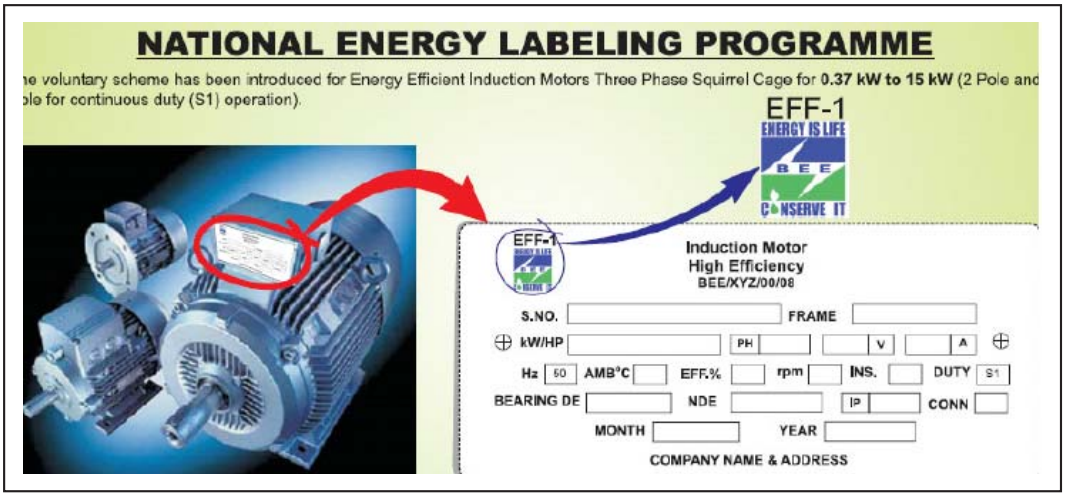
ENERGY CONSERVATION THROUGH ENERGY EFFICIENCY – 19

Standards & Labeling – Evolving Standards for Energy Efficiency and Labeling with "Stars" and other methods for communicating the levels of Efficiencies to the buyers and the consumers to achieve the objective of Energy Conservation through uses of Energy Efficient Equipments and Appliances:





In tune with the World Standards Day observed during the month of October, it will be appropriate to review the Standards and the Labeling Program in India with focus on Energy Efficiency and Energy Conservation.

As we have seen and analyzed in the earlier parts, the Efficiency levels of Equipments and Appliances with Electrical and Mechanical functions are decided basically by Materials, Design and Manufacture. Though the Bureau of Indian Standards (BIS) came into being soon after Independence, the concern for Energy and Energy Efficiency surfaced with the passage of Energy Conservation Act in 2001. Act empowers Bureau and Central Government to specify Energy Consumption Standards, prohibit manufacture or sale or import of equipments and appliances that do not meet the standards, require display of Energy performance labels on equipments and appliances.

Institutional frame work for regulation for Energy Efficiency:

BIS – National Standards Body for Formulation & Implementation of National Standards, Production certification, Quality system certification, EMS certification etc.

Bureau of Energy Efficiency (BEE), is established in 2002 to implement & monitor the Energy Conservation Act, 2001. One of the key thrust areas of EC Act, 2001 is Standards & Labeling Programme and BEE is formulated to function with the objectives of:

- Improve energy efficiency through various regulatory and promotional instruments
- Plan, manage and implement provisions under the EC Act
- Appliance standards and labeling
- Industrial energy benchmarks
- Energy Conservation Building Codes
- Monitor energy use in high energy-consumption units
- Certify and accredit energy auditors and energy managers
- Provide a policy framework and direction to national energy conservation activities
- Disseminate information and knowledge, and facilitate pilot and demonstration projects
- Formulation of Energy Efficiency Standards.
- Laboratories accredited by National Accreditation Board of Laboratories
- Educational Institutions.
- Manufacturers and Manufacturing Associations
- Consumer Organizations and so on.

Mission – S & L Programme when it was launched

To reduce overall energy consumption by use of Energy Efficient equipments/ appliances 18 BU by 2012 (~3000 MW) and Target an avoided capacity addition of over 3000 MW during XI plan of Govt. of India.

About Standards & Labeling Program

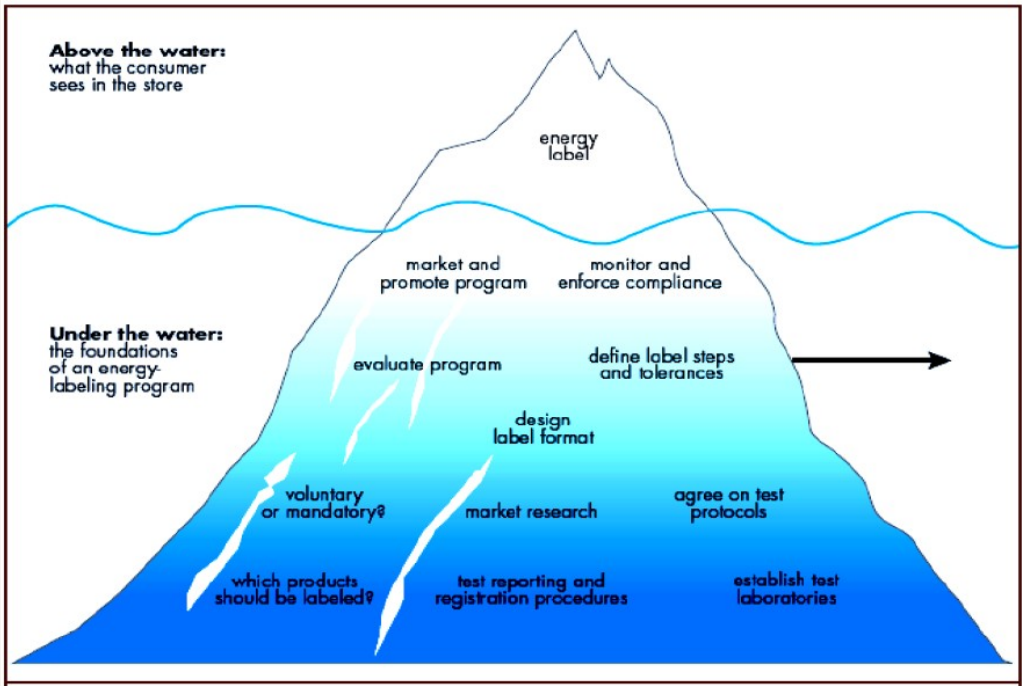
The Objectives of Standards & Labeling Program is to provide the consumer an informed choice about the energy saving and thereby the cost saving potential of the marketed household and other equipment. This is expected to impact the energy savings in the medium and long run while at the same time it will position domestic industry to compete in such markets where norms for energy efficiency are mandatory.

The scheme was launched by the Hon'ble Minister of Power in May 2006 and is currently invoked for equipments/ appliances - Room Air Conditioner, Ceiling Fan, Color Television, Computer, Direct Cool Refrigerator, Distribution Transformer, Domestic Gas Stove, Frost Free Refrigerator, General Purpose Industrial Motor, Monoset Pump, Open well Submersible Pump Set, Stationary Type Water Heater, Submersible Pump Set, Tfl, Ballast, Solid State Inverter, Office Automation Products, Diesel Engine Driven Monoset pumps for Agricultural Purposes, Diesel Generator Set, Led Lamps & Inverter Ac. As the Program progresses more and more Appliances, Industrial Products, Refrigeration and AC Systems are all planned to be added to the lists. The important achievement expected is substantial saving of Energy for the State and direct money saving for the consumers.

The coverage of Equipments, Appliances, Systems and Sectors covered and expected to be covered by the S & L Program as it goes along, is quite vast and almost encompasses everything in the area of Energy uses and passages. There are Benchmarking with efficient products leading Market to transform into Greener products

and objectives of Energy Conservation through more and more use of Energy Efficient Products. BEE deals with each product with elaborate Standards and levels of efficiencies and actual Energy Consumption levels and so on, which are also periodically updated or taken to improved levels as the R &D and Technologies progress.

In order to understand the kind of potentials for Energy Conservation through improved efficiencies of equipments and appliances, let us just analyze the Electrical Energy from its Generation to uses. In Electrical Energy, the coverage of S & L is almost complete as it even covers Distribution Transformers, Motors, Agri. Pump sets and so on apart from various appliances of all kinds including Air Conditioners, Water Heaters, Fans, Lights and almost everything.



Let us look at a situation of Generation of 1000 Billion Units per annum, which was the case just a year or 2 back. About 30 to 40% of this Energy is lost in Transmission and Distribution and further distribution losses about 10% within the Factory or Commercial premises or Houses. Based on all kinds of documents, deliberations and objectives set, it will be quite correct to assume that through use of better efficient equipments and appliances, it will be possible to get improvement of about 10% in the T & D (apart from further savings through improvements like HVDS – High Voltage Distribution Schemes etc) and about 12 to 20% through all kinds of appliances.

A broad estimate of Saving Potential:

10% saving in T&D Losses of say 350 Billion Units = 35 Billion Units / PA – Equivalent to a Generating Capacity of approximately – 4,500 MW

15% Savings in the 'End use' about 500 Billion Units = 75 Billion Units – Equivalent to Generating capacity of about 10,000 MW.

Total Generating capacity reduction through the modest estimate as above = 14,500 MW

In order to validate the above approximate calculations, let us look at one of the vastly used appliances – Ceiling and Table Fans. The annual sale of these are put at about 30 Million Units per annum. The total population of installed fans are about 600 Million. The Wattage of a fan is about 65 Watts, and presently we talk of efficient fans consuming only about 35 Watts etc (without any reduction on Air Delivery). Assuming a reduction of only about 10 W per fan and assuming an average running of about 50% of the 600 Million fans and for an average of 2 Hrs per day, the energy saving will work out to about 2.16 Billion Units per annum. Considering various mass usages like Lights, Heaters, ACs, Refrigerators, Pump sets and so on, 75 Billion Units savings look feasible.

With Standards and Labeling initiative and with ongoing stepping up of levels of efficiencies in tune with the Technology progress, there is enormous scope of energy saving and reduction in further Generating Capacity additions.

(To be continued)

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SHRI PINGALI VENKAYYA

Controversies continue to bog the actual history of the Indian National Flag. The Tiranga Jhanda as we see it today was a result of hard work and efforts made by a freedom fighter from Andhra, Pingali Venkaiah about whose life and times, very less is known and documented.

Venkaiah was born on 2nd August 1878 in Peddakallepalli village of Krishna district in Andhra Pradesh to Hanumantha Rayudu and Venkatarathnamma. He was their first child among half a dozen others. He spent the first five years of his life in the house of his maternal grandparents Tehsildar Chalapathi Rao and Seethamma.

After his grandfather got transferred to Bhatlapenumarru, a small village forty kilometers away from Vijaywada, Venkaiah was admitted to a local school for his primary education. For his high schooling, he was sent to 'Hindu High School', thirty-five kilometers away in Machilipatnam, then a big center for fishing and textiles. In Machilipatnam, Venkaiah spent his teenage and mastered among many things, the art of cultivating good cotton. This knowledge was to come of use later in his life. Inspired by Subhash Chandra Bose's call for an Indian Army, Venkaiah left for Bombay when he was nineteen to join the military services.

After training at the academy, he was sent on duty to Africa where he participated in the Boer War (1899 -1902). It was during his stay in Africa that he first met Mahatma Gandhi and came under the influence of his ideology. After his return from Africa, he became a member of the secret revolutionary units fighting against the British Raj and spent time in Eluru. His interest in farming and cultivating cotton consumed his time. He began experimenting in the area of agriculture. His academic interests took him to Lahore to study Sanskrit, Urdu and Japanese in the Anglo Vedic School.

Many years later in 1913, he was to give a full length speech in Japanese in Bapatla that made him famous as 'Japan Venkaiah'. The 1906, the 22nd session of the Indian National Congress took place in Calcutta, presided by Dadabhai Naroji. Four famous resolutions of Swadeshi, Boycott, National Education and Swaraj were passed in this session. Venkaiah was present and took inspiration from this in his own style. Seeing his earlier work, a highly impressed **Congress appointed him as a member of the executive meeting.** In that meeting his patriotic sentiments were deeply hurt watching the Union Jack being hoisted. He decided he would do something about it.

Back home in Eluru, he worked hard and developed an indigenous hybrid variety of cottonseeds. Importing the Cambodian variety from America and mixing them with Indian seeds, he created his own type. He acquired a piece of land in the nearby Chellapalli village and planted these seeds. A fine variety of cotton grew from these, which came to the notice of the local British officers during an agricultural exhibition in 1909. **The Royal Agricultural Society of London offered him an honorary membership. He became famous as 'Patti (cotton) Venkaiah' to everyone around.**

He joined the railway services as a guard and took posting in Bangalore and Bellary. Madras in those years was reeling under the plague epidemic. Seeing the plight of those suffering, he quit his job and went there to work as an inspector of the Plague Disease Eradication Organization briefly. He returned to his home and began working on designing a flag for India. **In 1916 he published a book titled 'A National Flag for India' which carried thirty designs of the flag.** Between 1918 and 1921, in every session of the Congress, Venkaiah raised the issue of having an own flag. He was working as a lecturer in the Andhra National College in Machilipatnam in those years.

On his visit to Vijayawada in April 1921 for a meeting of Indian National Congress, Venkaiah met Mahatma once again and showed him his publication with the various designs of the flag. This time Gandhi showed additional interest and asked him to make a fresh design that would be inspiring for every time and generation. Overnight Venkaiah designed the flag, which was formally approved by Gandhi in the National Congress Conference.

Expressing his views on Venkaiah's hard work in an article titled **'Our National Flag'** in Gandhi's own paper **'Young India'**, he wrote: *"We should be*

prepared to sacrifice our lives for the sake of our National Flag. Pingali Venkaiah who is working in Andhra National College Machilipatnam, has published a book, describing the flags of the countries and has designed many models for our own National Flag. I appreciate his hard struggle during the sessions of Indian National Congress for the approval of Indian National Flag. When I visited Vijaywada, I asked Mr Venkaiah to prepare a two coloured flag with red and green colours along with a Chakra symbol and obtained it within three hours from him. Later we had decided to include the white colour, also the colour that reminds of truth and non violence". **This shot Venkaiah to fame overnight and he was called 'Jhanda Venkaiah'.**

After 1947, he withdrew from active politics and settled down in Nellore. He began exploring another area of his academic interest: gemology. He had a keen interest in the precious and semi-precious stones available in this geographical region. He knew what kind of precious stones were available in each and every part of the country. He conducted regular field trips and even worked as an advisor to the Government of India.

Venkaiah published a series of well-researched articles that earned fame as 'Diamond Venkaiah'. This way Venkaiah earned fame for himself due to his expertise in various fields. He married Rukminamma and they had a daughter Ghantasala Sitamahalakshmi. His last days were spent in utter penury.

Before he breathed his last, he wrote his final wish in his will which was that his body had to be covered with the tri-colour he had designed. He instructed that it be removed after his body was placed on the pyre and later hung to a tree branch. When he passed away on July 4th 1963, his will was executed and the tri-colour fluttering on the tree branch was a witness to his soul soaring into the heavens. After that Venkaiah was forgotten for a long time. He received no awards for his contribution to India's freedom struggle. It was during the tenure of Prime Minister Lal Bahadur Shastry that his memory was resurrected on a trip to Vijaywada.

During the Chief Ministership of N T Rama Rao, a statue of Pingali Venkaiah was installed, along with thirty-three famous Telugu personalities on the Tank Bund that connects the twin cities of Hyderabad and Secundrabad over the Hussain Sagar Lake. A postage stamp and a First Day cover were released in his honour in 2009. *During the struggle of a separate Telangana State, seventeen of these statues were vandalized by insensitive mobs.*

REGULAR EXERCISE

10 – BENEFITS

1. Reduces Obesity
2. Reduces Cholesterol and Blood Pressure
3. Reduces Blood Sugar in Diabetics
4. Releases Endorphins
5. Relaxes you
6. Reduces Medication
7. Retards / Reverses Vascular Narrowing
8. Refreshes you
9. Requires no Money
10. Recommended World

BIG, BEAUTIFUL AND SUSTAINABLE – 10 OF THE WORLD'S MOST ENERGY EFFICIENT OFFICES - 3

DAVID & LUCILE PACKARD FOUNDATION HEADQUARTERS, CALIFORNIA (USA)

Located in California, USA the David and Lucile Packard Foundation Headquarters is the largest Net Zero Energy certified building in the world.

95% of the materials used to construct the building were sourced from pre-existing buildings that had been deconstructed. The building provides 100% of its own energy needs through on site resources including 915 rooftop photovoltaic panels. The design of the building means that it effectively uses daylight to supplement artificial light and reduce energy consumption. It also has extensive rooftop guttering and a living green roof that collects around 20,000 gallons of rainwater that can be used for irrigation and within the building's bathrooms.

(To be continued...)

THE WORLDS TOP 10 MOST INNOVATIVE COMPANIES IN ENERGY - 3

XL HYBRIDS

For wooing vehicle-fleet owners to adopt its emissions-reducing tech. XL Hybrids, a Boston-based startup spun out from one of MIT's petri dishes, retrofits fuel-thirsty vans and trucks with a more-efficient hybrid diesel-electric technology. It's a novel and hugely important strategy in reducing emissions. It's also a steadily growing business, as fleet owners that may be unswayed by environmental arguments opt for the XL retrofits to save on fuel costs. The company is currently working with FedEx and a host of local companies.

(To be continued...)

நீரிழிவுக்கு அற்புத மருந்து வெந்தயம்

சிக்கலான பிரச்சினைகளுக்கு எளிமையான தீர்வுதான் சிறந்த தீர்வு – ஆக்கம் ரேசர் என்ற ஆங்கிலேயத் தத்துவஞானியின் பொன்மொழி. இந்தப் பொன்மொழிக்கு ஏற்ப எளிதில் கிடைக்கக்கூடிய, விலைமலிவாக இருக்கக்கூடிய, பக்கவிளைவுகள் இல்லாத, நோய்களைக் கட்டுப்படுத்தும் வேதிப்பொருட்களைக் கொண்ட உணவுப்பொருளான வெந்தயம், பல்வேறு நோய்களுக்கு அருமருந்தாகத் திகழ்கிறது.

தற்போது உலகம் முழுவதும் அதிகமான மக்களைத் துன்புறுத்தும் நோயாக நீரிழிவு உருவெடுத்துள்ளது. இந்த நோயால் பலரும் பல்வேறு இன்னல்களை அனுபவித்து வருகிறார்கள். நீரிழிவு நோயைக் கட்டுப்படுத்தத் தினமும் மருந்து, ஊசி, மாத்திரைகளை வாழ்நாள் முழுவதும் எடுத்துக் கொள்ள வேண்டிய கட்டாயத்துக்கு உள்ளாவது, எல்லாருக்கும் உவப்பான ஒன்றாக இருக்காது.

இந்த நிலையில் நீரிழிவு நோயைச் சிறப்பாகக் கட்டுப்படுத்தும் தன்மை, வெந்தயத்துக்கு உள்ளது என்று மருத்துவ ஆய்வுகளில் கண்டறியப்பட்டுள்ளது.

வேதிப்பொருட்கள்

வெந்தயத்தில் நிறைய வேதிப்பொருட்கள் உள்ளன. அவற்றில் இன்சுலின் சாராத நீரிழிவைக் கட்டுப்படுத்தும் வேதிப்பொருட்களைப் பற்றி மட்டும் பார்ப்போம்:

1. குயிர்செடின் (Quercetin)
2. டிரைகோனலின் (Trigonelline)
3. டையோஸ்ஜெனின் (Diosgenin)
4. கேலக்டோமனான் (Galactomannan)
5. 4 ஹைட்ராக்சி ஐசோலூசைன் (4 hydroxyisoleucine)

ஒவ்வொன்றின் செயல்பாடுகளை விளக்கமாகப் பார்ப்போம்:

குயிர்செடின் (Quercetin)

இது மருத்துவக் குணம் கொண்ட பிளேவனாய்டு. இது நீரிழிவு நோயைப் பல்வேறு வகைகளில் கட்டுப்படுத்துகிறது.

1. குடலில் சர்க்கரை (குளுகோஸ்) உறிஞ்சப்படும் நிலையில் தடுக்கப்படுவதால், ரத்தத்தில் குளுக்கோஸ் உயர்வதைத் தடுக்கிறது.
2. ரத்தத்தில் குளுக்கோஸ் அளவை கட்டுப்படுத்தும் நாளமில்லா சுரப்பியான இன்சுலினைச் சுரக்கக்கூடிய கணையச் செல்களை ஊக்குவிப்பது மட்டுமில்லாமல் அழியாமலும் பாதுகாக்கிறது.
3. ரத்தத்தில் உள்ள குளுக்கோஸை தசைகள் அதிகம் எடுத்துக்கொள்ளத் துணைபுரிவதால், ரத்தத்தில் சர்க்கரை அளவை குறைக்கிறது.

➢ **இந்தியாவில்...**

ராஜஸ்தான் மாநிலத்தில் வெந்தியம் அதிக அளவு விளைவிக்கப்பட்டாலும், **குஜராத்** மாநில **உஞ்சா** என்ற நகரமே மிகப்பெரிய சந்தை.

➢ **சேமித்து வைக்கக்கூடிய நாட்கள்:**

காற்றுப் புகாத வெப்பம் கட்டுப்படுத்தப்பட்ட நிலையில் இருந்தால் வெந்தயத்தில் உள்ள மருத்துவக் குணமுடைய வேதி பொருட்கள் ஐந்து ஆண்டுகளுக்கு நிலைத்திருக்கும்.

➢ **சாப்பிடுவோர் கவனத்துக்கு:**

வெந்தயம் எடுத்துக்கொண்டவர்களின் சிறுநீர் வழியே வெந்தயத்தில் உள்ள சோலோடோன் (solotone) என்ற புளித்த சாராய மணம் கொண்ட வேதிப்பொருள் வெளியேறும். இது எவ்விதப் பாதிப்பையும் ஏற்படுத்தாது. வெந்தயம் எடுத்துக்கொள்வதை நிறுத்தினால், இதுவும் நின்று விடும்.

➢ **ஆண்மையை மீட்டெடுக்கும்:**

நீரிழிவு நோய்க்கு ஆட்பட்டவர்களுக்கு ஆண்மைக் குறைவு ஏற்படும். வெந்தயத்தில் உள்ள பெனுசைடு (fenuside) என்ற சப்போனின், ரத்தத்தில் ஆண்மைக்கான ஹார்மோனான டெஸ்டோஸ்டீரோன் உயர்வதை ஆய்வு உறுதிசெய்கிறது. இந்த வேதிப்பொருள் மட்டும் தனியாகப் பிரித்தெடுக்கப்பட்டுச் சந்தைப்படுத்தப்படுகிறது.

டிரைகோனலின் (Trigonelline)

இது ஆல்கலாய்டு வகையைச் சேர்ந்த வேதிப்பொருள். வெந்தயத்தைச் சட்டியில் இட்டுப் பொன்வறுவலாக வறுக்கும்போது, அதன் கசப்புத்தன்மை குறையும். இவ்வாறு வறுக்கும்போது டிரைகோனலின் என்ற ஆல்கலாய்டு வேதிமாற்றம் அடைந்து நிக்கோடினிக் அமிலம் என்ற வைட்டமின் பி 3-யாக உருவாகிறது. எனவே, நீரிழிவு நோயாளிகள் வறுத்த வெந்தயத்தை உட்கொண்டால் வைட்டமின் பி-3 குறைவால்

ஏற்படும் நோய்களான வாய்ப்புண், கழிச்சல் போன்றவை தடுக்கப்படும். முளைகட்டிய வெந்தய விதையிலும் வைட்டமின் பி-3 உருவாகிறது என்பதை ஆய்வுகள் உறுதிசெய்துள்ளன.

டைசோஜெனின் (Diosgenin)

வெந்தயத்தில் உள்ள சப்போனின் வகையைச் சேர்ந்த வேதிப்பொருள் இது. நோய் அறிகுறிகளை உடனடியாகக் குறைக்கும் ஸ்டீராய்டுகள் என்ற ஆங்கில மருந்துகளைச் செயற்கையாகத் தயாரிக்க உதவும் மூலப்பொருள் இது. ரத்தத்தில் உள்ள கொழுப்பை இந்த வேதிப்பொருள் மலம் வழியாக வெளியேற்றுவதால், நீரிழிவின் துணைநோயான ரத்தக்கொழுப்பின் அளவை உடலில் குறைத்து, சரியான விகிதத்தை அடைய உதவுகிறது. அத்துடன், ரத்தக் குளுகோஸ் அளவையும் கட்டுப்படுத்துகிறது.

கேலக்டோமனான் (Galactomannan)

வெந்தயத்தில் உள்ள கரையும் தன்மை கொண்ட நார் பொருள் இது. இந்த வேதிப்பொருள்தான் நீரில் வெந்தயத்தை ஊற வைக்கும்போது ஏற்படும் வழுவழுப்பு தன்மைக்குக் காரணம். இது மலச்சிக்கலை நீக்கும், ரத்தத்தில் உள்ள குளுகோஸ் அளவை குறைக்கும், கல்லீரலைப் பாதுகாக்கும் தன்மை கொண்டது.

4 ஹைட்ராக்சி ஐசோலூசைன் (4 hydroxyisoleucine)

வெந்தயத்தில் உள்ள அமினோ அமிலம் இது. ரத்தத்தில் சர்க்கரை அளவு உயர்ந்திருந்தால் மட்டுமே, இன்சுலினைச் சுரக்கத் தூண்டி ரத்தச் சர்க்கரையைச் சரியான அளவுக்குக் கொண்டு வரும் இதன் சிறப்பான செயலால், நீரிழிவு நோய் இல்லாதவர்களுக்கு அளிக்கப்பட வேண்டிய உணவாக நமது அஞ்சறைப் பெட்டியில் இடமளித்த முன்னோர் அறிவு வியக்கும்படி உள்ளது.

நீரிழிவுக்கு மருந்தாக...

நீரிழிவு நோய்க்கு மருந்தாக 10 கிராம் வெந்தயத்தை எடுத்து வெந்நீர் விட்டு 3 மணி நேரம் ஊற வைத்த பின், வடிகட்டி குடிக்கலாம். உணவுக்குப் பின் காலை, மதியம். இரவு என மூன்று வேளையும் இதை எடுத்துக்கொள்ளலாம்.

நோயின் ஒவ்வொரு அறிகுறிகளுக்கும் ஒரு மாத்திரை என உட்கொள்ளும் காலத்தில் வாழ்கிறோம். இந்த நிலையில் நீரிழிவு நோய் காரணமாக உருவாகும் பல்வேறு அறிகுறிகளைக் கட்டுப்படுத்தும், அனைத்து வேதிப்பொருட்களும் வெந்தயத்தில் இடம்பெற்றிருப்பது, நீரிழிவு நோய்க்கு இயற்கை அளித்த கொடை. எனவே, வெந்தயத்தை உரிய அளவில் உணவில் சேர்த்து, நீரிழிவு இல்லாத உலகைப் படைப்போம்.

கட்டுரையாளர்: டாக்டர் ஜெ. ஸ்ரீராம், அரசு சித்த மருத்துவர்,
தொடர்புக்கு: sriramsiddha@gmail.com
Courtesy: தி இந்து, 23.07.2016

தகவல் களஞ்சியம்

ஒரு கிலோ முளைக் கீரையில் 70 கிலோ வாழைப்பழத்தின் வைட்டமின் ஏ உள்ளது.

ஒரு கிலோ அகத்தி கீரையில் 113 கிலோ ஆப்பிளின் கால்சியம் சத்து உள்ளது.

ஒரு கிலோ அரைக்கீரையில் 32 கிலோ அன்னாசியின் இரும்பு சத்து உள்ளது.

ஒரு கிலோ முருங்கை கீரையில் 7 மடங்கு ஆரஞ்சின் விட்டமின் சி மற்றும் 3 மடங்கு வாழைப்பழத்தின் பொட்டாசியம் சத்து மற்றும் 4 மடங்கு பாலில் உள்ள கால்சியம் சத்து மற்றும் 4 மடங்கு கேரட்டின் விட்டமின் ஏ சத்து மற்றும் 2 மடங்கு தயிரின் புரத சத்து உள்ளது.

மனித மூளை மனித நரம்பு மண்டலத்தின் தலைமையானது, மனித உறுப்புகளில் சிக்கலானது ஆகும். மனித மூளை, விழிப்புணர்வு இன்றியும் இயங்கும். இச்சை இன்றிய செயற்பாடுகளான மூச்சு விடுதல், செரிமானம், இதயத்துடிப்பு, கொட்டாவி போன்ற செயற்பாடுகளையும், விழிப்புணர்வுடன் நிகழும் சிந்தனை, புரிதல், ஏரணம் போன்ற சிக்கலான உயர்நிலை செயற்பாடுகளையும் கட்டுப்படுத்துகிறது.

காலையில் உணவு உண்ணாமல் இருப்பதன் மூலம் ரத்தத்தில் குறைவான அளவே சர்க்கரை இருக்கும். இது மூளைக்குத் தேவையான சக்தியையும், தேவையான ஊட்டச் சத்துக்களையும் கொடுக்காமல், மூளை அழிவுக்குக் காரணமாகும்.

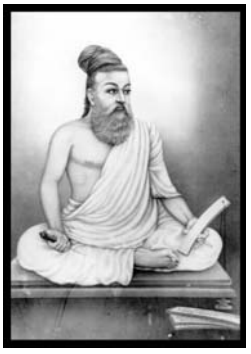
மிக அதிகமாகச் சாப்பிடுவதன் மூலம் இரத்த நாளங்கள் இறுகி மூளையின் சக்தி குறைந்து போகிறது.

புகை பிடித்தால் மூளை சுருக்கமும் அல்ஷைமர்ஸ் (பெருமறதி) வியாதி வருவதற்கு காரணமாகிறது.

நிறைய சர்க்கரை சாப்பிடுவது, புரோட்டின் நமது உடலில் சேர்வதைத் தடுக்கிறது. இதுவும் மூளை வளர்ச்சிக்கு பாதிப்பாகிறது. தேவையான அளவு தூங்காமலிருப்பது மூளைக்கு நீண்டகாலப் பாதிப்பை ஏற்படுத்தும்.

தலையை மூடிக்கொண்டு தூங்குவது, போர்வைக்குள் கரியமிலவாயு அதிகரிக்க வைக்கிறது. இது நீங்கள் சுவாசிக்கும் ஆக்ஸிஜனை குறைக்கிறது. குறைவான ஆக்ஸிஜன் மூளையைப் பாதிக்கிறது. உடல் நோயுற்ற காலத்தில் மிக அதிகமாக மூளைக்கு வேலை கொடுப்பதும், தீவிரமாகப் படிப்பதும் மூளையைப் பாதிக்கும். உடல் சரியாக ஆன பின்னால், மூளைக்கு வேலை கொடுப்பதே சிறந்தது.

TIRUKKURAL AND MANAGEMENT IN A 'NUTSHELL' - 41



A successful and sustaining Business Management must be rooted in 'Fair Trade Practices' and 'Fair Human Resources Practices' and it is advocated by many top Business and Management Consultants that 'Long Standing Brands' are built on this foundation. Tiruvalluvar trumpets these in many of his Kurals and it can be seen in the following examples, the emphasis he gives for the Right way of dealing with people and the Proper approach for earning the Wealth.

"Thaguthi Enaondru Nandre Paguthiyaal Paarpattu Ozhugap Perin" ***Kural 111***

தகுதி எனவொன்று நன்றே பகுதியால்
பாற்பட்டு ஒழுகப் பெறின். குறள் 111

"Equity is supreme virtue
It is to give each man his due."

"Nandre Tharinum Naduvikathaam Aakkaththai Andre Ozhiya Vidal" ***Kural 113***

நன்றே தரினும் நடுவிகந்தாம் ஆக்கத்தை
அன்றே யொழிய விடல். குறள் 113

"Though profitable, turn away
From unjust gains without delay."

"Sorkottam Illathu Seppam; Oruthalaiya Utkottam Inmai Perin" ***Kural 119***

சொற்கோட்டம் இல்லது செப்பம்; ஒருதலையா
உட்கோட்டம் இன்மை பெறின குறள் 119

"Justice is upright, unbending
And free from crooked word-twisting."

HOME FESTIVALS - 11

கார்த்திகை - Karttikai (November/December)

Krittika Dipa (right) is a joyous festival held on the Kritttika nakshatra (when the moon is in Pleiades constellation). Also called Sivalaya Dipa, it is celebrated most famously at Tiruvannamalai (upper left in the painting),on top of Arunachala Hill, home of saint Ramana Maharishi. A bonfire is lit on top that can be seen for miles around. Karthigai Purnima, the full- moon day, honours Lord Murugan. In one traditional story, six sparks from Siva's third eye became six babies (lower left), later gathered into one six-headed Arumugam (center) by Parvati. Celebrations include lighting hundreds of oil lamps especially the standing lamp (right) of the home. On this day in Orissa, devotees make banana leaf boats and float them in the river with oil lamps, especially the standing lamp (right) of the home. On this day in Orissa, devotees make banana leaf boats and float them in the river with oil lamps (lower left).

(To be continued)

"The typical atheist rebels against God as a teenager rebels against his parents. When his own desires or standards are not fulfilled in the way that he sees fit, he, in revolt, storms out of the house in denial of the Word of God and in scrutiny of a great deal of those who stand by the Word of God. The epithet 'Heavenly Father' is a grand reflection, a relation to that of human nature." - CRISS JAMI, Killosophy

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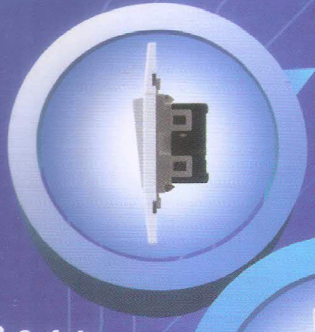

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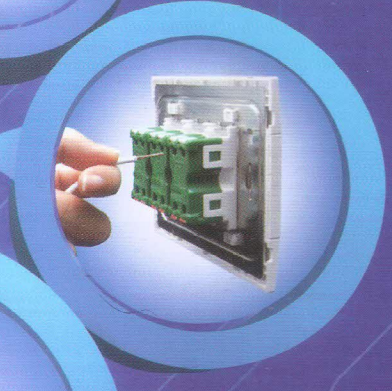

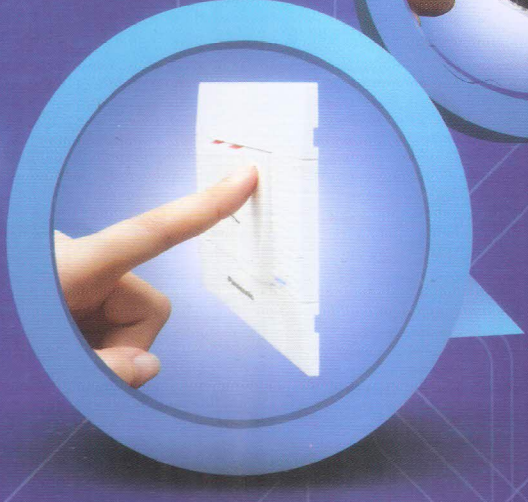

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