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NEWS LETTER

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

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MAY 2018



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EDITORIAL

Dear Members, Fellow Professionals and Friends,

Seasons Greetings To One and All!

The month of May immediately brings to our mind “**May Day**” which is celebrated all over the world as Workers Day. Globally, Industrial Revolution was aggressive from the middle of 19th Century and it really went to its high intensity during the entire 20th Century which is continuing in the 21st Century as well. There are 2 more important days celebrated in May, namely, **National Technology Day on the 11th of May and World Telecommunication Day on the 17th of May.** It will be very interesting to review and appreciate the history and developments combining all the three as the society at large benefitted with improvements of standards of living and spreading of prosperity and comforts. Alongside the Industrial Revolution, the Technology Revolution, addressing the needs of Mechanization and Automation and also the Energy that is needed to support the entire chain of Industrialization were all taking place. In brief, the entire 20th Century saw the (over) exploitation of the Fossils, namely Coal and Petroleum and Technological Developments, both of which, in some cases were threatening the Safety and the fitness of Environment around us. The Telecommunication also went alongside the Industrial and Technological developments contributing to all round developments in all ways. Today, World over, Communication Industry as a huge Service Industry that provides a large scale economic activity and very sizable employment generation.

During the middle of 20th Century, organized and Modern Management practices started addressing the Industries, Businesses and all activities focused to and connecting the society at large and the situation of Capital and Labour transformed into a Management and Knowledge Worker, be it Industrial Manufacturing or Telecommunication or any other Products and Services. In case of India, it is much more interesting to note that we have been able to achieve the growth in about 50/60 years, what it took the rest of the World much more time. The progresses have been remarkable, in spite of Political, Economical and other crisis periodically and we are marching to become one of the ‘**Top three Economies**’ of World soon. We can all feel proud that we belong to a Country with a long history of civilization and Culture and we were in the forefront of World economy till around the middle of 18th Century and we are marching ahead to regain our premier position we commanded in the earlier Centuries, We can feel proud that, In spite of all negative forces, we have kept our Unity and faith in Democracy intact, which is helping us both within and outside of our Country.

Let us celebrate the May Day, National Technology Day and the World Telecommunication Day to commit ourselves to contribute better in all spheres of activities to make a Better India.

We thank all those members who have helped us by participating in the advertisement appearing for the issue April 2018 – Wilson Power and Distribution Technologies Pvt. Ltd., Dehn India Pvt. Ltd., Elecspo – 6th Edition, Pentagon Switchgear Pvt. Ltd., Consult Neowatt Power Solutions Pvt. Ltd., Supreme Power Equipment Pvt. Ltd., Galaxy Earthing Electrodes (P) Ltd., Ashlok Safe Earthing Electrode Ltd., Alfa Switchgear (I) Pvt. Ltd., Universal Earthing Systems Pvt. Ltd., Power Cable Corporation.

EDITOR

Technology is nothing. What's important is that you have a faith in people, that they're basically good and smart, and if you give them tools, they'll do wonderful things with them. - STEVE JOBS

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138.	Essar Electricals	Chennai	044-26823614, 98406 28053	EA 2396
139.	George Associates	Chennai	98400 72836, 94440 72836	EA 1992
140.	J.L. Electricals	Chennai	98408 65021, 98841 36717	ESA 448
141.	K.K. Singh Electricals	Chennai	044-22260939, 98841 56789	EA 1797
142.	Kumaran Industries	Chennai	98400 37776, 99400 01142	ESA 305
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147.	Richards&John Wesley Engrs P. Ltd.	Chennai	73585 93791, 94449 04520	EA 2829
148.	Shakthi Electricals	Chennai	044-22434629, 98410 43567	ESA 439
149.	Sharavathy Electricals	Chennai	9444209144	EA 2345
150.	Shrisakthi Electricals	Chennai	044-28474069, 93835 70257	EA 1896

KNOW THY POWER NETWORK - 128

Let us move further - I. LT Feeder Protection

Presently rewirable fuses are used for the protection of the distribution transformers against the down stream faults. This includes fallen or down LT conductors also. Practically, its current level is very much limited due to varies factors. The low magnitude earth fault current brought by faults is responsible for many accidents because there is no protection exists against it. Among the factors that are taken into considerations during the selection of rewirable fuses are,

- Normal and emergency loads
- Line energization transients and load pick up surges.
- Trade off - between the minimum operating current levels to clear low grade faults and the interruption given to the consumers during normal switching operations.

Significant among the factors that are responsible for the delayed operation / non-operation of the protective devices in the LT networks during high impedance, separated or fallen conductor faults are,

- Feeble fault currents
- Slow speed operation of rewirable fuses owing its high “fusing factor”
- Multiple earthing of the system.

If the LV side of the distribution transformers are controlled by MCCBs (Moulded Case Circuit Breakers) which suitable earth fault detectors or relays, a better protection can be easily established. But it involved higher costs. So affordability is an issue faced. As already outlined, modern techniques as listed below will be of much use in this regard.

- Application of static earth fault relays and harmonic relays
- Micro computer based relays
- Ratio ground relays
- Microprocessor based relays
- Sensitive earth fault detecting devices

It may be seen that there is a wide range of earth fault detective devices which can trip the circuit breakers provided on the LV side of distribution transformers. This ensures that there are possible ways to avert the loss of lives human as well as animals caused by down LT conductors / leaky UG power cables. However it is necessary to establish that the distribution transformers are provided with highly reliable circuit breakers on its LV side. i.e. they are aptly connected to sensitive sensing devices. This step will render the LT feeders concerned ineffective immediately on the occurrence of the faults. Under no circumstances, this protective arrangement should be tramped with. The existing rewirable fuse protections offer very little protection or no protection at all against fallen LT conductors. In addition at times it fails to offer protection to the transformers against over loads also.

II. Suggested Remedial Measures for the Problems faced Now

The problem of fallen over head conductors can be attacked on two fronts i.e. either at the source and or at the receiving end.

1. Minimization of the effects of the causative factors that are responsible for the downed conductors i.e. prevention the snapping of the conductors in the first place.
2. Adopt or place apt protective means to clear the faults quickly when such events take place despite our best efforts. Our aim is to “ward off” or “clear” the problem before it assume a crisis level.

The measures as given below may also be helpful to bring down the happenings of separated conductor faults.

- Replacement of aged AAC and copper conductors with ACSR or Aluminium Alloy conductors.
- In the regions facing high industrial / marine pollution, special efforts may be taken to erect chemically treated Aluminium Alloy Conductors (AAC).
- Periodical replacement of old broken shackles discs and other types of insulators and also the rectification of loose bindings / jumperings.
- Periodical inspection of jumpers, bimetallic clamps and slack side jumpers.
- Periodical check of earthing devices.
- Regular night patrols to locate arcing / hot spots / loose connections.
- Adopting tree clearance works regularly
- Provision of insulated separators between the phase conductors in places which are prone to heavy winds or possibility of contacts by vandals.
- Resagging of the lines with high sagging / leaned poles.
- Provision of guarding / earthing cross arms in HT and LT lines at the road crossing locations.

It is desirable to seed that over voltage and over current tripping features are provided to the Moulded case circuit breaker (MCCBs) when they are applied as protective devices.

Significant problems are faced on the underground LT networks in places like Chennai, Madurai and Coimbatore cities due to “dig-in-faults”. It is a perennial problem caused by the agencies other than electricity supply providers like Telephone and Corporation departments while undertaking their underground works. There should be proper co-ordination amongst all this agencies to avert the problems caused by their unintentional dig-in-faults. It is desirable to have a representative of electricity supply provider to witness the trenching works when other agencies undertake jobs near the UG power cable installations. This step will ensure adequate safeguards against the injuries suffered by the UG HT and LT cables by Third parties.

III. Concluding Remarks

Before concluding, it is once again stressed that the fallen OH line conductor is one of the significant potential sources that always lead to the losses of human and animal lives accompanied with huge financial losses. Important aspects of this perennial problem has been brought into focus; several remedial measure have also been suggested for adoption.

In the next article, the journey to a new site will be undertaken. Till then stay tuned.

(To be continued...)



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INDIA'S FIRST GRID-SCALE ELECTRICITY STORAGE SYSTEM INAUGURATED

AES India, a subsidiary of US-based AES Corporation, and Mitsubishi Corp today started construction on India's first utility-scale energy storage system, a 10 Megawatt (MW) facility that will serve the electric grid operated by Tata Power Delhi Distribution Ltd, the power distribution arm of Tata Power.

The launch of the mega storage facility marks a key step forward in modernizing India's power system and improving grid efficiency. India is executing a plan to set up 175 Gigawatt of renewable energy capacity by 2022 and deploying energy storage systems will help network operators mitigate solar and wind resources' variability and reduce congestion on the transmission system. It will also help deliver affordable power and enable new revenue sources from frequency regulation and other grid services.

AES and Mitsubishi Corp will own the Advancion storage solution being supplied by Fluence — an energy storage technology and services company owned by Siemens and AES — and being deployed at Rohini in Delhi at a substation operated by TPDDL. Once completed later this year, the 10 MW solution will enable better peak load management, add system flexibility, and enhance reliability for more than 7 million customers in the Delhi region.

"The first of its kind system will help to create a business case for the deployment of storage in India, to address challenges in peak load management, system flexibility, frequency regulation and reliability on the network. This project will provide a platform to demonstrate energy storage as a critical distribution asset and help to balance distributed energy resources, including rooftop solar," said Praveer Sinha, Chief Executive and Managing Director at TPDDL.

Commenting on the development, Tsunehiro Makabe, General Manager of Mitsubishi Corp's Environmental Energy Business Department said the company looks forward to demonstrating different applications in which battery-based energy storage can be used.

Energy World



HATSUN AGRO JOINS GLOBAL RENEWABLE ENERGY BANDWAGON "RE 100"

Manufacturer of branded milk and ice-cream, Hatsun Agro Product Ltd today said it has pledged to make its energy sourcing 100 per cent renewable by 2032 by joining a global clean energy initiative "RE 100." Joining "RE 100" which is aimed at harnessing clean power and commitment to 100 per cent renewable energy, HAP said it already sourced about 82 per cent of its power requirements from renewable sources.

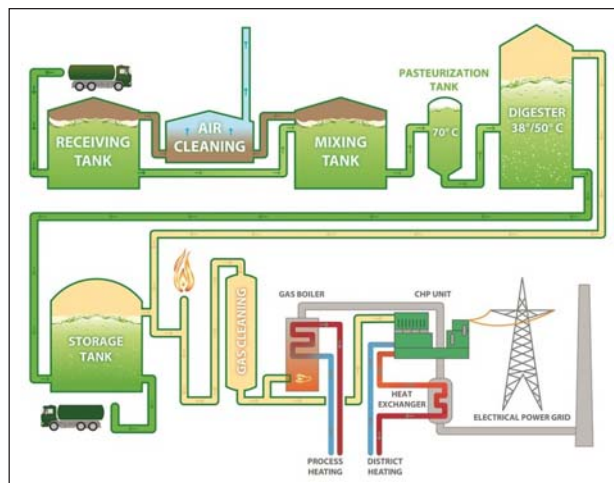
The company with brands "Arokya," "Arun Ice Creams," and "Hatsun" said it has already commissioned wind power plants with 24 MW capacity in Tuticorin district and a 550 KW solar plant in Dindigul District. "HAP has adopted a proactive strategy to utilise renewable energy resources to power its equipment like testing and weighing in over 9,400 of their 9,500 milk collection centres in Tamil Nadu, Karnataka, Maharashtra, Andhra Pradesh and Telangana," a release said.

Chairman and Managing Director, HAP, RG Chandramogan said, **"our mission is to leave the world in a better place... that's why we have joined the global RE 100 campaign.. to source 100 per cent renewable electricity by 2032."** The global initiative is led by the Climate Group, an international non-profit organisation. It is a collaborative effort uniting the world's businesses committed to 100 per cent renewable power.

In 2015, Indian information technology giant, Infosys became the first Indian company to commit itself for 100 per cent renewable power and join the "RE 100".

MNRE TO SET UP 65,180 BIOGAS PLANTS IN CURRENT YEAR UNDER THE NATIONAL BIOGAS AND MANURE MANAGEMENT PROGRAMME (NBMMP)

The National Biogas and Manure Management Programme (NBMMP) aims at setting up of family type biogas plants for providing biogas as clean cooking fuel and a source of lighting. The slurry produced from biogas plants as a by-product is an organic bio-manure for enhancing crop yield and maintaining soil health. The biogas technology dissemination helps in reducing the environment degradation and prevents the emissions of Green House Gases (GHGs) such as Carbon Dioxide (CO₂) and Methane into the atmosphere. The Ministry of New and Renewable Energy (MNRE) has fixed an annual physical target of setting up 65,180 biogas plants for the current year 2017-18 under the NBMMP.



Under the NBMMP, about 49.6 lakh household size biogas plants have been installed since the inception of the National Biogas Programme in the country.

The Ministry of New and Renewable Energy (MNRE), through the State Nodal Agencies/ Departments, spreads awareness about the programme (NBMMP) through advertisements in local Newspapers, display of posters in Panchayats Offices, Schools, KisanSeva Kendra's, distribution of booklets on biogas during gatherings at exhibitions, KisanMelas/Fairs etc.

The MNRE has taken various steps to increase the production of biogas in the country including Tamil Nadu which include introduction of new biogas plant designs under the NBMMP such as floating design Shakti Surabhi Model, Solid-State Deenbandhu design model of biogas plants.

This information was provided by power minister R.K. Singh in written reply to a question in Lok Sabha.

Biogas Process

The biogas process is part of a biological waste treatment method used commonly in waste treatment plants anywhere in the world. The only difference is that instead of releasing the gases produced during the fermentation process, the gases are collected and utilized as a gaseous fuel product.

In the biogas production system, liquid organic wastes, animal manure, and solid organic wastes are led into a digester where an anaerobic process using bacteria ferments the wastes and produces biogas as a gaseous bi-product. The remaining non-digestible solids in the digester are collected as sludge that can later be returned back to the ground. After the digestion process, the liquid in the waste treatment plant will be rendered sufficiently harmless to the environment and can then be discharged into the rivers.

The biogas produced in a typical plant contains about:

- 60%~70% methane
- 30%~40% carbon dioxide
- Trace amounts of hydrogen sulphide

This biogas produced is further processed so that the carbon dioxide and hydrogen sulphide gases are removed. The result is a gas consisting of mostly methane. This is very similar to natural gas obtained from the oil & gas fields.

By using compressors in a bottling plant, the methane and carbon dioxide gases can be stored under high pressures in cylinders. These gases can be utilized in other industrial applications. Much of the biogas can be used for fuel in vehicles, electrical power generators and for other heating purposes.

With a purposely built or converted gas engine, electrical power generation is viable. When compressed, the methane can be carried along as fuel for CNG vehicles. It can also be cooled to liquid and be carried along to power LNG vehicles. The natural gas can also be combined with diesel oil and used to run special bi-fuel engines.

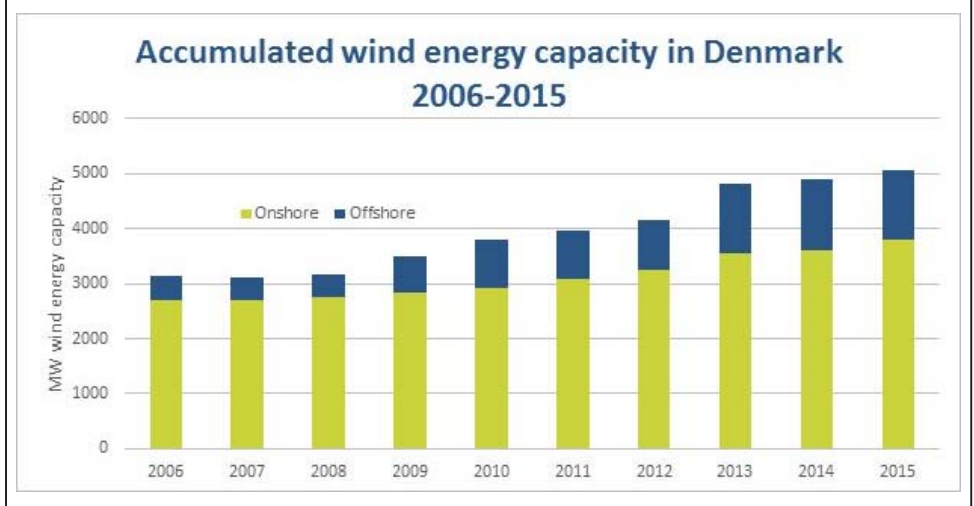
DENMARK UPGRADES WIND TURBINE CAPACITY, REDUCES NUMBER



An overwhelming statistical fact throws light on the evolution of wind turbines, according to the Danish Energy Agency Energistyrelsen (and its associated 4 decades of statistical data), in charge of following up on the development of the energy and supply sectors in the country, and its survey of turbine inventory.

Denmark was a pioneer in developing commercial wind power during the 1970s, and

today a substantial share of the wind turbines around the world are produced by Danish manufacturers such as Vestas and Siemens Wind Power along with many component suppliers. So, it is not by chance that old-tech turbines have shown such reliability through almost 4 decades, with the oldest 48 still going strong from the late 1970s despite having a combined capacity of only 2 megawatts. Compare that to the standard Vestas V164 turbine introduced in 2013 with a capacity of 7 — 9 megawatts (MW). That's a 200-fold improvement! With the advent of the updated turbines, the older ones are meant to be decommissioned in larger numbers should the tendency continue. In 2017, a total of 220 turbines were connected to the grid with a combined capacity of 373 MW, while a total 174 turbines with a total capacity of 98 MW were deactivated. It means with the added 46 turbines an overall 275 MW was produced. That's an average of 6 MW per turbine accomplished nowadays versus the 1970s' pioneers 25 kW.



By the end of 2017, Denmark had a total of 6,157 turbines operational with a total capacity of 5.5 GW generating a total of 14,772 GWh of electricity. With no further technological update, and maintaining the average of 6 MW per turbine, it would mean that a total of 917 turbines would suffice to preserve 5.5 GW of capacity. It is assumed that 10 GW of total capacity will be the goal in the country, which means some 2,000 turbines is enough, or one-third of today's number.

According to chief consultant Kristine Grunnet from Danish Energy, as per an article in DR News on behalf of the energy companies in Denmark, more than half of the wind capacity on land will be decommissioned by 2030. She states:

“While many want to have the turbines placed far out to sea, it is still important to have turbines on land. We need a lot of renewable energy, and wind turbines [on land] are simply the cheapest right now, supplying the cleanest energy for our money. We actually believe that we can restore the beauty of the Danish landscape by replacing a lot of turbines with fewer, slightly bigger, but also more efficient ones. When we set up one new turbine, it can replace up to six of the old ones.”

With fewer and more efficient turbines, wind power units can be placed at chosen locations where nature blows steadily and strong, away from residential areas, thus avoiding long-standing claims about turbines changing the surrounding natural landscape and introducing low-frequency noise. Since 1977, 9,387 turbines have been installed in Denmark and 3,230 decommissioned. Of the 6,157 turbines left 23.6% are on land (5,649), and 8.6% at sea (508).

For Denmark wind power at sea started back in 1991, with just 11 turbines each of 500 KW capacity, delivering 26 years of work before being dismantled just last year. Most importantly is the fact that the first turbines manufactured for operation at sea were twenty times more robust than the first turbines built for use on land in 1977.

The evolution of wind power in the last few decades has been impressive; however, a factor that will shape the energy market in Denmark and most everywhere else is the potential for cheaper solar power. Notwithstanding, wind power continues to be the energy choice for countries with high winds, such as Denmark. How well other alternative energies will ensure a smooth transition from fossil-fueled economies to green energies remains to be seen.

[Via Clean Technica]

TECH STARTUPS, TAKE NOTE: MORE INDIANS ACCESS THE INTERNET IN THEIR NATIVE LANGUAGE THAN IN ENGLISH

While proficiency in the English language has a certain aspirational quotient in India, a new wave of internet users in the country are opting to access the internet in their native language. While English is the most common language on the internet, only about 12% of India's population is familiar with English.

According to a report by Google and KPMG India published in April 2017, there were 234 million Indian-language internet users in 2016 while only 175 million English users, and the gap between the two groups is expected to widen going forward. The report states that nine out of ten new internet users between 2016 and 2021 will use local languages.

Last few years have seen a rapid scale of adoption of the Internet across the country piggy backing on affordable smartphones and cheaper mobile data plans. Yet, India's population still struggles with a deep digital language divide.

The English upstart

When computers became mainstream in the late 1990s and early 2000s, Windows did not offer any of the top Indian languages as an out-of-the-box system language. Most Indian language users, especially those who didn't study the English language at school, struggled with PCs in their colleges and at work but had no way out.

Putting a PC on every desk, Microsoft's vision at the time, wouldn't have been possible while alienating a large size of the population. Microsoft, with its Project Bhasha initiative, started focusing on Indic language computing and with progressive steps in the direction through the years. Now, Windows 10 supports over a dozen Indian languages out of the box.

This was mirrored in the mobile ecosystem. In early days, limited language support and content was the biggest barrier for internet adoption for a majority of Indian language mobile-first internet users. Most of them also struggled with the English keyboard options.

The Indian language ecosystem

By 2021, there will be over 500 million users of Indian languages while English users will be less than half the number. Hindi-speaking users alone will overtake English-speaking users and Hindi will be the most used language on the Internet in India while Marathi, Bengali, Tamil and Telugu speaking internet users will form 30% of the total Indian language internet user base.

Indus OS Labs, a homegrown startup was quick to identify this opportunity, and its Indus OS, based on Android, is a multilingual operating system that supports 12 regional Indian languages. The OS does not just offer the interface in regional languages but also provides built-in features like translation, transliteration, as well as text-to-speech. Several domestic players like Micromax, Intex and Karbonn have a portfolio of budget smartphones powered by Indus OS.

For a mobile-first country, the trend implies that app developers cannot get away without localizing English language apps. India had nearly 300 million smartphone users in 2017, and hence local language support on mobile devices can make or break the adoption or scale of a product.

Facebook, one of the most popular apps in the country supports 13 local languages, for example. Google too has also been ramping up its apps and services — some of the ubiquitous ones on Android smartphones — to support regional Indian languages. Two years ago, Microsoft acquired Swiftkey, the iOS and Android keyboard app that offers predictive texting in 24 Indian languages.

Indian startups too are on an overdrive to target this once niche market segment that has now gone mainstream. There are localized apps and services built from the ground rather than adding language support as an afterthought. ShareChat, a popular app that allows you to share diverse content — from memes to news to cooking recipes — in 10 languages and 27 dialects, garners over 3.5 million daily active users. DailyHunt, the leading news aggregator with over 150 million app installs, offers content in 14 local languages.

One of the unresolved challenges though is the e-commerce ecosystem and the payments interface which are still not Indian-language-friendly, preventing the masses to transact online.

The next big thing

Instead of localizing individual products and services, Microsoft is working on advancements in language computing leveraging cloud, machine learning and artificial intelligence that would benefit its own portfolio of products and services while taking the industry forward.

In 2016, after a more than 20-year push, Microsoft made a major breakthrough in speech recognition, creating a technology that recognizes the words in a conversation as well as a person does. The human parity in conversational speech recognition will have broad implications for consumer and business products and digital assistants like Cortana that can be significantly augmented by speech recognition.

Microsoft is also leveraging the power of artificial intelligence and deep neural networks to improve real-time language translation from English to Hindi, Bengali and Tamil and vice versa. One of the showcases of these developments is Dictate, which converts speech to text using the speech recognition behind Cortana and Microsoft Translator, the company's multilingual machine translation cloud service.

Linguistic diversity

Not just in India, but globally too, the dominance of English language online is fading. In the mid-1990s, four-fifths of online content was in English and it has since fallen to just half of the total. So, the indulgence in localization and language computing makes business sense for technology companies, platform makers and OEMs, as well as online publishers.

A linguistic democratization would help more and more Indians experience the power of computing and the internet. As infrastructural and ecosystem challenges are met, India's growing digital literacy also needs to be supported by a multi-lingual digital world.

Life isn't about finding yourself. Life is about creating yourself - GEORGE BERNARD SHAW

ABB'S INNOVATIVE FLASH-CHARGING TECHNOLOGY USHERS IN A NEW ERA OF SUSTAINABLE PUBLIC TRANSPORTATION



This isn't a conventional electric bus. The Davos bus is powered by an innovative battery-charging network ideally suited to public transportation in a municipal setting. This technology is already in use in Geneva, where the system is known as TOSA, and is being installed in Nantes, France.

TOSA, one offering within ABB's extensive portfolio of charging and drivetrain solutions for electric buses, uses a flash-charging system that enables the e-bus to run quietly, with a maximum passenger capacity. The flash-charging station recharges the compact battery in 20 seconds or less, as passengers alight and others board.

While much of the Davos forum involves peering into the future, the buses demonstrate a sustainable mobility technology that is available today. One ABB-powered bus will drive a circuit of 3 kilometers (1.8 miles), making seven stops on a route running through the city.

The Davos bus is emblematic of Zurich-based ABB's deep involvement and commitment to its Swiss homeland and heritage. For more than a century, ABB has been helping make Switzerland a world leader in transportation, industrial and power-management technologies. The ABB Corporate Research Center in Baden-Dättwil collaborates with leading research universities around the world, including the Federal Institutes of Technology in Zurich and Lausanne. TOSA, which was developed in Switzerland and has won international awards for innovation, is part ABB's proud tradition as a technology leader.

A boost of power, then on its way

A TOSA bus looks in many ways similar to the various types of articulated buses used around the world. People may notice only that the electric TOSA bus is nearly silent, compared with the diesel buses prevalent in many urban areas. And of course the e-buses do not spew exhaust clouds when pulling away from the bus stop and accelerating into traffic.

The big difference, though, occurs when the TOSA bus reaches a stop equipped with a flash charging system. As soon as the bus arrives, a laser-controlled arm on the roof connects in less than a second to an overhead receptacle built into the bus shelter. The connection provides a high-power charge – using a feed of up to 600 kilowatts. The boost recharges the battery enough to let the bus continue on its way.



Bus stops with charging stations are equipped with a converter, fed by alternating current (AC) from the utility grid and delivering direct current (DC) to the e-bus. To ensure public safety, the high-voltage overhead connectors are energized only when the battery is being recharged.

TOSA buses can use much smaller, lighter-weight batteries as a result of the flash charges along the route. There is an added boost when braking energy is recaptured and stored in the batteries. With TOSA, even the full charges at an end-of-line station require only a few minutes.

Additional efficiencies are achieved through ABB's self-learning control system and on-board technology, which manage the battery charging and energy storage.

But energy efficiency is only part of the picture. A TOSA bus line is also more economical and flexible for cities to deploy than, say, an electric trolley system or a small tramway. That's because no web of overhead power lines needs to be installed, and no tracks embedded in the street. Those advantages allow more flexibility in routing. And they make it possible to execute impromptu detours when road repairs or a traffic accident blocks the regular route.

Tackling climate and terrain

The Davos installation is a pilot program for the duration of the World Economic Forum. But afterward, the City of Davos plans to take up formal discussions to explore installing permanent electric bus routes and expanding the TOSA charging network. With clean hydropower already supplying most of the electricity for Davos, a switch to a TOSA e-bus fleet would represent a further step toward sustainable mobility.

The project represents the first electric bus line in Davos and the first TOSA bus installation in an alpine city – Davos's elevation is 1,550 meters (5,100 feet) – and provides an ideal demonstration of the technology's reliability in harsh weather conditions and hilly terrain.

A broader European push

ABB is supporting the European Commission's European Clean Bus Deployment Initiative. The program, the first of its kind, will encourage collaboration among infrastructure providers, transport operators and bus manufacturers to incorporate more alternative-energy buses into Europe's public transportation systems. Organizers hope to improve the share of alternatively fueled buses in Europe to 30 percent by 2025, up from only about 12 percent today.

ASHOK LEYLAND BETS ON ISRAEL-BASED COMPANY'S ALUMINUM AIR BATTERY FOR ELECTRIC COMMERCIAL VEHICLES

Ashok Leyland, the auto arm of the Hinduja Group said it signed a Letter of Intent (LoI) with Phinergy, an Israel-based company that is developing Aluminium Air batteries for long-range vehicles. Unlike lithium ion batteries, which need to be recharged after 200-500 km, a vehicle that uses aluminum air battery can run for several thousand kilometers.

Another advantage is that the energy-to-weight ratio of aluminum air batteries is far higher than that of lithium ion batteries. A lithium ion battery that is designed to last for the entire duration of a cross-country truck route will weigh as much as the truck itself, but not an aluminum air battery.

Phinergy claims an energy to weight ratio of 8 kWh (8,000 watt hours) of stored electricity per kg of aluminium. A typical lithium ion battery stores only 150 watt hours per kg. A truck would consume at least 25,000 watts on average, and to run it for one hour would require a 25,000 watt-hour battery.

Such a battery would weigh 167 kg in lithium ion technology. Using aluminum air, the battery would contain only 3 kg of the metal. To run the truck for 10 hours non-stop would require a battery that is 10 times as heavy. The higher storage to weight ratio could make the solution 'grid independent' as the vehicle can run for up to a day on a single battery. Moreover, aluminum air batteries are less expensive than lithium ion batteries, especially in high capacity versions.

The downside of these batteries is that they cannot be recharged at home. To 'recharge' them, their anode has to be mechanically replaced with new ones.

This makes aluminum air batteries useful for fleet operators whose trucks run non-stop for thousands of km from point to point. In such situations, the batteries need to be replaced only once in 1,000-1,500 km or so. Ashok Leyland, being one of India's top truck makers, is hoping to include the technology in its solutions.

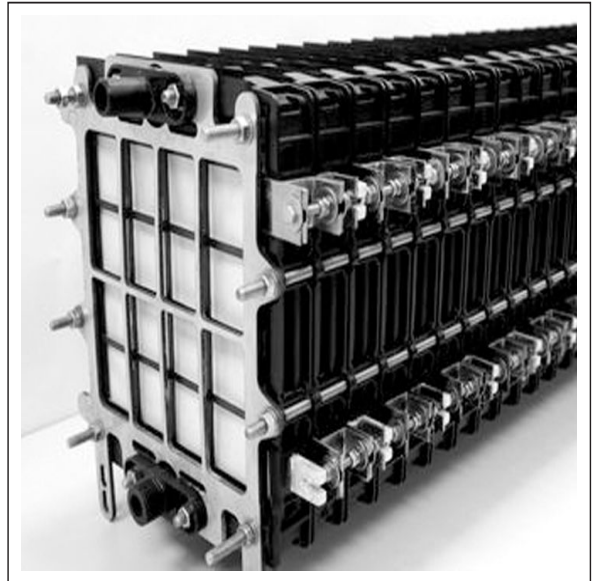
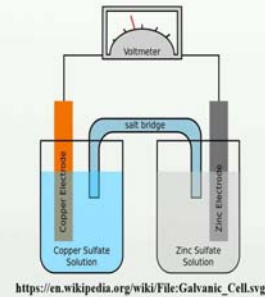
"Over the next few months, we will develop the first few prototypes and trial pilots on different platforms in order to better tune Phinergy's offering for various commercial vehicle applications," said S.A. Sundaresan, Head of eMobility Tech, Ashok Leyland.

"Our approach to EV Commercial Vehicles will continue to be such that we move people and goods rather than batteries, with optimal use of battery capacities", added Mr. Karthick Athmanathan, Head-EV and eMobility Solutions for the Indian company said he saw good potential for Phinergy's technology in India.

"This will add further to our various portfolios for Commercial Vehicle EVs, where We are committed to offering our customers competitive solutions with various options that use cutting edge technology." Aviv Tzidon, CEO of Phinergy said his company has been working with Ashok Leyland for over a year.

"We believe that our high technology solution will help the Indian customer to keep costs low while addressing range anxiety and reliability. We look forward to rapidly developing our offering and Scaling up operations for CV applications in India," he said. "Given the Grid and Power position in most markets, this will be the first time EV Commercial Vehicles will have a Grid-independent solution that is cost-effective as well as emission-free", added David Mayer, WP of Business Development for Phinergy.

Aluminium-air battery



Ultra News

WHY POLYMER SOLAR CELLS DESERVE THEIR PLACE IN THE SUN

Polymer solar cells may lag behind traditional silicon solar cells in longevity and efficiency, but could ultimately power autonomous remote sensors and wearable technology.

WASHINGTON, D.C., February 20, 2018 — Unlike traditional silicon solar cells, organic polymer solar cells (PSCs) may never cover the hillsides of a megawatt solar farm. But, these lightweight, flexible cells show potential to provide solar power to remote microwatt sensors, wearable technology and the Wi-Fi-connected appliances constituting the “internet of things.”

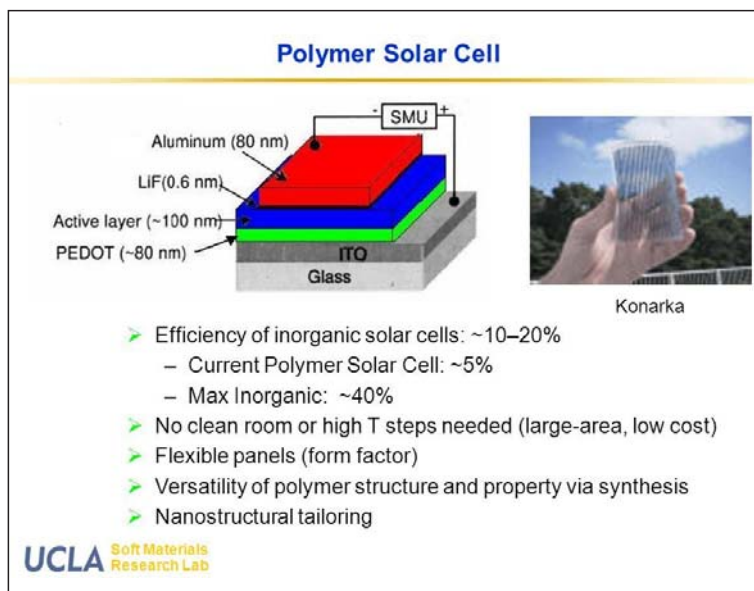
PSCs use organic polymers to absorb light and convert it to electricity. While PSCs cannot match the durability or efficiency of inorganic solar cells, the potential to mass-produce nontoxic, disposable solar panels using roll-to-roll production makes them attractive for additional applications. In a paper published this week in the *Journal of Renewable and Sustainable Energy*, from AIP Publishing, Paul Berger and Minjae Kim of Ohio State University review the latest advances and remaining challenges in PSC technology.

Research into PSCs has grown rapidly over the last two decades, generating increasing numbers of publications and patents. This emerging technology, however, is unlikely to replace traditional inorganic solar cells. Instead, Berger sees PSCs as complementary. They can bypass the high-voltage transmission lines and provide electricity to point-of-use devices that would otherwise require toxic batteries.

For example, **PSCs could power freshness sensors on food packaging simply using the overhead lights in grocery stores. Furthermore, they could go beyond store inventory control, and tie into a “smart kitchen” to reduce food waste and automate grocery lists. “PSCs have this ability to be flexible, because they basically are plastics, so you can put them on backpacks, jackets and even coffee creamer — a whole range of things where it’s at the point of use,” said Berger. “It’s a disruptive business model.”**

The polymers can be dissolved in solvents and printed onto a flexible backing using affordable roll-to-roll production, making this technology especially attractive. “This printing press is not unlike the one for printing your Sunday newspaper, but instead of three primary colors and black, you’re printing the four or five different layers needed for the solar cell, diodes and transistors,” Berger said. Long rolls of solar cells also open up new applications, such as wrapping vehicles or covering building facades and windows. Berger cautions, however, that certain expensive PSC raw materials, namely indium tin oxide and fullerenes, which have proved challenging to replace, may limit near term affordability.

Longevity is another issue because the polymers and reactive metal cathodes oxidize when exposed to water and oxygen. “They tend to degrade fairly quickly,” Berger said, making it necessary to encapsulate the solar



cells for protection. This encapsulation can be very effective on glass, but is more challenging on flexible surfaces, like potato chip bags.

In the lab, PSC efficiency reaches about 13 percent, which is far from the 20 percent efficiency of commercial solar panels. PSCs that use P3HT: PCBM polymers, introduced in 2002, are the standard “workhorse” design and yield about 3.5 percent efficiency. Recent advances in chemistry, geometry, and the development of tandem solar cells that stack multiple layers together have made this greater efficiency possible.

A handful of companies in the U.S. and Europe are working to bring viable PSCs to market. If successful, then PSCs could establish their own niche apart from silicon solar cells, powering all manner of remote devices.

SUZLON DESIGNS AND PRODUCES INDIA'S LONGEST WIND TURBINE BLADE OF 63 METERS

- **Longest wind turbine blade ever manufactured in India**
- **Rotor blade for the new S128 series of wind turbines**
- **Rotor blade incorporates advance aerodynamics and carbon fiber technology**

India: Suzlon Group, India's largest renewable energy solutions provider has designed and manufactured the country's longest wind turbine blade at its Padubidri Rotor Blade Unit. The advanced blade (SB 63) measures 63 meters in length and has been specifically developed for Suzlon's new S128 wind turbine family with a rotor diameter of 128 meters, 1.5 times taller than the India Gate monument in terms of height. Suzlon's turbines have been setting industry benchmarks across the technology value chain by bringing global scale capability to India.



This blade has been engineered with a carbon girder which provides the capability to utilize thinner aerodynamic profiles and provides higher lift with less drag to contribute to the turbine's excellent performance in low wind sites. The blade also incorporates flat back technology at the root that minimizes drag and saves additional weight and cost. The S128 series offers ~33% more swept area (12,860 m²) and is expected to deliver ~32% more energy generation compared to the S111. With an increase in the swept area Suzlon's next generation turbine is well equipped to improve energy yield and support competitive tariff environment in India while protecting our customers return on investment.

These rotor blades will be transported using an innovative two fold transport system, which will use a specialized 'Adapter Trailer' for the first time in India, which ensures safe and unbound maneuverability through the hilly terrain, while transporting the long blades. This innovative approach will ensure a safe, cost effective and time efficient mode of transport for the 63 meters long rotor blade to the most remote areas.

About Suzlon Group:

Renewable energy solutions provider in the world with an international presence across 18 countries in Asia, Australia, Europe, Africa and Americas. Headquartered at Suzlon One Earth in Pune, India; the group is comprised of Suzlon Energy Limited (NSE & BSE: SUZLON) and its subsidiaries. A vertically integrated organization, with over two decades of operational track record, the group has a cumulative installation of over 17 GW of wind energy capacity, over 7,600 employees with diverse nationalities and world-class manufacturing facilities. Suzlon is the only Indian wind energy company with a large in-house Research and Development (R&D) set-up in Germany, the Netherlands, Denmark and India. Over 11 GW of the group's installation is in India, which makes up for ~35% of the country's wind installations, making Suzlon the largest player in this sector. The group is the custodian of over 15 GW of wind assets under service globally. The company has also forayed into the solar space.

USING A LASER TO WIRELESSLY CHARGE A SMARTPHONE SAFELY ACROSS A ROOM

Although mobile devices such as tablets and smartphones let us communicate, work and access information wirelessly, their batteries must still be charged by plugging them in to an outlet. But engineers at the University of Washington have for the first time developed a method to safely charge a smartphone wirelessly using a laser.

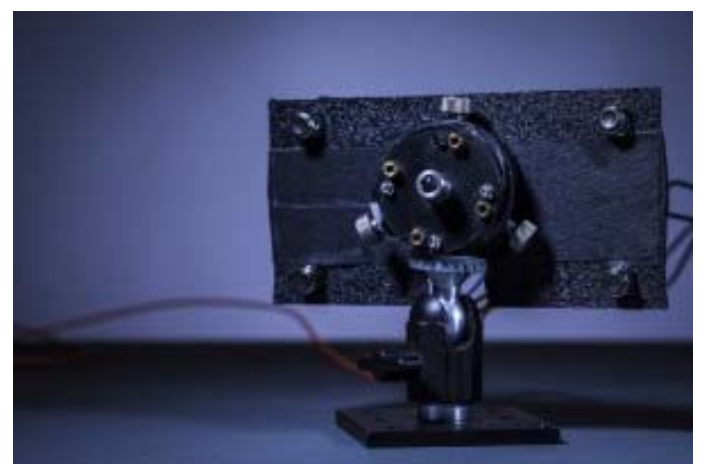
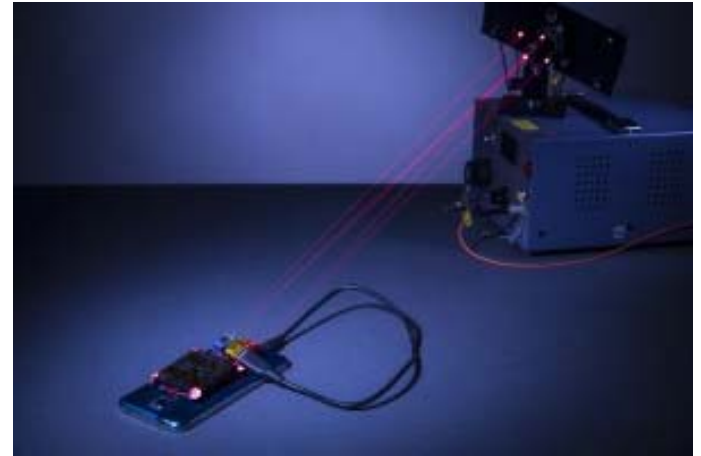
As the team reports in a paper published online in December in the Proceedings of the Association for Computing Machinery on Interactive, Mobile, Wearable & Ubiquitous Technologies, a narrow, invisible beam from a laser emitter can deliver charge to a smartphone sitting across a room - and can potentially charge a smartphone as quickly as a standard USB cable. To accomplish this, the team mounted a thin power cell to the back of a smartphone, which charges the smartphone using power from the laser. In addition, the team custom-designed safety features - including a metal, flat-plate heatsink on the smartphone to dissipate excess heat from the laser, as well as a reflector-based mechanism to shut off the laser if a person tries to move in the charging beam's path.

“Safety was our focus in designing this system,” said co-author ShyamGollakota, an associate professor in the UW’s Paul G. Allen School of Computer Science & Engineering. “We have designed, constructed and tested this laser-based charging system with a rapid-response safety mechanism, which ensures that the laser emitter will terminate the charging beam before a person comes into the path of the laser.

“Gollakota and co-author ArkaMajumdar, a UW assistant professor of physics and electrical engineering, led the team that designed this wireless charging system and its safety features.

“In addition to the safety mechanism that quickly terminates the charging beam, our platform includes a heatsink to dissipate excess heat generated by the charging beam,” said Majumdar. “These features give our wireless charging system the robust safety standards needed to apply it to a variety of commercial and home settings.”

The charging beam is generated by a laser emitter that the team configured to produce a focused beam in the near-infrared spectrum. The safety system that shuts off the charging beam centers on low-power, harmless laser “guard beams,” which are emitted by another laser source co-located with the charging laser-beam and



physically “surround” the charging beam. Custom 3-D printed “retroreflectors” placed around the power cell on the smartphone reflect the guard beams back to photodiodes on the laser emitter. The guard beams deliver no charge to the phone themselves, but their reflection from the smartphone back to the emitter allows them to serve as a “sensor” for when a person will move in the path of the guard beam. The researchers designed the laser emitter to terminate the charging beam when any object - such as part of a person’s body - comes into contact with one of the guard beams. The blocking of the guard beams can be sensed quickly enough to detect the fastest motions of the human body, based on decades of physiological studies.



“The guard beams are able to act faster than our quickest motions because those beams are reflected back to the emitter at the speed of light,” said Gollakota. “As a result, when the guard beam is interrupted by the movement of a person, the emitter detects this within a fraction of a second and deploys a shutter to block the charging beam before the person can come in contact with it.”

The next generation of nano-scale optical devices are expected to operate with Gigahertz frequency, which could reduce the shutter’s response time to nanoseconds, added Majumdar.

The beam charges the smartphone via a power cell mounted on the back of the phone. A narrow beam can deliver a steady 2W of power to 15 square-inch area from a distance of up to 4.3 meters, or about 14 feet. But the emitter can be modified to expand the charging beam’s radius to an area of up to 100 square centimeters from a distance of 12 meters, or nearly 40 feet. This extension means that the emitter could be aimed at a wider charging surface, such as a counter or tabletop, and charge a smartphone placed anywhere on that surface.

The researchers programmed the smartphone to signal its location by emitting high-frequency acoustic “chirps.” These are inaudible to our ears, but sensitive enough for small microphones on the laser emitter to pick up.

“This acoustic localization system ensures that the emitter can detect when a user has set the smartphone on the charging surface, which can be an ordinary location like a table across the room,” said co-lead author VikramIyer, a UW doctoral student in electrical engineering.

When the emitter detects the smartphone on the desired charging surface, it switches on the laser to begin charging the battery.

“The beam delivers charge as quickly as plugging in your smartphone to a USB port,” said co-lead author ElyasBayati, a UW doctoral student in electrical engineering. “But instead of plugging your phone in, you simply place it on a table.

“To ensure that the charging beam does not overheat the smartphone, the team also placed thin aluminum strips on the back of the smartphone around the power cell. These strips act as a heatsink, dissipating excess heat from the charging beam and allowing the laser to charge the smartphone for hours. They even harvested a small amount of this heat to help charge the smartphone - by mounting a nearly-flat thermoelectric generator above the heatsink strips.

The researchers believe that their robust safety and heat-dissipation features could enable wireless, laser-based charging of other devices, such as cameras, tablets and even desktop computers. If so, the pre-bedtime task of plugging in your smartphone, tablet or laptop may someday be replaced with a simpler ritual: placing it on a table.

Link : <http://www.washington.edu/news/2018/02/20/using-a-laser-to-wirelessly-charge-a-smartphone-safely-across-a-room/>

New technology is not good or evil in and of itself. It’s all about how people choose to use it.

- DAVID WONG

SYSTEM DRAWS POWER FROM DAILY TEMPERATURE SWINGS

Technology developed at MIT can harness temperature fluctuations of many kinds to produce electricity

Thermoelectric devices, which can generate power when one side of the device is a different temperature from the other, have been the subject of much research in recent years. Now, a team at MIT has come up with a novel way to convert temperature fluctuations into electrical power. Instead of requiring two different temperature inputs at the same time, the new system takes advantage of the swings in ambient temperature that occur during the day night cycle. The new system, called a thermal resonator, could enable continuous, years-long operation of remote sensing systems, for example, without requiring other power sources or batteries, the researchers say.



The findings are being reported in the journal *Nature Communications*, in a paper by graduate student Anton Cottrill, Carbon P. Dubbs Professor of Chemical Engineering Michael Strano, and seven others in MIT's Department of Chemical Engineering. "We basically invented this concept out of whole cloth," Strano says. "We've built the first thermal resonator. It's something that can sit on a desk and generate energy out of what seems like nothing. We are surrounded by temperature fluctuations of all different frequencies all of the time. These are an untapped source of energy."

While the power levels generated by the new system so far are modest, the advantage of the thermal resonator is that it does not need direct sunlight; it generates energy from ambient temperature changes, even in the shade. That means it is unaffected by short-term changes in cloud cover, wind conditions, or other environmental conditions, and can be located anywhere that's convenient — even underneath a solar panel, in perpetual shadow, where it could even allow the solar panel to be more efficient by drawing away waste heat, the researchers say. The thermal resonator was shown to outperform an identically sized, commercial pyroelectric material — an established method for converting temperature fluctuations to electricity — by factor of more than three in terms of power per area, according to Cottrill.

The researchers realized that to produce power from temperature cycles, they needed a material that is optimized for a little-recognized characteristic called thermal effusivity — a property that describes how readily the material can draw heat from its surroundings or release it. Thermal effusivity combines the properties of thermal conduction (how rapidly heat can propagate through a material) and thermal capacity (how much heat can be stored in a given volume of material). In most materials, if one of these properties is high, the other tends to be low. Ceramics, for example, have high thermal capacity but low conduction. To get around this, the team created a carefully tailored combination of materials. The basic structure is a metal foam, made of copper or nickel, which is then coated with a layer of graphene to provide even greater thermal conductivity. Then, the foam is infused with a kind of wax called octadecane, a phase-change material, which changes between solid and liquid within a particular range of temperatures chosen for a given application.

A sample of the material made to test the concept showed that, simply in response to a 10-degree-Celsius temperature difference between night and day, the tiny sample of material produced 350 millivolts of potential and 1.3 milliwatts of power — enough to power simple, small environmental sensors or communications systems.

"The phase-change material stores the heat," says Cottrill, the study's lead author, "and the graphene gives you very fast conduction" when it comes time to use that heat to produce an electric current.

Essentially, Strano explains, one side of the device captures heat, which then slowly radiates through to the other side. One side always lags behind the other as the system tries to reach equilibrium. This perpetual difference between the two sides can then be harvested through conventional thermoelectrics. The combination

of the three materials — metal foam, graphene, and octadecane — makes it “the highest thermal effusivity material in the literature to date,” Strano says.

While the initial testing was done using the 24-hour daily cycle of ambient air temperature, tuning the properties of the material could make it possible to harvest other kinds of temperature cycles, such as the heat from the on-and-off cycling of motors in a refrigerator, or of machinery in industrial plants.

“We’re surrounded by temperature variations and fluctuations, but they haven’t been well-characterized in the environment,” Strano says. This is partly because there was no known way to harness them. Other approaches have been used to try to draw power from thermal cycles, with pyroelectric devices, for example, but the new system is the first that can be tuned to respond to specific periods of temperature variations, such as the diurnal cycle, the researchers say.

These temperature variations are “untapped energy,” says Cottrill, and could be a complementary energy source in a hybrid system that, by combining multiple pathways for producing power, could keep working even if individual components failed. The research was partly funded by a grant from Saudi Arabia’s King Abdullah University of Science and Technology (KAUST), which hopes to use the system as a way of powering networks of sensors that monitor conditions at oil and gas drilling fields, for example.

“They want orthogonal energy sources,” Cottrill says — that is, ones that are entirely independent of each other, such as fossil fuel generators, solar panels, and this new thermal-cycle power device. Thus, “if one part fails,” for example if solar panels are left in darkness by a sandstorm, “you’ll have this additional mechanism to give power, even if it’s just enough to send out an emergency message.”

Such systems could also provide low-power but long-lasting energy sources for landers or rovers exploring remote locations, including other moons and planets, says Volodymyr Koman, an MIT postdoc and co-author of the new study. For such uses, much of the system could be made from local materials rather than having to be premade, he says.

Courtesy: Eurek alert

RESEARCHERS INVENT LIGHT-EMITTING NANO ANTENNAS

Nanoscale light sources and nanoantennas already found a wide range of applications in several areas, such as ultra compact pixels, optical detection or telecommunications. However, the fabrication of nanostructure-based devices is rather complicated since the materials typically used have a limited luminescence efficiency. What is more, single quantum dots or molecules usually emit light non-directionally and weakly. An even more challenging task is placing a nanoscale light source precisely near a nanoantenna.

A research group from ITMO University managed to combine a nanoantenna and a light source in a single nanoparticle. It can generate, enhance and route emission via excited resonant modes coupled with excitons. “We used hybrid perovskite as a material for such nanoantennas,” says Ekaterina Tiguntseva, first author of the publication. “Unique features of perovskite enabled us to make nanoantennas from this material. We basically synthesized perovskite films, and then transferred material particles from the film surface to another substrate by means of pulsed laser ablation technique. Compared to alternatives, our method is relatively simple and cost-effective.”

While studying the obtained perovskite nanoparticles, the scientists discovered that their emission can be enhanced if its spectra match with the Mie-resonant mode. “Currently, scientists are particularly interested in Mie-resonances related to dielectric and semiconductor nanoparticles,” explains George Zograf, Engineer at the Laboratory of Hybrid Nanophotonics and Optoelectronics at ITMO University. “Perovskites used in our work are semiconductors with luminescence efficiency much higher than that of many other materials. Our study shows that combination of excitons with Mie resonance in perovskite nanoparticles makes them efficient light sources at room temperature.”

In addition, the radiation spectrum of the nanoparticles can be changed by varying the anions in the material. “The structure of the material remains the same, we simply use another component in the synthesis of perovskite films. Therefore, it is not necessary to adjust the method each time. It remains the same, yet the emission color of our nanoparticles changes,” says Ekaterina. The scientists will continue research on light-emitting perovskite nanoantennas using various components for their synthesis. In addition, they are developing new designs of perovskite nanostructures which may improve ultra compact optical devices.

AVOIDING ELECTRONICS TOXICANTS: MULTIBILLION DOLLAR OPPORTUNITY

Alternatives to toxicants are an opportunity for tens of billions of dollars of business over the coming decade. That is just for electronics and electrics. Many toxicants are in, or arriving for, the manufacture, use, abuse and disposal of electronics and electrics over the coming decade. There is a flood of new electronic and electrical devices introducing toxicants very similar to those in tobacco smoke and diesel fumes and many not seen in either. Some devices containing them will sell at up to billions of units yearly with inevitably uncontrolled abuse and disposal. There has been no overall assessment of what is arriving, appraising toxicity and, equally important, likely prevalence. However, uniquely, the new IDTechEx report, **“Toxicant Materials and Alternatives in Electronics/ Electrics 2018-2028”** now does that. Coverage is wide ranging. The reader can scan current and future devices and the toxicants they will contain and the business opportunities that provides for alternatives. Particularly, the report looks at use and abuse, the major opportunity for alternatives, but there is also coverage of hazards of manufacture and disposal. Nickel cadmium batteries were banned but poisonous cadmium is reintroduced into daily life as huge sales of cadmium telluride photovoltaics on buildings and now millions of cadmium quantum dot television sets. The European Union has set a date for banning those television sets but most other jurisdictions have not - yet. LG and Samsung prefer indium-based quantum dots in their television sets and that will gain them sales.

Peak lead acid battery occurs soon: the report says when and why and recommends action to avoid them still being around in 30 years because their disposal continues to cause unnecessary deaths. For example, over 140 million e-bikes and e-scooters in China and India have lead acid batteries and they are in millions of three wheel e-taxis from the Philippines to Bangladesh wearing out in only nine months. Poisonous lead is reappearing this year in the first commercialisation of perovskite windows generating electricity, transducers, actuators, sensors, new uses for lead zirconatetitanatepiezoelectrics and in other places. **Raghu Das CEO of IDTechEx says**, “Lead replacement is a huge opportunity. For example, aluminium nitride, PVDF, and other piezoelectrics are being deployed in a small way with glycine demonstrating promise in the laboratory. Lead free perovskitephotovoltaics is improving in the laboratory. Metal-free dye sensitised solar cells with no ruthenium have high efficiency in one laboratory. Polyoxometallates may replace vanadium and bromine in redox flow batteries. These are only a few examples. Another is solid state electrolytes for lithium ion batteries which makes them non-flammable, better performing and less poisonous.” There are many more materials of concern, organic and inorganic, with physical or chemical poisonous action or both, that are appraised and tracked in the report, together with alternatives worth backing. Toluene and other dangerous volatile organic compounds VOC are used for electronic printing inks but Solvay Rhodiasolv is a biodegradable, ecofriendly, non-flammable alternative and GeorgiaTech demonstrates water based alternatives. Of course, with some devices such as bismuth telluride thermoelectrics and lithium-ion batteries there is no alternative anywhere near that can take most of the market but those are problems to be opportunity to be profitably addressed.

Sometimes toxicant removal is aided by voluntary local bans on the poisonous product or eliminating the device in circuitry. For example, there are many toxicants in lithium-ion batteries and possible successors for some of them also contain toxicants. The report therefore has a chapter on battery elimination in electronics or electrics, another huge business opportunity. It has already led to over one million items from light switches to electric vehicles having no battery and several studies have recently shown that battery-free national grids will be viable. The report recommends greater priority for these many alternatives to toxicants and a redirection of research funding. This report has dense summaries and infograms revealing the breadth of adoption and planned adoption of physically and chemically poisonous materials and particulates in electronics and electrical engineering. Make no mistake, this is a serious and escalating problem. There is even has a roadmap of introduction of toxicants in electronics and electrics from 2018-2028. Learn the lessons from the inadequate response to asbestos, tobacco and diesel in the past and in detail how most of those toxicants and others are reappearing. The report explains why toxicity measurements it lists are suspect. Moderate toxicity declared on mice when the substance of wrong morphology is administered in the wrong way for the wrong time and damage is measured after the wrong interval is no cause for humans to relax. 38 elements and compounds are tabled with toxicity, pathologies and devices where they are used or will be used and comments by suppliers. One chapter appraises materials being used in 37 families of emerging devices, 18 families of compound. It

tables where they are and where they will be used in volume. The chemical elements of concern in overall electronics and electrics are compared. There are tables of inorganics, organics and where they will be used indicating levels of concern in the assessment of the authors. Allotropes of carbon are compared in likely popularity and issues. Surface irritants including many of the new nanomaterials are physically poisonous materials that can often penetrate the human body and trigger changes leading to cancer and more. Although throughout the text there are alternatives given to the physical and chemical toxicants appearing in or promised in electronic and electrical devices, one chapter goes into depth on twelve other research programmes of particular promise for toxicant replacement in devices.

Read more at: <https://www.offgridenergyindependence.com/articles/13992/avoiding-electronics-toxicants-multibillion-dollar-opportunity>

GLOBAL SOLAR MARKET TO REACH OVER 106GW IN 2018 DUE TO STRONG MOMENTUM FROM CHINA AND REBOUNDED DEMAND IN EUROPE

China's solar market continued its explosive growth in 2017, pushing the size of global solar market to over 100GW for the first time. EnergyTrend, a division of TrendForce estimates that the worldwide demand will increase further in 2018 to 106GW, but the distribution of demand by region will change.

According to EnergyTrend's latest report, China's annual grid-connected PV capacity reached 52.83GW in 2017, the highest one all over the world. The U.S. came second place with 12GW. The number for Japan was only 6.09GW, as the result, India, which recorded 9.26GW, has surpassed Japan and ranked the third. With strong momentum from China, the market share of Asia Pacific in global solar market is estimated to hit a new high of 72% in 2017.

EnergyTrend analyst Rhea Tsao points out the year 2016 witnessed the highest growth of global solar market, an increase of 42.5% over the previous year. In 2017, the growth rate was 26%, pushing the market size over 100GW for the first time. "The growth over the past two years is led by explosive demand in China," says Tsao.

China Will See Two Installation Rushes in 2018 Due to Adjustment of FiT, and Europe will enter a recovery phase. The Chinese market continues to grow excessively, mainly driven by supportive policy and production capacity expansion. In particular, distributed generation (DG) systems, which are currently not subject to the quota of FiT, had an estimated grid connection of 19GW in 2017, more than 4 times of 4.23GW in 2016. According to recent announcement by the Chinese government, large-scale ground-mounted power plants will face stricter regulations, while DG systems and PV Poverty Alleviation projects will have more room for growth.

In addition, National Energy Administration (NEA) of China released the new feed-in tariff (FiT) for 2018 at the end of December 2017, and the adjustment will cut subsidies for solar PV systems. Ground-mounted projects that are filed before December 31st 2017 and completed before June 30th 2018 will be applicable to the 2017 FiT. Projects that are filed after January 1st 2018 and completed grid-connection in 2018 will be applicable to the 2018 FiT. Therefore, EnergyTrend forecasts that there will be two installation rushes by June 30th and December 30th 2018 in order to enjoy higher subsidies. NEA also announced quota of 5GW for the Top Runner Programme, which needs to be grid-connected before December 30th 2018. All of these quotas above will reach 33.1GW. The total annual grid connection, including ground-mounted projects, DG systems, PV Poverty Alleviation projects etc. is forecasted to reach 46.7GW in 2018, a slight decrease.

Tsao points out that the growth in Chinese market will slow down from 2018 to 2020. However, the European market will enter a recovery phase and become one of the major drivers to keep global solar market size above 100GW. Since 3Q18, large-scale ground-mounted power plants in France, the Netherlands and Spain will be completed and connected to the grid. In addition, Minimal Import Price (MIP) measurement of EU will end on September 30, 2018, making Europe a highly competitive market since then.

As for 2018, EnergyTrend estimates the global solar demand to reach 105.88GW. China will remain the largest market, and the European market will increase. Meanwhile, demands will come from different markets in every quarter of 2018, resulting in at least 15GW installations per quarter. Moreover, 4Q18 will see substantial demand increase due to the second installation rush in China.

GE-POWERED PLANT AWARDED WORLD RECORD EFFICIENCY BY GUINNESS

Guinness World Records has named the Chubu Electric Nishi-Nagoya power plant Block-1 in Japan – powered by GE's 7HA gas turbine – the world's most efficient combined-cycle power plant, based on achieving 63.08 percent gross efficiency.

In addition to the HA gas turbine, the plant utilizes Toshiba Energy Systems & Solutions Corporation's steam turbine and generator technology, and optimal overall plant system design and construction were achieved by Toshiba ESS.

With this latest achievement, GE's HA turbine has been recognized for powering the world's most efficient power plants in both the 50hz and 60hz energy segments. In June of 2016, GE Power and EDF were acknowledged by Guinness for delivering the world's most efficient combined-cycle plant in a 50hz segment, powered by the 9HA turbine. The facility, in Bouchain, France, achieved an efficiency rate of 62.22 percent net efficiency and was also the world's first combined-cycle plant equipped with GE's HA turbine.

"We're very proud to make history once again and to partner with Chubu and Toshiba to bring GE's industry-leading HA turbine to Japan," said Russell Stokes, president and CEO of GE Power. "Our HA technology enables the power plant of the future, delivering unprecedented levels of efficiency and reliability that can help countries everywhere meet today's power demands and reach more aggressive emissions goals."

GE supplied three 7HA.01 gas turbines to the Nishi-Nagoya Block-1 power plant, which provides more than 1,188 MW of power. GE's HA gas turbines are the fastest growing fleet of gas turbines in the world, and have achieved more than 88,000 operating hours of proven experience globally.

"To support manufacturing by providing a stable and inexpensive power supply in Chubu, Japan's central region, we have been making unrelenting efforts to construct power generation facilities that achieve the world's highest levels of output and efficiency," said Satoru Katsuno, President & Director of Chubu Electric Power. "We believe that our constant quest for innovation led to this Guinness World Records achievement."

Japan is currently in a transition to cleaner, more efficient power generation. Low-cost natural gas-fired combined-cycle power plants and renewables are becoming more important in the country as demand growth slows and utilities face more competition due to deregulation. When Chubu Electric was looking to replace its 40-year-old Nishi-Nagoya facility, it selected a higher efficiency and more flexible large block gas turbine that could support multi-combined-cycle operation, provide low NOx emissions, and run on liquefied natural gas. 7HA accommodates a wide range of gas and liquid fuels, including high ethane gas and LNG. Additionally, the 7HA can ramp up to full load in less than 30 minutes allowing for greater grid stability with renewable and alternative energy sources. The efficiency gains should help Chubu Electric reduce fuel costs and CO₂ emissions. GE supplied three more 7HA.01 gas turbines to Block-2 of the Nishi Nagoya facility, which is expected to achieve commercial operation at the end of this month. Japan along with the U.S. represent the largest 60Hz energy regions. GE already has two similar power plants fully commissioned in Texas that use 7HA technology, with many others coming online this year. Around the world, we will bring more than 30 HA units into commercial operation in 2018.

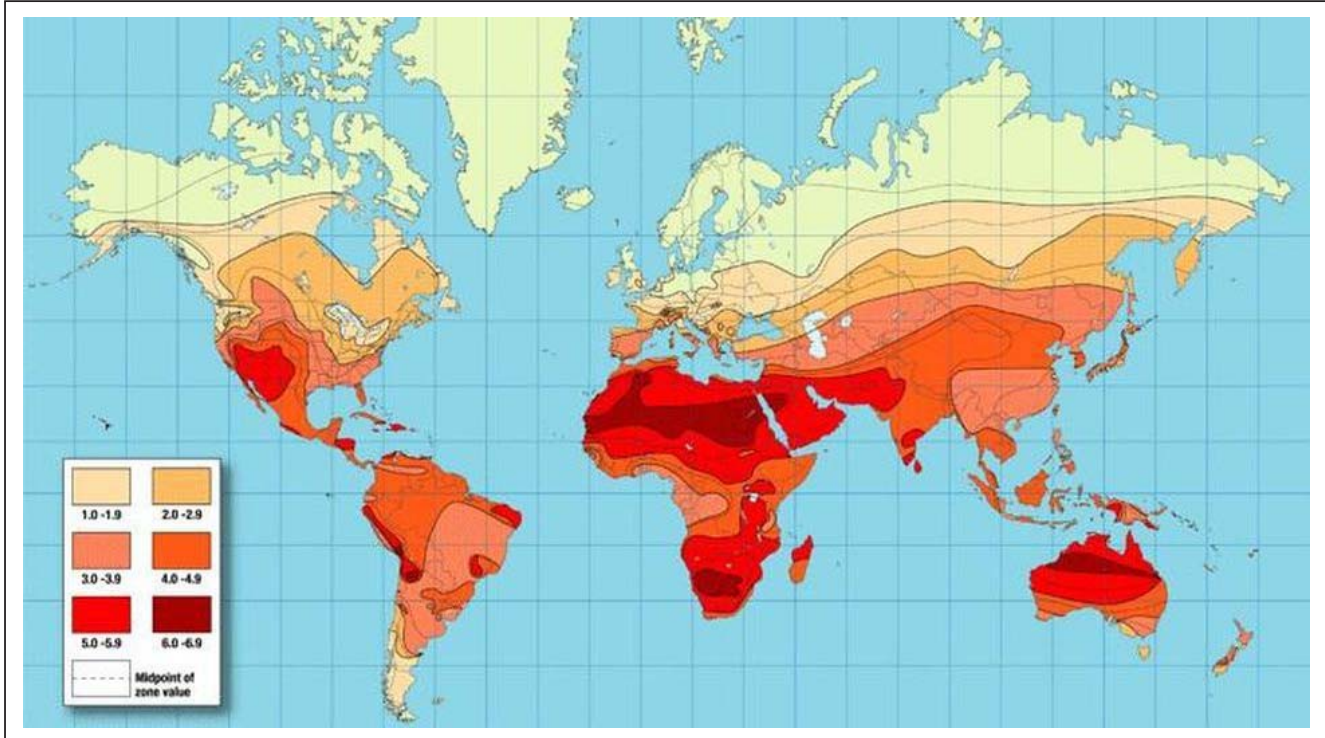


Only I can change my life. No one can do it for me - CAROL BURNETT

SAUDI ARABIA BETS ON A SOLAR FUTURE

Modern Saudi Arabia has been built on the back of petroleum — an ancient solar resource that has been stored for millions of years underneath the kingdom. The Ghawar oilfield is the largest conventional oilfield in the world, and Saudi Arabia has produced more oil over the past 20 years than any other country.

The world is still heavily dependent upon Saudi Arabia's oil, but it has been calculated that all of the world's energy needs could be met with solar panels on just 1.2% of the Sahara Desert. A map depicting global solar power resources shows the reason. There is no greater solar resource on the planet than a broad swath extending from the Sahara Desert of North Africa and into northwestern Saudi Arabia.



Given its solar endowment, Saudi Arabia has been looking to the future. The kingdom recently announced that it would invest up to \$7 billion this year to develop seven solar plants and a wind farm.

Now, in addition to the largest oilfield, Saudi Arabia plans to have the world's largest solar plant. This week, Japanese multinational conglomerate SoftBank and Saudi Crown Prince Mohammed bin Salman signed a memorandum of understanding for the massive project.

The scale is unprecedented. The \$200 billion project would produce 200 gigawatts of solar photovoltaic power. The project would create an estimated 100,000 jobs but would take more than a decade to complete.

To put the project's scale into perspective, U.S. solar PV capacity at the end of 2016 stood at 40 GW. The world's entire installed solar PV capacity at the end of 2016 was 300 GW. This plant would be 130 times larger than the world's current largest solar plant, the 1,547 megawatt (MW) Tengger Desert Solar Park in China.

Given Saudi Arabia's fossil fuel past, this project is also hugely symbolic. It indicates a country making a strong commitment to a different kind of energy future. It is also an indication that as the oil runs out, Saudi Arabia will remain one of the world's vital energy producers.

NATIONAL TECHNOLOGY DAY

National Technology Day is observed every year on 11th of May in India, acting as a reminder of the anniversary of Shakti. Shakti is the Pokhran nuclear test which was held on 11th of May, 1998. The day highlights the important role of Science in our daily lives and encourages students to embrace Science as a career option. Various events are organized in different technical institutes and engineering colleges to mark the day. Competitions, quizzes, lectures, interactive sessions and presentations of various aspects of Science are managed globally. The day is crucial for engineers, planners, scientists and others who are engaged in nation building and governance.

NATIONAL TECHNOLOGY DAY 2018

National Technology Day, 2018 will be celebrated in India on 11th of May, Friday.

About “Shakti, the Pokhran Nuclear Test”

The first nuclear test Pokhran with a code named as ‘Smiling Buddha’ was carried out in May, 1974. The second test conducted was Pokhran II which was a series of five tests of nuclear bomb explosions, administered by India at the Pokhran Test Range of Indian Army in May, 1998. Pokhran II comprised of five detonations out of which the first one was a fusion bomb while the other four were fission bombs. These nuclear tests evolved various sanctions against India by many major states, including United States and Japan.

Pokhran II or Operation Shakti was initiated on 11th of May, 1998 with the detonation of two fission bombs and one fusion bomb (meaning of the word “Shakti” is power in Sanskrit). Two additional fission bombs were detonated on 13th of May, 1998 and the Government of India run by Atal Bihari Vajpayee, the then Prime Minister shortly convened a press conference for the declaration of India as a full-fledged nuclear state. Various names were attributed for these tests with the original name kept as “Operation Shakti-98”, while the five nuclear devices were classified Shakti I through Shakti V. Recently, the whole operation is called Pokhran II and the explosion of 1974 is called Pokhran I.

HISTORY OF NATIONAL TECHNOLOGY DAY

National Technology Day is observed to memorialize the nuclear test which was held in Pokhran on 11th of May, 1998. This was a matter of pride for all the citizens of India. The day also praises the significance of Science in our day to day lives. It was on the 11th as well as the 13th of May in 1998 when India conducted five nuclear tests at Pokhran, Rajasthan. The initial five tests were conducted on 11th May when three nuclear bombs were exploded while recording an earthquake of 5.3 Richter scale in the nearby seismic stations. Remaining of the two tests were carried out on 13th May, since then National Technology Day is celebrated in India.

WHY NATIONAL TECHNOLOGY DAY IS CELEBRATED

On 11th of May, 1998, India victoriously test fired the nuclear missile – Shakti-I at the Pokhran Test Range of Indian Army in Rajasthan in an operation administered by late president and aerospace engineer Dr. APJ Abdul Kalam. After two days, the country victoriously tested two additional nuclear weapons. Following this, Prime Minister Atal Bihari Vajpayee announced India as a nuclear state, making it sixth country in the world that has joined the nations “nuclear club” and the first country that was not party to the Non-Proliferation of Nuclear Weapons Treaty (NPT). NPT is a global treaty signed by the UK, Russia, China, France and the US which has the objectives to prevent the increase of nuclear weapons and attain nuclear disarmament.

Becoming the sixth nuclear state of the world was not the sole thing India attained on that day. Hansa-3, India’s foremost indigenous aircraft was flown in Bengaluru when the nuclear tests were being organized in Rajasthan. Hansa-3 was developed by the National Aerospace Laboratories. It was a two-seater, light general aviation plane which is utilized in the flying institutes for sports, pilot training, aerial photography, surveillance and projects related to the environment.

That is not all. On 11th May, 1998, the Defense Research and Development Organization (DRDO) also accomplished the last test-fire of the Trishul missile, which was then introduced into service by the Indian Air Force and Indian Army. A surface-to-air, quick-reaction, short-range missile, Trishul was a unit of the Integrated Guided Missile Development Programme of India which has resulted in the formation of Prithvi, Akash and Agni missile systems.

Based on these immense breakthrough accomplishments by the engineers, scientists and technicians of the country, Atal Bihari Vajpayee announced 11th May as the National Technology Day.

HOW NATIONAL TECHNOLOGY DAY IS CELEBRATED

Every year the Ministry of Science and Technology celebrates National Technology Day on 11th May. The day is considered as a symbol of pursuit for technological creativity, scientific inquiry and the conversion of that pursuit in the integration of society, industry and science. Various events are organized in technical institutions as well as engineering colleges to acknowledge this great occasion. Presentations, interactive sessions, quizzes, lectures and competitions are also held. President of India presents National Technology Award to individuals as well as companies for their immense contribution to science.

Technology and science ministers also come forward to celebrate the day by organizing various kinds of events for the development of science in the country. On this day, students of India generally pay a visit to different laboratories to acquire information about the recent progress made in the areas of pharmacy, science and research work. Students also visit various computer labs, nano-technology and technology development centers accompanied with their teachers to get knowledge about the recent development in these institutions.

National Technology Day, as Celebrated on 11th May, 2017

On 11th May, 2017, the Ministry of Science and Technology observed the 19th function of National Technology Day. The function was held at Vigyan Bhawan in New Delhi in line with the theme kept for the year – Technology for Inclusive and Sustainable Growth.

Chief Guest for the event **Sh. Pranab Mukherjee, President of India and the Union Minister for Science and Technology and Earth Sciences – Dr. Harsh Vardhan presided over the event. Minister of State for Science and Technology and Earth Sciences – Sh. Y. S. Chowdary was the Guest of Honor.** The function highlighted that innovation is the engine for employment, national as well as global growth, sharing of opportunities and competitiveness in today's world. There was also a discussion on the need of technical innovations in agriculture, infrastructure, healthcare, education and energy. The event centered around the adaptation of new technologies in India in order to make it come ahead of other countries.

An exhibition was also held which taught about the future symphony of Technology Department Board (TDB) and interacted with the companies which were funded by the TDB on the period of 2016-17. An agreement was also signed between France and India to ensure the interchange of best technology and practices in the cabinet meeting which was chaired by Narendra Modi- Prime Minister.

SUGGESTIONS FOR CELEBRATING NATIONAL TECHNOLOGY DAY IN INDIA IN BETTER WAY

India accounts for around 10% expenditure in the field of research and development in Asia and the number of its scientific publications are also growing at a fast rate. However, our country is still lagging in science and technology in comparison with the other developed countries of the world. Even though it comprises of a huge population, the number of scientists in the country is very less. As globalization is empowering the country, it is imperative to have the technological industry in India reshaped to match up with the upcoming future challenges.

National Technology Day serves as the best platform to spread awareness about the importance of science and technology for the growth and development of India. Here are some suggestions to celebrate the day:

- Parents must educate their children about the famous scientists of India along with their discoveries. Such knowledge instills the importance of science in children and encourages them to choose it as their career. Children must also be encouraged to participate in science fairs, projects and quizzes held in their institutions. They can also play online science quizzes and games.
- People of the country must pay a visit to science and technology museums of the nation like National Science Center, Nehru Planetarium.
- News channels must present the importance of science and technology along with the live interviews with scientists who have made great contributions to the nation. There should also be panel discussions on the relevance of science with famous personalities in this field.
- People must read science-related magazines and even encourage others to read to and to get information on the use of technology in several fields like agriculture, pharmacy, infrastructure and health.

THEMES OF NATIONAL TECHNOLOGY DAY

Since 1999, every year the Technology Department Board (TDB) recognizes National Technology Day by saluting the technical innovations that have put a positive impact on the nation. TDB also selects different themes each year to celebrate the day.

National Technology Day, 2017 was marked with the theme “**Technology for inclusive and sustainable growth**”. The theme is kept to pay a tribute to scientists who have immensely contributed towards science and technology. It is also to honour those industrial concerns that have presented excellence in commercializing the primitive technology. The theme displays that technological and scientific developments are very important for the success of a nation.

India is amongst the top-ranking countries of the world in the area of basic research. Science in India has progressed to be amongst the strongest instruments of knowledge. However, in the wake of some new demands in economic development, it is crucial to embark on converting technology and science into the development needs in each and every sector including agriculture, education, communication, infrastructure and health. The theme is kept in line with the recent technological demands and advancements.

- Theme of National Technology Day 2017 was “Technology for inclusive and sustainable growth”.
- Theme of National Technology Day 2016 was ‘Technology enablers of Startup India’.
- Theme of National Technology Day 2014 was ‘Inclusive Innovation for India’.
- Theme of National Technology Day 2013 was “Innovation – making a difference”.

Conclusion

India has discovered some of the greatest scientific minds in world history. Technology is the national passion, be it constructing primitive nuclear capabilities or building its own combat light aircraft-Tejas, the scientists of India have expressed that our defense technology is not less than others. From space exploration to defense, India has moved ahead in technology. Let us take some recognized examples like the success of the space probe that reached the orbit of the moon in the year of 2008 – Chandrayaan 1, you can also look at Mangalyaan – an outstanding example of the cutting-edge, low-cost technology driven by our passionate scientists. India indigenously discovered its foremost super computer PARAM 800 in 1991- which is a giant stride in the super-computing world. Millions of people in India are today tech savvy and our country is amongst the largest markets for tablets, smartphones and computers. Indians and the Indian origin technicians make up a considerable percentage of population in the Silicon Valley. The entire world still looks at the country for more technical solutions and breakthroughs.

National Technology Day is the ideal occasion to boost the citizens to explore the stellar world of technology, to step forward and take our right place as the leaders of technological innovations and scientific development in the world.

HUMOUR - In tune with Technology Day

What do you call a computer floating in the ocean?

A Dell Rolling in the Deep.

What is written on Steve Jobs tombstone?

iCame, iSaw, iConquered, iLeft, iCameBack, iThinkDifferent, iMac, iPod, iTunes, iPhone, iPad, iCloud, iRIP

Why do Java developers wear glasses?

Because they don't C#.

What do you call a ride sharing app that serves breakfast?

Eggs Uber Easy.

What do you call having your grandma on speed dial?

Instagram.

What did the cat on the smart phone say?

Can you hear meow? Because it left its windows open.

What is an astronaut's favorite place on a computer?

The Space bar!

What do you call a woman you married off the internet?

Wife-I.

How do you get a computer drunk? A Screenshot of Tequila.

What happens when a Buddhist becomes totally absorbed with the computer he is working with? He enters Nerdvana.

Why did Mark Zuckerberg visit Beijing, China?

To see the “Great Firewall”.

Why are PCs like air conditioners?

They stop working properly if you open Windows!

What was the hipster doing at the computer?

Looking in the recycling bin for something retro.

Why was the computer tired when it got home?

It had a “hard drive”

Why do they call it the PS4?

Because there are only 4 games worth playing!

What do you call a country with slow internet speeds?

America Online.

ENERGY, ELECTRICAL ENERGY AND RENEWABLE ENERGY – 8

**Sustainable Growth, Sustainable Electrical Energy and Renewable Energy
Thermo Chemical Technologies – Carbonization Technologies – To Produce Carbon
Flakes or Fine Powder forms of Carbon**

Carbonization Technology:

In the family of Thermo Chemical Processes, “Multi Stage, Multi Hearth” Carbonization is one of the simple and quite effective Technology for production of Carbon from another kind of biomass solids which are in small sizes or lumps or animal and bird wastes or shells of nuts like coconut or tender coconut or areca nut or many such materials with varying degrees of sizes and moisture content. Some of the types of Biomass mentioned are illustrated below:



Waste coconut peels



Poultry Litter



Areca nut peels



Coconut and Areca Bunch wastes

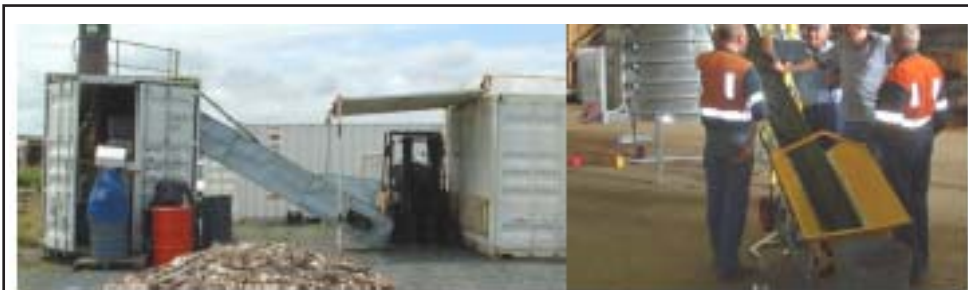
Combustion Technologies are applicable for all these materials, but when the quantities are not large enough and transport being quite difficult and costly, decentralized Carbonization can be an efficient solution.

In brief, this is a technology of controlled burning, segregating the carbon and the process resulting in production of Carbon, Ash which can be used as Fertilizer, waste heat which can be used for preheating of the biomass stock and smoke which is scrubbed and let out.



Multi stage Multi Hearth Gasification Equipment

Up Draft Multi stage Multi Hearth Gasification Processes are employed successfully which has a process efficiency of 80%. The Biomass is burned in a controlled environment that allow complete combustion, but low enough to avoid agglomeration and slagging in the ash and exhaust. The resultant ash is converted to a concentrated fertilizer, with contents of phosphorous, potassium, calcium, magnesium and other valuable micronutrients, depending on the biomass used in carbonization. Many of the Biomass mentioned in this article are rich in Phosphorous and Potassium, which very valuable.



Carbonization Plant with feeding collection

The Process is quite efficient and effective for various kinds of Biomass and the examples of Biomass discussed have all calorific values of about 2500 to 3000 K. Cal/Kg. The waste heat let out ranges at about 1500 K.Cal/Kg

Waste heat is given out by the process which can be harnessed and used to increase the overall efficiency.

The flue is water scrubbed to ensure safe quality of exit gas. Wet scrubber performance efficiency for emissions reductions is 95–99.99% for HCl, Cl₂, SO₂, HF and particulates. This creates a very clean exhaust that meets all relevant EPA /PCB standards.



Waste Heat recovery and use plant – used for drying

The particulates captured in the scrubber is sedimented and mixed with Ash and wet granulated into organic fertilizer. It is very important to note that this process does not result in any air or liquid effluent.

(To be continued)



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17 MAY 2018, WORLD TELECOMMUNICATION AND INFORMATION SOCIETY DAY (WTISD 2018)

Theme 2018: Enabling the positive use of Artificial Intelligence for All

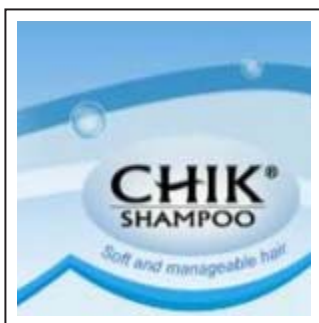
Enabling the positive use of Artificial Intelligence for All is the theme of WTISD-18 and will focus on the potential of Artificial Intelligence (AI) to accelerate the United Nations' Sustainable Development Goals (SDGs).

In recent years there has been significant progress in AI technology, made possible by tremendous advances in contributing fields, such as Big Data, machine learning, computing power, storage capacity and cloud computing, among others. AI-based technologies are already emerging as a key component of proactive tools and applications being used to help people lead better lives by improving healthcare, education, finance, agriculture, transportation, and a wide range of other services.

The 2018 theme will allow ITU Membership and other key stakeholders to focus on the opportunities for how AI can help accelerate the achievement of the SDGs by 2030.

WTISD-18 will coincide with the second edition of the Artificial Intelligence for Good Global Summit at the ITU headquarters in Geneva, Switzerland.





“Success is a journey not a destination. He began with a young mind choosing the road less taken”.

A pioneer of innovation CK Ranganathan MD, Cavin Kare who started up, made mistakes, learnt and followed the basic rules of the game. He has shown the world it is possible to beat the multinationals even in the most difficult market of fast moving consumer goods and

today he is an inspiration for young entrepreneurs. A business which was started with only with Rs. 15,000 is now worth Rs. 500 crore. He learnt the first entrepreneurial lessons from his father, Chinni Krishnan, who started a small-scale pharmaceutical packaging unit. He says, “Teamwork and innovation is the main reasons for our success, also we have good professionals who work really hard. “I was very clear that I did not want to mess up my focus by getting involved in production when there are highly skilled and competent people to do the job for you. My focus was to build brands, be hands-on where marketing and distribution was concerned”. **After a challenging start he finally set up ‘Chik India’ in 1983. Today Chik is the second largest shampoo brand after Clinic Plus.**

He has great admiration for those who fight against all odds and attain success. CavinKare’s CSR initiatives and his endeavour of philanthropy like caring for disabled persons of the society, providing quality education for deserving students of rural sections recognizing small time entrepreneurs with innovative ideas and concepts. He also patronises various schools and colleges aim to impart world class professional education to the people. He also received various awards including **“Entrepreneur of the Year award,” “Chinni Krishnan Innovation Awards”** etc.

He is widely regarded as the man behind the sachet revolution. Understanding customers and their needs, and translating those into direct innovations, makes us what we are “Continuous innovation, hands-on experience with consumers, timely remuneration of employees and vendors, understanding the various tradeoffs in the business, honouring loan repayment dates and avoiding tax evasion should be the crore practices of any business,” said Ranganathan. That earned CKR, as he is popularly known, **“The reputation of being superfast in spotting new opportunities”**.

HUMOUR

ID...

A skeleton walks down empty Main Street. Suddenly he sees another skeleton carrying a gravestone. “Hey, what are you doing?” The other skeleton answers “Just strolling”. “Why do have the gravestone, buddy?”. “Because I always want to have some ID”.

PROFESSIONALS AT WORK

The graduate with a science degree asks, “Why does it work?”
The graduate with an engineering degree asks, “How does it work?”
The graduate with an accounting degree asks, “How much will it cost?”
The graduate with an arts degree asks, “Do you want fries with that?”

FOREIGN LANGUAGE

A mother mouse and a baby mouse were walking along, when all of a sudden, a cat attacked them. The mother mouse goes, “BARK!” and the cat runs away.
“See?” says the mother mouse to her baby. “Now do you see why it’s important to learn a foreign language?”

We must let go of the life we have planned, so as to accept the one that is waiting for us -

JOSEPH CAMPBELL

குஜராத் மாநிலத்தில் மழைப் பொழிவு குறைவாக இருப்பதால் அங்கே தண்ணீர் பிரச்சினை எப்போதும் இருந்திருக்கிறது. தண்ணீர்ப் பிரச்சினையைச் சமாளிக்க படிக்கிணறுகள் அமைக்கும் வழக்கம் கி.பி 4-ம் நூற்றாண்டிலிருந்து 18-ம் நூற்றாண்டுவரை இருந்திருக்கிறது.

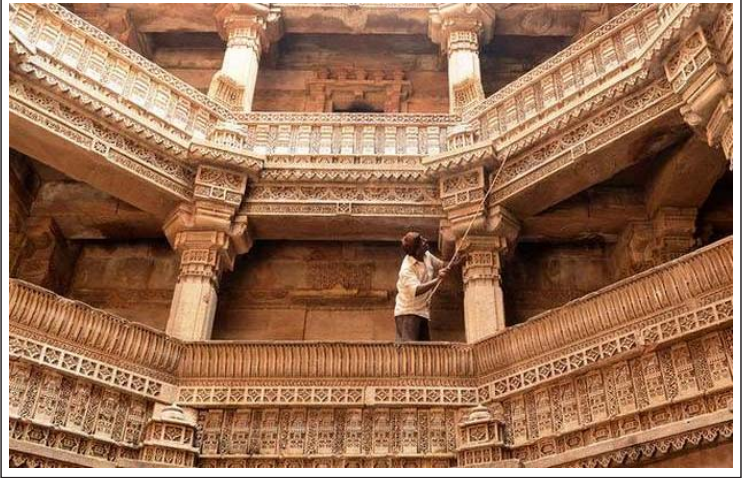
அகமதாபாத்திலிருந்து 110 கி.மீ தூரத்தில் இருக்கிறது **பதான் நகரம்**. பசுமையான புல்வெளிக்கு நடுவே '**ராணி கி வாவ்**' எனப்படும் மிகப் பிரம்மாண்டமான படிக்கிணறு அமைந்துள்ளது. படிக்கிணறுகளின் ராணி என்றே இதை அழைக்கலாம். உலகப் பாரம்பரியச் சின்னங்களில் இதுவும் ஒன்றாக அறிவிக்கப்பட்டு, **யுனெஸ்கோ** மூலம் பராமரிக்கப்பட்டு வருகிறது.

சோலாங்கி வம்சத்தைச் சேர்ந்த முதலாம் பீம்தேவ் மன்னரின் நினைவாக அவருடைய மனைவி ராணி உதயமதியால் இந்தப் படிக்கிணறு ஆரம்பிக்கப்பட்டது. இவர்களுடைய மகன் முதலாம் கர்ணதேவ் மூலம் கட்டி முடிக்கப்பட்டது.

64 மீட்டர் நீளமும், 20 மீட்டர் அகலமும், 27 மீட்டர் ஆழமும் கொண்ட இந்த படிக்கிணறு, 7 அடுக்குகளாகக் கட்டப்பட்டுள்ளது. கடைசிப் படிக்கட்டுக்குக் கீழே 30 கி.மீ நீளமுள்ள சுரங்கப் பாதை சித்பூருக்குச் செல்கிறது. போர்க் காலங்களில் அரசு குடும்பத்தினர் தப்பிச் செல்வதற்காகக் கட்டப்பட்டிருக்கிறது.

கி.பி 1063 முதல் 1068 வரை இந்தக் கிணற்றைக் கட்டியிருக்கிறார்கள். காலப் போக்கில் இந்தப் படிக்கட்டு கிணறு கற்களாலும் மணலாலும் மூடப்பட்டுவிட்டது. இதனால் நீண்ட காலம் மக்களுக்கு இந்தப் படிக்கிணறு பற்றித் தெரியாமலே போய்விட்டது. 1960-ம் ஆண்டு தொல்லியல் துறையால் கண்டுபிடிக்கப்பட்டு, பொதுமக்களின் பார்வைக்கு விடப்பட்டது.

விஷ்ணுவின் தசாவதாரங்கள், புத்தர், முனிவர்கள், நாகக் கன்னிகைகள், கண்ணாடியைப் பார்த்து பொட்டு வைக்கும் பெண், யானைகள் போன்று 800க்கும் மேலான சிற்பங்கள் பக்கவாட்டுச் சுவர்களில் கலை நயத்துடன் செதுக்கப்பட்டுள்ளன. தூண்களிலும் அழகிய வேலைப்பாடுகள் நிறைந்துள்ளன. கிணற்றுக்குச் செல்லும் படிக்கட்டுகள் நேராக இல்லாமல் பக்கவாட்டில் ஏறவும், இறங்கவும் வசதியாக அமைக்கப்பட்டிருக்கின்றன.



மழை நீரைச் சேமிக்கும் இடமாகவும் இந்தப் படிக்கிணறுகள் இருந்திருக்கின்றன. 700 கிணறுகள் வரை இருந்திருக்கலாம் என்கிறார்கள் ஆராய்ச்சியாளர்கள். இதுவரை 120 படிக்கிணறுகள் கண்டறியப்பட்டுள்ளன.

குஜராத் தலைநகர் காந்தி நகரிலிருந்து 18 கி.மீ. தூரத்தில் அமைந்துள்ள அடாலஜ் நகரில் உள்ள படிக்கிணறும் புகழ்பெற்றது. இது 5 அடுக்குகளாகக் கட்டப்பட்டுள்ளது. தரை மட்டத்திலிருந்து அகலமான படிகளில் இறங்கிய பிறகு தூண்களுடன் கூடிய மண்டபம் உள்ளது. தூண்களிலும், சுவர்களிலும் அழகிய சிற்பங்கள் செதுக்கப்பட்டுள்ளன.

5 மண்டபங்களுக்குக் கீழே நீச்சல் குளம் அளவுக்குக் கிணறு வெட்டப்பட்டுள்ளது. கிணறு செவ்வக வடிவில் இருந்தாலும் மேல் கூரை முக்கோண வடிவில் உள்ளது. மேலே முழுவதுமாக மூடப்படாமல். சூரிய வெளிச்சமும் காற்றும் வரும்படி அமைக்கப்பட்டிருக்கிறது. அதனால் படிக்கிணறு குளிர்ச்சியாகவே இருக்கிறது.

தொழில்நுட்பம் இல்லாத காலகட்டத்தில் நம் முன்னோர்களின் மதிநுட்பத்தையும் கட்டிடக்கலையின் சிறப்பையும் இந்தப் படிக்கிணறுகள் எடுத்துக் காட்டிக் கொண்டிருக்கின்றன!

தொடர்புக்கு: ஆம்பூர் மங்கையர்க்கரசி, mangai.teach@gmail.com

Courtesy: தி இந்து, தேதி: 11.10.2017



வாரம் 3 முறை இத குடிச்சா, சர்க்கரை நோய் மற்றும் அடிவயிற்று கொழுப்பு மாயமாய் மறையும்!

உலகில் சர்க்கரை நோயால் ஏராளமான மக்கள் அவஸ்தைப்படுகின்றனர். அதிலும் ஹைப்பர்கிளைமியா என்னும் உயர் இரத்த சர்க்கரையால் உலகில் ஆயிரக்கணக்கான மக்கள் கஷ்டப்படுகின்றனர். ஒருவரது உடலில் சர்க்கரையின் அளவு அதிகமானால், அது கொழுப்புக்களாக உடலில் தேங்க ஆரம்பித்து, உடல் பருமனை உண்டாக்கும். உடல் பருமனுடன் சர்க்கரை நோயும் இருந்தால், அதைவிட கொடுமை வேறு எதுவும் இருக்க முடியாது.

பொதுவாக சர்க்கரை நோய் மோசமான உணவுப் பழக்கம் மற்றும் வாழ்க்கை முறையால் வருவதால், அவற்றை சரிசெய்து கொண்டு, இரத்த சர்க்கரை அளவையும், உடல் பருமனையும் குறைக்கும் ஏதாவது ஒரு செயலில் ஈடுபட்டால், விரைவில் நல்ல மாற்றத்தைக் காணலாம். இக்கட்டுரையில் உயர் இரத்த சர்க்கரை மற்றும் உடல் பருமனைக் குறைக்க உதவும் ஓர் அற்புத பானம் குறித்து கொடுக்கப்பட்டுள்ளது.

தேவையான பொருட்கள்: கற்றாழை 1 கொத்து, அன்னாசிப்பழம் 2 துண்டுகள், செலரி – சிறிது, ஆரஞ்சு ஜூஸ் - 1 கப், ஆளி விதை – 2 சிறிய ஸ்பூன், பார்ஸ்லி 1 கையளவு

செய்முறை: கற்றாழை, அன்னாசி போன்றவற்றை

நன்கு கழுவி, தோலை நீக்கிவிட்டு துண்டுகளாக்கி மிக்ஸியில் போட்டு, அத்துடன் இதர பொருட்களையும் போட்டு நன்கு அரைத்துக் கொண்டால், பானம் தயார்.

குடிக்கும் நேரம்: இந்த பானத்தை தயாரித்த உடனேயே குடிக்க வேண்டும். இல்லாவிட்டால், அதை ஃப்ரிட்ஜில் வைத்து பின் குடிக்கலாம். வெளியே நீண்ட நேரம் இந்த பானம் இருந்தால், அது அந்த பானத்தில் உள்ள மருத்துவ குணத்தை இழக்கச் செய்துவிடும். முக்கியமாக இந்த பானத்தை வாரத்திற்கு மூன்று முறை, அதுவும் காலையில் வெறும் வயிற்றில் குடிப்பதே மிகவும் நல்லது.

நன்மை: 1. இந்த பானம் இரத்தத்தில் உள்ள அதிகப்படியான சர்க்கரை அளவை வேகமாக குறைக்க உதவும்.

நன்மை: 2. உடல் பருமனால் அவஸ்தைப்படுபவர்கள் இந்த பானத்தைக் குடித்து வருவது மிகவும் நல்லது. இதனால் எடை வேகமாக குறைவதோடு, இரத்த சர்க்கரையும் அதிகமாகாமல் இருக்கும்.

குறிப்பு: இந்த பானத்தை குடிக்க ஆரம்பித்தால், நல்ல ஆரோக்கியமான உயர், தினமும் உடற்பயிற்சி மற்றும் 2 லிட்டர் நீரை தவறாமல் குடிக்க வேண்டும். மேலும் அவ்வப்போது மருத்துவரை அணுகி இரத்த சர்க்கரை அளவைக் கண்காணிக்கவும் வேண்டியது அவசியம்.

HUMOUR

Everything is becoming LESS but still our hopes are Endless.

In fact I am - Speechless

The technopathic cure

(Such dialogues are common and meaningful, but the joke is at the end!)

No other branch of medicine has leveraged technology the way allopathy has done, claims a youngster, taking on his older counterpart.

AD: Hi, so how's your migraine now? Did you see the doctor?

BC: I did, he's given me some oil and a powder mix that needs to be taken with...

AD: Why didn't you go see an allopathic doctor? What if a scan or some tests have to be done?

BC: I prefer natural medicines - they have no side effects.

AD: Wouldn't it have been better to be diagnosed and treated by a proven branch of medicine that's backed by technology?

BC: Well, natural forms of treatment originated long before allopathy, but are still relevant - doesn't that tell you how effective and well-thought out they are?

AD: Sure, but today, we're afflicted with so many complications – and it takes technology to identify them.

BC: Maybe, but not all ailments need technology...

AD: It's not about using technology in isolation - it's about integrating it with every aspect of medicine. The Western system has intensive research done which is aided by technology, and billions of dollars are spent every year in understanding symptoms and producing medicines...

BC: But after all the diagnosis, it's the pharma companies that dictate the cure, don't they? It's become a money spinner...

AD: You're deviating - we're talking about the efficacy of the treatment and how technology aids it.

BC: Allopathy has the backing of the Western world and that explains its popularity...

AD: Incidentally, the West has now pioneered an advanced form of laser surgery to remove brain tumour based on a new technology called SRS microscopy that allows them to see the minutest portions of the brain tissue. And SRS stands for

Stimulated Raman Scattering, named after Sir C V Raman. So there's an Indian influence there as well...

BC: That's an honour to the great man, but it's a fact that in our bid to look for quick relief, we're ignoring our wonderful healing systems...

AD: What about fields like gynaecology and obstetrics? Imagine where we would be if technology didn't result in Doppler ultrasonography or CT scans...

BC: Sure, but for thousands of years before scan centres came up, women have been delivering babies. Since we have the technology, we're trying to make use of it.

AD: Speaking of scans, do you know that the imaging technologies available in operation theatres are now accessible to general physicians too? A handheld device based on a technology called Optical Coherence Tomography (OCT) is now empowering them to...

BC: Sorry, but OCT is all OHT to me.

AD: And what about robot-assisted surgery? It can pull off the most intricate surgery with precision...

BC: Look into our ancient medical treatises – several complicated surgeries have been recorded. And they were done before modern technology came into existence.

AD: However, remote surgical intervention is a modern concept surely... I read an article about a doctor in New York performing a gallbladder operation on a patient in France. It calls for computers, artificial intelligence and...

BC: All I can say is that we are endowed with a lot of natural intelligence to fall back upon, so...

AD: Isn't it true that a branch of medicine like homeopathy actually gives you the disease-causing substance in small, diluted doses? There have been several questions raised regarding this...

BC: If that's the case, PET - Positron Emission Tomography - scanning involves injecting the patient with a small dose of radioactive material. Would you rather accept that?

AD: Think of it as technology's miracle, because the effects are the same as that of an X-ray. I can continue telling you about how technology has aided remote surgery through the Asynchronous Transfer Mode, or ATM...

BC: The ATM has another big role to play as well...

AD: What's that?

BC: With medical treatment becoming prohibitively expensive, it's the first place every patient will need to visit before he goes to a hospital.

WALKING FOR HEALTH

*This is what happens when you walk
5, 30 and 60 minutes*



Do you know **walking** is one of the world's best medicine? It's one of the most overlooked activities that's extremely beneficial to your **health**.

Today, there are so many means of transportation that have taken the place of walking – they allow us to take less and less steps each day, and that's not good.

It's critical for us to **walk** more – those overlooked steps are essential for our overall health and wellness.

Look, you should know that the body creates **chemical** changes the longer you walk – once you realize these benefits, you'll be inspired to walk more.

The good thing is, there are a whole lot of **opportunities** for us to walk every single day – you can decide to walk to the grocery store instead of drive or walk to lunch instead of taking the wheels.

Right now we're going to explore how walking for 5, 30 or even 60 minutes can **transform** your health and make you feel great. Sounds good? let's get to it!

What happens when you walk for:

1 to 5 Minutes – The moment you step out of the door to take your first steps, your body will release **energy**-producing chemicals to fire you up for the walk.

When you start walking, your **heart rate** will increase from 70 to 100 beats per minute – this beneficial change warms the muscles and boosts **blood flow**.

You'll also find that **stiffness** reduces, and this is all thanks to the lubricating fluid that your joints produce – this will help you move more easily.

At this point, your body starts to burn up to five calories per minute – fats and carbohydrates will be used as fuel to burn energy.

6 to 10 Minutes – At this time period, your **heartbeat** goes all the way from 100 to 140 beats per minute. And you'll start burning up to six calories per minute. Right now, your blood pressure will spike up a little but still gets countered by the release of chemicals that expand **blood vessels**. This then supplies more blood and oxygen to working muscles.

Look, as you walk more, your body, heart and **cardiovascular** system will have what it takes to maintain resiliency, and your blood pressure lowers in the long run.

11 to 20 Minutes – Right now your **body temperature** increases and that's a good thing. Why? Well, it's primarily because you begin to sweat and the blood vessels near the skin expand to release heat. As your walk becomes more intense, you'll burn up to seven **calories** per minute and breathe deeper than before.

At this point, two hormones, **epinephrine** and **glucagon** rise to fuel your muscles.

For the most part, epinephrine is an adrenaline hormone that provides relief to asthma attacks and allergic reactions – it's actually sold in drug stores. The good news is, you can get it for free after a 20 minute walk!

21 to 45 Minutes – This is the point where your body releases more tension and **relaxes** further. This typically happens as a result of the release of endorphins in your brain.

The good thing is, you'll get to burn more fat at this stage and **insulin** levels drop significantly. This is great for people looking shed excess weight – so be sure to keep up if you're one of them!

45 to 60 Minutes – At this point, you're exceeding all previous benefits for longer – boosting blood flow, burning more calories and **oxygenating** your body.

It's also good to know that you're also fortifying your **heart**, losing unhealthy fat, strengthening your immune system, increasing vitamin D levels (since you're in the sun) and feeling great.

Moreover, studies have shown that walking is just as effective as antidepressants – it eases **stress** and **anxiety**. Who wouldn't want to experience these amazing benefits?

The bottom line: Try as much as possible to walk more often – you can even turn it into a daily routine. Your body will feel great at the end of the day, and that's what matter. **Happy walking!**



ராஜ்மா என்ற பெயரில் நாம் அறிந்த உணவுப் பண்டம், சப்பாத்திக்குத் தொட்டுக்கொள்ளும் ஒரு வகை பிரட்டல். மோட்டாவான பயறு விதையைக் கொண்டு செய்யப்படும் இந்தப் பிரட்டலின் பெயரே, அந்தப் பயற்றுக்கான பெயராகவும் மாறிவிட்டது. இன்றைக்கு இந்தியா முழுவதும் அந்தப் பிரட்டலின் பெயரிலேயே, சுவை மிகுந்த அந்தப் பயறு விதையும் அழைக்கப்பட்டு வருகிறது.

தமிழகத்தில் அதிகப் புழக்கத்தில் இல்லாத பயறு வகை இது. கிடைக்கும் பயறு விதைகளிலேயே மிகப் பெரியதும் கூட. சிவப்பு, பழுப்பு கலந்த நிறத்தில் சிறுநீரகத்தைப் போலவே இருக்கும். அதனால் ஆங்கிலத்தில் கிட்னி பீன்ஸ் எனப்படுகிறது. வடஇந்தியாவிலும் மெக்சிகோவிலும் அதிகம் பயன்படுத்தப்படுகிறது. சப்பாத்தி போன்ற வட இந்திய உணவுகளுடன், சமீபகாலமாக இந்தப் பயறு வகையும் பிரபலமாகியுள்ளது.

பயன்பாடு

பெரிதான இந்தப் பயறு விதையை, மிக நீண்ட நேரம் ஊற வைக்க வேண்டும், இல்லையென்றால் வேகாது. இந்தப் பயற்றின் தோலில் சில நச்சுப்பொருட்கள் இருக்க வாய்ப்பு உண்டு. வேக வைக்கும்போது இது வெளியேறி விடும். சிவப்பு ராஜ்மாதான் பரவலாகக் கிடைக்கிறது. இது சாலட், பிரட்டல், குழம்பு, கெட்டிக் குழம்புகளில் பயன்படுத்தப்படுகிறது. இதைத் தனியாகச் சாப்பிடுவதைவிட, மற்றத் தானிய உணவு வகைகளுடன் சேர்த்துச் சாப்பிடும்போது ராஜ்மாவில் உள்ள புரதம் முழுமையாக உட்கிரகிக்கப்படும்.

ஊட்டச்சத்து

ராஜ்மாவில் பொட்டாசியம், மக்னீசியம் போன்ற கனிமச்சத்துகள் அதிகம்.

இதில் இருக்கும் நார்ச்சத்து, கெட்ட கொழுப்பின் அளவை குறைக்கக் கூடியது. மலத்தின் அளவையும் பெருக்கும்.

கரையக்கூடிய நார்ச்சத்து இதில் அதிகமாக இருக்கிறது. உயர் ரத்தஅழுத்தத்தை கட்டுப்பாட்டில் வைத்திருக்க இந்த நார்ச்சத்து உதவும்.

ஆங்கிலத்தில்: Kidney Beans

தாவரவியல் பெயர்: Phaseolus vulgaris

இதிலுள்ள அதிகப் புரதம், ரத்தசர்க்கரை அளவை மெதுவாக அதிகரிக்கும். அதன்மூலம் உடலின் ரத்தசர்க்கரை அளவை ஆரோக்கியமாகப் பராமரிக்கலாம்.

இதில் உள்ள இரும்புச்சத்து உடலுக்கு அதிகச் சக்தியைத் தரும், செரிமானத்துக்கும் உதவும்.

இதைத் தொடர்ந்து பயன்படுத்திவந்தால் இதயத்தை வலுப்படுத்தும். இதிலுள்ள ஃபோலேட், இதய நோய்களுக்கு ஒரு காரணியான 'Homocysteine' அளவை குறைப்பதாக ஆய்வுகள் தெரிவிக்கின்றன.

ஃபோலேட் சத்து கர்ப்பிணிகளுக்கும் உகந்தது. குடல் பகுதிகளில் நல்ல பாக்டீரியாவின் எண்ணிக்கையை அதிகரித்து, குடலுக்கு வலிமையைக் கொடுக்கும்.

அத்தியாவசிய வைட்டமின் சத்துகள் இதில் அதிகம். இந்த வைட்டமின்கள், மூளையின் செயல்பாடுகளை மேம்படுத்துவதாக நம்பப்படுகிறது.

இதில் எதிர்-ஆக்ஸிகரணப் பொருள் (ஆன்டி ஆக்சிடண்ட்) அதிகம்.

தெரியுமா?

மற்றப் பயறு, பட்டாணி வகைகளைப் போல் ராஜ்மாவை முளைகட்டிப் பயன்படுத்த முடியாது. ஏனென்றால், இது ஊறுவதற்கே நீண்ட நேரம் பிடிக்கும்.

மைசூருக்கும் பருப்புக்கும் என்ன சம்பந்தம்?

மைசூர் பருப்பு, மைசூர் பருப்பு என்று சொல்லக் கேட்டிருப்போம். மைசூருக்கும் இந்தப் பருப்புக்கும் எந்தச் சம்பந்தமும் இல்லை. இந்தியில் மசூர் தால் எனப்படும் பருப்பு, தமிழகம் வந்தபோது மைசூர் பருப்பாகிவிட்டது. துவரம் பருப்பைப் போன்ற தோற்றத்துடன், ஆரஞ்சு நிறத்தில் காணப்படும் பருப்பு இது. தமிழகத்தில் பரவலாகப் பயன்படுத்தப்படுவதில்லை என்ற போதிலும், கொஞ்சம் கொஞ்சமாக இது அறிமுகமாகி வருகிறது. இந்தப் பருப்பு எகிப்தைச் சேர்ந்ததாகக் கருதப்படுகிறது. கி.மு. 11,000 ஆண்டிலிருந்து கிரேக்கர்கள் மசூர் பருப்பைப் பயிரிட்டு வந்ததாக நம்பப்படுகிறது.

பயன்பாடு

சோறு, சாப்பாத்தியுடன் சேர்த்தோ அல்லது சூப்பின் சுவை, மணத்தைக் கூட்டவோ இந்தப்

பருப்பு பயன்படுத்தப்படுகிறது. வடஇந்தியாவில் கிச்சடி தயாரிப்பில் அரிசியுடன் இந்தப் பருப்பும் சேர்க்கப்படுகிறது. இதை நீண்ட நேரம் ஊற வைக்க வேண்டியதில்லை. விரைவாக வெந்துவிடும்.

ஊட்டச்சத்து

இதில் புரதம் அதிகமென்பதால், விலங்கு புரதத்துக்குச் சிறந்த மாற்று. முளைகட்டிப் பயன்படுத்தினால் புரதக் கூறின் முழு பயன்களையும் பெறலாம்.

அதிக நார்ச்சத்து உண்டு. உடலில் சேர்ந்த கெட்ட கொழுப்பை நீக்க இது உதவும்.

இது சிறந்த ஆன்டி ஆக்சிடண்டும்கூட.

உடலுக்குத் தேவையான இரும்புச் சத்து, சுண்ணாம்புச்சத்தைத் தருவதால் ரத்த ஓட்டத்தை அதிகரிக்கும். உடலின் ஆற்றலை எளிதில் மீட்டெடுக்க உதவும்.

உணவு எதிர்க்களிக்கும் தொந்தரவுகளுக்கு இந்தப் பருப்பு தீர்வு தரும். இதைக் கொண்டு பித்த நீர்சுரப்பை முறைப்படுத்துவது பற்றி சில ஆய்வுகள் நடைபெற்றுக் கொண்டிருக்கின்றன.

இந்தப் பருப்பை மசித்து முகப்பூச்சாகப் பயன்படுத்தினால் தோலில் உள்ள இறந்த செல்கள் அகற்றப்பட்டு முகம் புத்துணர்வு பெறும். தோலின் மேற்பகுதியை மென்மையாக்க உதவுகிறது.

இது தோல் நொய்களைக் குறைக்க உதவுவதாக ஆராய்ச்சி முடிவுகள் தெரிவிக்கின்றன.

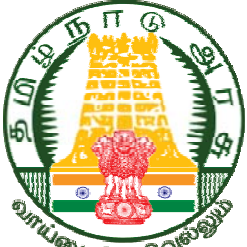
தெரியுமா?

மசூர் பருப்பை அதிகம் உற்பத்தி செய்யும் நாடு கனடா.

மசூர் பருப்பு ஆங்கிலத்தில்: Red Lentil / Masoor Dal

தாவரவியல் பெயர்: Lens culinaris

Courtesy: ஆதி வள்ளியப்பன், தி இந்து, 03.09.2016



வருவாய் நிர்வாகம்(ம) பேரிடர் மேலாண்மைதுறை வெப்பத்தாக்கம் (HEAT STROKES)

நடப்பாண்டு கோடை காலத்தில் வழக்கமான வெப்ப நிலையைவிட 5°C கூடுதல் ஆக வெயிலின் தாக்கம் இருக்கும் என இந்திய வானிலை மையம் தெரிவித்துள்ளது. எனவே வெயில் காலத்தில் மக்கள் கீழ்க்கண்ட ஆலோசனைகளை கடைபிடித்து வெயிலின் தாக்கத்திலிருந்து தங்களை தற்காத்துக் கொள்ளுமாறு கேட்டுக் கொள்ளப்படுகிறார்கள்.

செய்ய வேண்டியவை

- தாகம் இல்லாவிடினும், அவ்வப்போது போதுமான குடிநீரை அருந்த வேண்டும்.
- லேசான ஆடைகள், வெளிரிய ஆடைகள், உடலை இறுக்கி பிடிக்காத தளர்வான முழுக்கை ஆடைகள், பருத்தி நூல் துணி ஆடைகளை அணிதல் வேண்டும்.
- வீட்டின் ஜன்னல், கதவுகளுக்கு திரைச்சீலை அமைத்திருப்பின் பகல் நேரங்களில் அவற்றை மூடிய நிலையிலும், இரவு நேரங்களில் அவற்றை விலக்கி வைத்து வீட்டினை குளுமையாக இருக்கும் வகையில் பராமரித்துக் கொள்ள வேண்டும்.
- மின்விசிறி பயன்படுத்தியும் மற்றும் குளிர்ந்த நீரில் அடிக்கடி குளித்தும் உடல் வெப்பத்தை குறைத்திட கேட்டுக் கொள்ளப்படுகிறது.
- வெளியில் செல்லும்போது குடை அல்லது தொப்பி, காலணி அணிந்து கொள்ளவேண்டும்.
- இளநீர், நுங்கு, தர்ப்பூசணி, மோர் போன்றவற்றை அதிகமாக உட்கொள்ள

வேண்டும். வீட்டில் செய்யப்பட்ட லஸ்ஸி, சாத நீர், எலுமிச்சைச்சாறு, மோர், ஓ.ஆர்.எஸ் எனப்படும் உப்புசர்க்கரை கரைசல், உப்பு கலந்த கஞ்சி, பழரசங்கள் போன்றவைகளை பருகவும் கேட்டுக் கொள்ளப்படுகிறது.

- வெளியில் பயணம் மேற்கொள்ளும்போது உடன் குடிநீர் கொண்டு செல்ல வேண்டும்.
- கால்நடை மற்றும் வளர்ப்பு பிராணிகளை நிழலான இடத்தில் கட்டி வைத்து அதற்கு தேவையான குடிநீர் தீவனம் அளிக்க வேண்டும்.

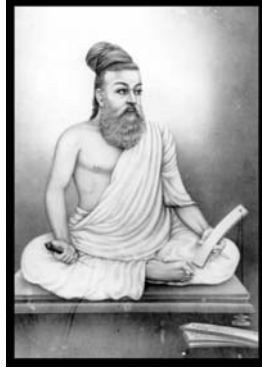
செய்யக்கூடாதவை

- நண்பகல் 12.00 மணி முதல் 3.00 மணிவரை வெளியில் செல்வதை தவிர்க்க வேண்டும்.
- மது, தேனீர், காபி போன்றவற்றை அருந்துவதை தவிர்க்க வேண்டும்.
- அதிக புரதம் / மாமிச கொழுப்பு சத்துள்ள மற்றும் கார வகைகளை தவிர்க்க வேண்டும்.
- சர்க்கரை நோய், இருதய நோய் போன்ற நாள்பட்ட நோய்களால் பாதிக்கப்பட்டவர்கள் வெயிலில் செல்வதை தவிர்க்க வேண்டும்.
- குழந்தைகளையும், வளர்ப்பு பிராணிகளையும் கதவுகள் பூட்டப்பட்ட வாகனங்களில் தனியாக அமர்ந்திருக்க அனுமதிக்க வேண்டாம் என கேட்டுக் கொள்ளப்படுகிறது. தேவைப்பட்டால் சாக்குப் பைகளை நனைத்து விலங்கினங்களின் மீது போர்த்த வேண்டும்.

மாவட்ட ஆட்சியர் துணை இயக்குனர்
திருவள்ளூர் மாவட்டம் சுகாதாரப் பணிகள்
திருவள்ளூர் மாவட்டம்

TIRUKKURAL AND MANAGEMENT IN A 'NUTSHELL' - 61

When we think of Modern Management, we can not but think of PETER DRUCKER who indeed is one of the earliest and most powerful contributors. His Books and thoughts are 'Prophetic' and they certainly sound very relevant any day. Tiruvalluvar is one of the Greatest with his 'Tirukkural' which comprehensively deals with all aspects of individual and community life including Economy and Management and Tirukkural has remained universally relevant for over 2000 years and will continue to be so for all times.



Peter Drucker sums up all the jobs of Managers as;
Management of Economic Performance of Business,
Managing the Managers and
Managing the Work and the Workers.

Management of Economic Performance of Business will start from identification of an Attractive Business Proposition, Building Competitiveness to meet the requirements, employing resources optimally and ensuring adequate returns.

Tiruvalluvar deals with Management and Leadership concepts in the context of a Kingdom, which can be

interpreted and employed beautifully for Business Kingdoms.

In the context of a Kingdom and its welfare and economic prosperity, Tiruvalluvar spells out 4 important activities as follows, which can be co related with economic activity and performance;

"Iyatral" – Identify and create a suitable economic activity

"Eettal" - Ensure earnings

Kaaththal" – Ensure proper accounting and measurements

Kaththavaguthal" – Ensure Distribution and Investments.

These four activities can ensure Prosperity and sustainability and adequate capabilities are essential for both the Kingdom and the Business Kingdom.

The Kural is as under;

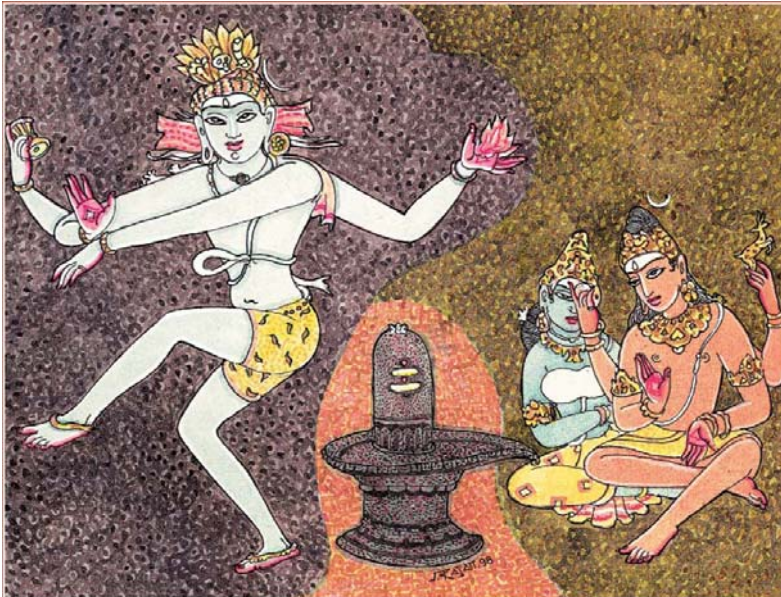
**Eyatralum Eettalum Kaaththalum Kaaththa
Vaguththalum Vallathu Arasu Kural 385**

இயற்றலும் ஈட்டலும் காத்தலும் காத்த
வகுத்தலும் வல்லது அரசு குறள் 385

"The 'Head' shall know how to develop the resources of his kingdom and how to enrich the treasury: how to preserve the wealth and how to spend it worthily."

HOME FESTIVALS - 6

ஆனி - Aani (June/July)



This is the one month of the year when there are no home festivals - coinciding not uncoincidentally with an intense month of agricultural effort. However, during Aani, major temple festivals are held for Lord Siva as Nataraja, King of Dance (left), and for Siva and Parvati.

(To be continued)



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