ELECTRICAL INSTALLATION ENGINEER

NEWS LETTER

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EDITORIAL

Dear Members, Fellow Professionals and Friends,

Seasons Greetings To One And All!

Greetings For A Happy Ayudha Pooja Day!!

October is a very special month with lot of occasions and celebrations to reaffirm our faith and commitments to Fair and Ethical practices, both in personal and professional life for contributing our best to the Nation and to the Society at large. We have a large and responsible role to play in the present and fast progressing world with dependence on Safe, Quality, Reliable and uninterrupted Energy availability all the time with adherence to Global Standards and concern for the Environment as well.

Mahathma Gandhi, the Father of the Nation, was a personification of "Sathya" and "Dharma" showing to the World through his own life and practice that great achievements are possible through ethical and fair means. Let us all reaffirm our faith in good and fair practices on his Jayanthi Day coming on the 2nd of October. This kind of approach leading to a "Win" "Win" situation has become all the more relevant today to sustain, with knowledgeable customers, increasing competition, galloping technologies and so on.

"Work is Worship" is a faith all over the world and we, in our country have extended it further to worship our machines, tools and tackles on the Ayudha Pooja day, coming this month on the 19th. It is really interesting to see that all the people without any exception celebrate this occasion in a grand manner with devotion and gaiety.

World Habitat Day is observed every year on the first Monday of October throughout the world and it falls on 1st of October this year. It was officially designated by the United Nations and the purpose of the day is to reflect on the state of our cities and towns and the basic human right to adequate shelter. It also aims to remind the world of its collective responsibility for the habitat of future generations. This year's theme is **"Municipal Solid Waste Management"** with the main global observance taking place in Kenya. Landfill and composting are some of the solutions, but presently in the world at large, technologies are successfully developed and employed for converting **"Waste to Energy"** with generation of Electrical Energy. Studies have shown increase of **'Calorific Values'** of these wastes due to growth of civilization, which makes it viable for Energy Generation. Environmental concerns of pollution etc have been overcome with development of adequate technologies duly tested. India really has a huge potential in this area with adoption of suitable technologies and adoption of a suitable **'Public Private Participation'** (PPP) model.

World Standards Day is celebrated internationally each year on 14 October. The day honours the efforts of the thousands of experts who develop voluntary standards within standards development organizations such as the International Electrotechnical Commission (IEC), International Organization for Standardization (ISO), International Telecommunication Union (ITU), Institute of Electrical and Electronics Engineers (IEEE) and Internet Engineering Task Force(IETF) and in India the BIS (Bureau of Indian Standards) . The aim of World Standards Day is to raise awareness among regulators, industry and consumers as to the importance of standardization to the global economy.

We thank all those members who have helped us by participating in the advertisement appearing for the issue September 2018 – Alfa Switchgear (I) Pvt. Ltd., Consul Neowatt Power Solutions Pvt. Ltd., Dehn India Pvt. Ltd., Excel Earthings, Galaxy Earthing Electrodes (P) Ltd., Power Cable Corporation., Supreme Power Equipment Pvt. Ltd., Universal Earthing Systems Pvt. Ltd.

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CONTENTS

MEMBERS DETAILS

S.No.	Company Name	District	Contact No.	License No.
211.	Suguna Powers	Coimbatore	0422-2570717, 98422 27817	EA 2719
212.	United Electricals	Coimbatore	9843290254, 9585577788	EA 3013
213.	E Green Electricals	Coimbatore	95002 50005, 75022 50005	EA 2933
214.	Excelltech Wind India Pvt. Ltd.	Coimbatore	0422-2526283, 97500 99998	EA 2687
215.	K.K. Associates	Coimbatore	9442638783, 98430 83783	EA 2423
216.	R.R. Electricals	Coimbatore	94431 44303, 98427 85678	EA 1729
217.	Safvolt Switchgear Pvt. Ltd.	Coimbatore	9843082837, 98439 98437	EA 3154
218.	SreeBalaji Power System	Coimbatore	99427 90801, 94457 40801	EA 3130
219.	Vidhya Electricals	Coimbatore	8220299991, 99528 34706	EA 2736
220.	Beacon Electric System	Coimbatore	98424 54653, 9488951717	EA 2140
221.	Sarayu Contractors and Consultants	Dindigul	0451 2461369, 9994457569	EA 1554
222.	Manis Power Tecknologiies	Erode	9486072345, 9976303760	ESA 468
223.	Nataraja Electricals	Erode	98427 53230, 98427 53232	EA 2659
224.	Premier Power Line	Erode	0424-2500983, 98427 73035	EA 2502
225.	RK Engineering and Infrastructure	Erode	9865210064,99447 39137	EA 3143

KNOW THY POWER NETWORK - 133

Let us move further. Before deep delving into the topic called "Surge Arrester", it is desirable to get some more information on surge protection or over voltage protection which plays a pivotal role in Power System Equipment Protection. This protection against over voltage surges consists of two parts (i) Macro Layer Protection and (ii) Micro Layer Protection as outlined in earlier articles. Several layers of protection are given to the power system apparatuses against lightning and switching surges. Among them are these two layers of protection.

(i) **Macro Layer Protection:** It constitutes the main protection against direct lightning strokes. It consists of Ground wires, (Masts spikes) and Spark gaps.

(ii) **Micro Layer Protection**: It consists of surge arresters that include line entrance arresters.

These are mainly employed against VFTOs, indirect lightning strokes and switching surges.

These layers of protection can be compared to the thicker, rough outer shell and soft inner shell of a coconut.

Now let us revert to surge arrester. These equipment are generally used against the over voltage surges like very fast transients indirect lightning strokes, switching surge and voltage spikes experienced by generated/motor windings. Though a number of versions of these arresters were used in performance highly non-linear metal oxide surge arresters (zinc oxide gapless / surge arresters) alone stand out; currently these are used on a wider scale; among the rest. Silicon carbide (gapped) arresters find a worthy place; but they become obsolete new. The salient point that needs to be noted while designing and selecting these arresters is its "energy withstand capability". It is because that these arresters are commonly employed against high energy switching surges, lightning strokes and very fast transient over voltages. VFTOs are generally noticed Gas insulated substations.

Through MOSA offers excellent protection against indirect lightning strokes and switching surges, it fails to provide effective protection against certain kinds of VFTOs. This enhances our curiosity about its functioning and also raises many valid questions about its protective action as a whole. These are listed as follows.

(i) How do the arresters start functioning? What really goes on inside the arrestor or what an arrester goes through, when it is exposed to lightnings, switching surges and VFTOs. The periods of these waves extend from nanoseconds to milliseconds.

(ii) Why does a MOSA feel uncomfortable and fails to "turn on" when it meets very steep fronted waves? What goes wrong with this functioning then.

(iii) Whether the presence of capacitance (both in the form of Arrester Block and Stray Capacitance and Equipment Capacitance) in the network, when these arrester exist, should be treated as a beneficial factor or an unwanted harmful entry?

(iv) At times MOSA successfully function and clears VFTOs, what are the 'X' factors responsible for these occurrences?

(v) What refinements are required to make the MOSAs to measure up to the threats of the entire over voltage spectrum except power frequency over voltages.

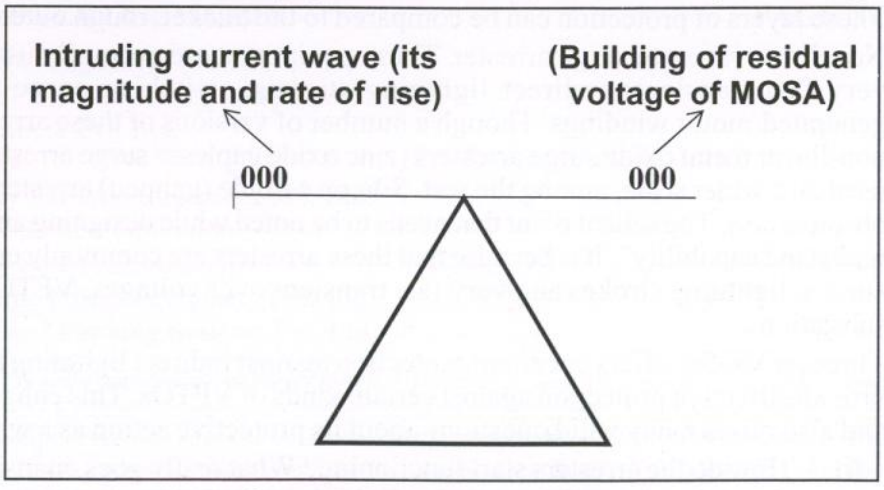
Possible answers to these questions remain with,

- The construction or fabrication of MOSAs
- The steepness and the magnitude of the incoming waves.
- Presence of the capacitance of CVTs (Capacitor Voltage Transformers), Underground Cables and other capacitor devices in the network

To respond positively to all these questions, the required replies are started with the functioning of MOSAs against the two extremes of the over voltage spectrum viz. slow speed but highly energetic switching surges to very fast moving transient over voltage waves (VFTOs)

I. Functioning of MOSA: Eye ball-to-eye ball stand off between MOSA and the intending over voltage surges.

The metal oxide surge arrester behaves like a capacitor when it is exposed to over voltage surges. As time passes on it squares upto them and starts building up its protective function instantly but in two phases – (i) a sudden shift in its working behavior followed in quick succession with its change over from non-conducting capacitor mode to conducting resistance mode. During the first or initial phase, the impingement of the invading waves brings the buildup of its discharge or residual voltage by adding the voltage developed across each grain of the arrester blocks. Then a race or see-saw battle starts between the intruding over voltage surges and the discharge voltage of the arrester. The result is delicately poised and finally goes down to the wire. Kindly note that the time gap between them viz. between the peaking time of residual voltage of the arrester and the peaking time of current of the incoming waves is in the order of a few nano-seconds (10^{-9}sec)and the end result of this race or battle determines the operation (turning on) or non-functioning of the arrester. When the arrester residual voltage leads the current waves of the imfining surges (the time difference between their peaks is negative), it wins the race and hence it starts conducting and diverts the surge energy to the earth. i.e. away from the equipment. At this time, the resistance offered by the inter granular layers of the non-linear, zinc oxide discs is abruptly reduced to a very low value and the surge current flows to the earth through the arrester elements without any impediment. Thus the arrester plunges into action instantly and safe guard the equipment from the harmful invading overvoltage waves. Hence it becomes essential to ensure the very fast transitition of the arrester from its capacitive mode to the mode to the resistance mode. When the current wave of the incoming over voltage leads the residual voltage, the arrester finds it difficult to turn-on. Then the arrester remains static or silent. Such action leads to the non-functioning of the arrester with attendant adverse impacts on the protected equipment by the harmful intruding over voltage surges.



See saw battle between MOSA and the intruding over voltage surge

II. Role of Arrester Block and Stray Capacitance and Equipment Capacitance

Arrester Block and Stray Capacitance normally operate in tandem. These two capacitance plus the equipment capacitance operate like "Speed breakers" / Speed Bumpers or Smootheners for the intruding over voltage surges and hence protect all the equipment in the power stations that come under their control or purview. This includes the outer shell of the MOSAs also. So far so good. But the block and stray capacitance has the tendency of pulling down the development of residual voltage of the MOSA. Thus it adversely impacts the protective function of MOSA, especially against VFTOs. Arrester block and stray capacitance pulls back the effective operation of MOSA. Such a measure will always make the arrester residual voltage to fall behind or lag the current wave of intruding surges. This is totally undesirable in EHV substations and GIS where stray capacitance effect is appreciably at a higher level. This is the basic reason for the touch and go operation of MOSA against certain types of VFTOs. So effective steps are needed to nullify or mitigate adverse effects brought by block and stray capacitances against arrester operation which brings impediment to its turn on. i.e. its delay its transition from its capacitance mode to its resistance mode. (Conductive mode)

In the case of switching and lightning surges, which have the front time in the order of several micro seconds, adequate time is available for the disappearance of block and stray capacitance effects and the buildup of arrester discharge or residual voltage. It self the arrester to peak before the peaking of the current wave of incoming surges i.e. the residual voltage always lead the incoming current wave i.e. time difference between them is always negative.

In the case of VFTO the delay time is in the order of a few nano seconds. Further retarding effect of arrester block and stray capacitance is widely noticed in EHV power stations and substations. Now the arrester operation is defined by the magnitude and steepness of the incoming waves, the ability of zinc oxide discs to escape from the clutches of block and stray capacitances the build up of the required arrester residual voltage well in time and the adverse effects of block and stray capacitances present in the circuit-To delay the operation of the arrester.

To sum up MOSAs have the inherent capability to attain peak of their discharge voltage well ahead of the peak of the current waves of the invading slow fronted switching surges and compactively higher fronted lightning surges. Thus MOSA effectively operate against all kinds of indirect lightning strokes and switching surges. Only when it faces VFTOs certain problem creep in. Then it finds it difficult to peak its discharge voltage well before the peak of the incoming current surges and as a consequence it fails to turn on under these types of VFTOs. When it encounters high magnitude very fast fronted current surges the barriers obstacles produced by block and stray capacitance are neutered and it successfully functions. Only in the case of low magnitude current waves of VFTOs it fails to turn on. By adoption of certain measures like genetically modified zinc oxide arresters, a mix of surge arrester and capacitive equipment in the network, now MOSAs are made to work under this type of VFTO also. All these make MOSA to function excellently against the entire spectrum of over voltage surges starting from switching surges to VFTOs.

Now in alignment with the basic concept of MOSA operation, the definitions of a few related terms are given below for reference.

(i) **Arrester Residual Voltage:** These are the voltagewave forms that appear across the arrester terminals when the arrester is exposed to over voltage surges like switching surges, lightning and VFTOs. Its peak value is crucial for arrester operation.

(ii) **Conduction Time:** It is the time taken to clamp the voltage across each grain of arrester block. It is the time taken by the arrester discharge / residual voltage to build up its peak value.

(iii) **Delay Time:** It is the time difference between the peaks of the arrester discharge voltage and the incoming current surge. If it is positive, there will be a delay in the response of the arrester and it signals the functional failure of the arrester.

Let me sign off here.

In the next article it is proposed to deal with "Switching surges". Kindly stay tuned till then.

(To be continued...)

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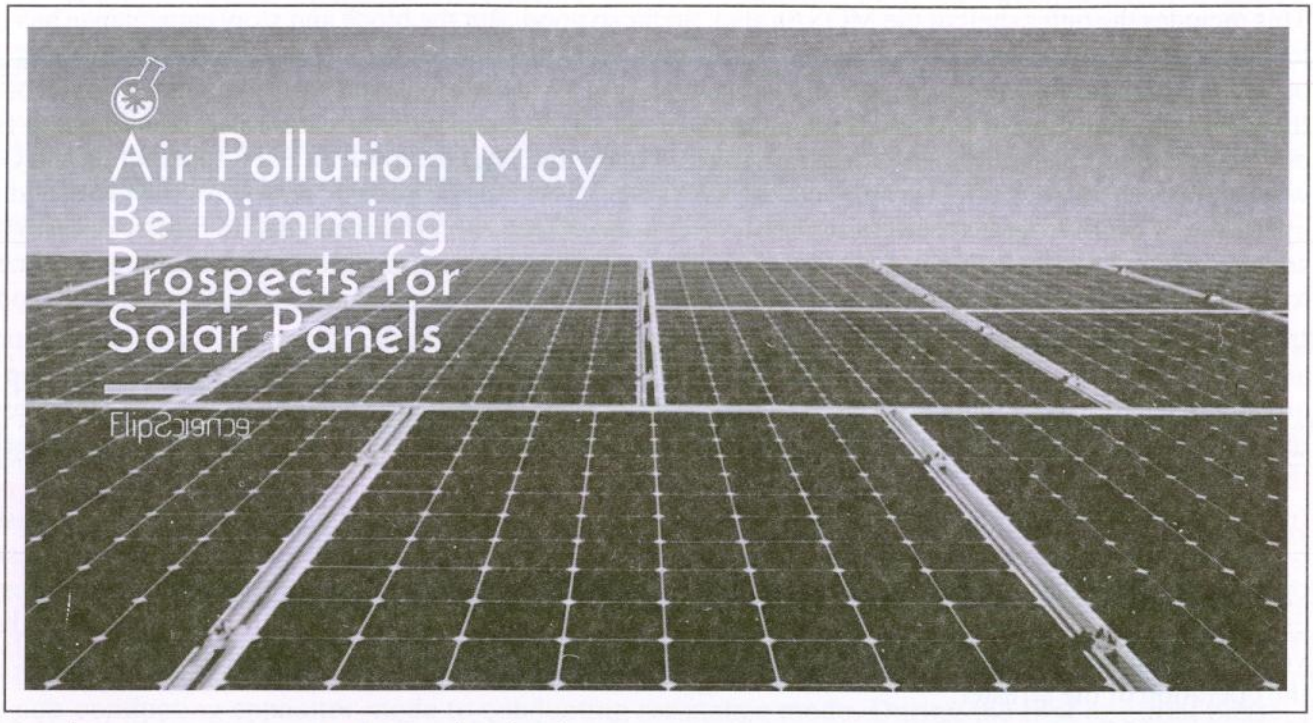
AIR POLLUTION CAN PUT A DENT IN SOLAR POWER

Study finds lost revenue can be millions of dollars annually, suggests ways to quantify haze-related reductions in solar panel output.



Ian Marius Peters, now an MIT research scientist, was working on solar energy research in Singapore in 2013 when he encountered an extraordinary cloud of pollution. The city was suddenly engulfed in a foul-smelling cloud of haze so thick that from one side of a street you couldn't see the buildings on the other side, and the air had the acrid smell of burning. The event, triggered by forest fires in Indonesia and concentrated by unusual wind patterns, lasted two weeks, quickly causing stores to run out of face masks as citizens snapped them up to aid their breathing.

While others were addressing the public health issues of the thick air pollution, Peters' co-worker Andre Nobre from Cleantech Energy Corp., whose field is also solar energy, wondered about what impact such hazes might have on the output of solar panels in the area. That led to a years-long project to try to quantify just how urban-based solar installations are affected by hazes, which tend to be concentrated in dense cities.

Now, the results of that research have just been published in the journal Energy & Environmental Science, and the findings show that these effects are indeed substantial. In some cases it can mean the difference between a successful solar power installation and one that ends up failing to meet expected production levels — and possibly operates at a loss.

After initially collecting data on both the amount of solar radiation reaching the ground, and the amount of particulate matter in the air as measured by other instruments, Peters worked with MIT associate professor of mechanical engineering TonioBuonassisi and three others to find a way to calculate the amount of sunlight that was being absorbed or scattered by haze before reaching the solar panels. Finding the necessary data to determine that level of absorption proved to be surprisingly difficult.

Eventually, they were able to collect data in Delhi, India, providing measures of insolation and of pollution over a two-year period — and confirmed significant reductions in the solar-panel output. But unlike Singapore, what they found was that "in Delhi it's constant. There's never a day without pollution," Peters says. There, they found the annual average level of attenuation of the solar panel output was about 12 percent.

While that might not sound like such a large amount, Peters points out that it is larger than the profit margins for some solar installations, and thus could literally be enough to make the difference between a successful project and one that fails — not only impacting that project, but also potentially causing a ripple effect by deterring others from investing in solar projects. If the size of an installation is based on expected levels of sunlight

reaching the ground in that area, without considering the effects of haze, it will instead fall short of meeting its intended output and its expected revenues.

"When you're doing project planning, if you haven't considered air pollution, you're going to undersize, and get a wrong estimate of your return on investment," Peters says

After their detailed Delhi study, the team examined preliminary data from 16 other cities around the world, and found impacts ranging from 2 percent for Singapore to over 9 percent for Beijing, Dakha, Ulan Bator, and Kolkata. In addition, they looked at how the different types of solar cells — gallium arsenide, cadmium telluride, and perovskite — are affected by the hazes, because of their different spectral responses. All of them were affected even more strongly than the standard silicon panels they initially studied, with perovskite, a highly promising newer solar cell material, being affected the most (with over 17 percent attenuation in Delhi).

Many countries around the world have been moving toward greater installation of urban solar panels, with India aiming for 40 gigawatts (GW) of rooftop solar installations, while China already has 22 GW of them. Most of these are in urban areas. So the impact of these reductions in output could be quite severe, the researchers say.

In Delhi alone, the lost revenue from power generation could amount to as much as $20 million annually; for Kolkata about $16 million; and for Beijing and Shanghai it's about $10 million annually each, the team estimates. Planned installations in Los Angeles could lose between $6 million and $9 million.

Overall, they project, the potential losses "could easily amount to hundreds of millions, if not billions of dollars annually." And if systems are under-designed because of a failure to take hazes into account, that could also affect overall system reliability, they say.

Peters says that the major health benefits related to reducing levels of air pollution should be motivation enough for nations to take strong measures, but this study "hopefully is another small piece of showing that we really should improve air quality in cities, and showing that it really matters."

The research team also included S. Karthik of Cleantech Energy Corp. in Singapore, and Haohui L. of the National University of Singapore. The work was supported by Singapore's National Research Foundation through the Singapore-MIT Alliance for Research and Technology and by the U.S. Department of Energy and National Science Foundation.

AUSTRALIA'S FIRST COMMERCIAL INSTALLATION OF PRINTED SOLAR CELLS

Australia's first commercial installation of printed solar cells, made using specialised semiconducting inks and printed using a conventional reel-to-reel printer, has been installed on a factory roof in Newcastle.

The 200 square metrearray was installed in just one day by a team of five people. No other energy solution is as lightweight, as quick to manufacture, or as easy to install on this scale.

Our research team manufactured the solar modules using standard printing techniques; in fact, the machine that we use typically makes wine labels. Each solar cell consists of several individual layers printed on top of each other, which are then connected in series to form a bank of cells. These cells are then connected in parallel to form a solar module.

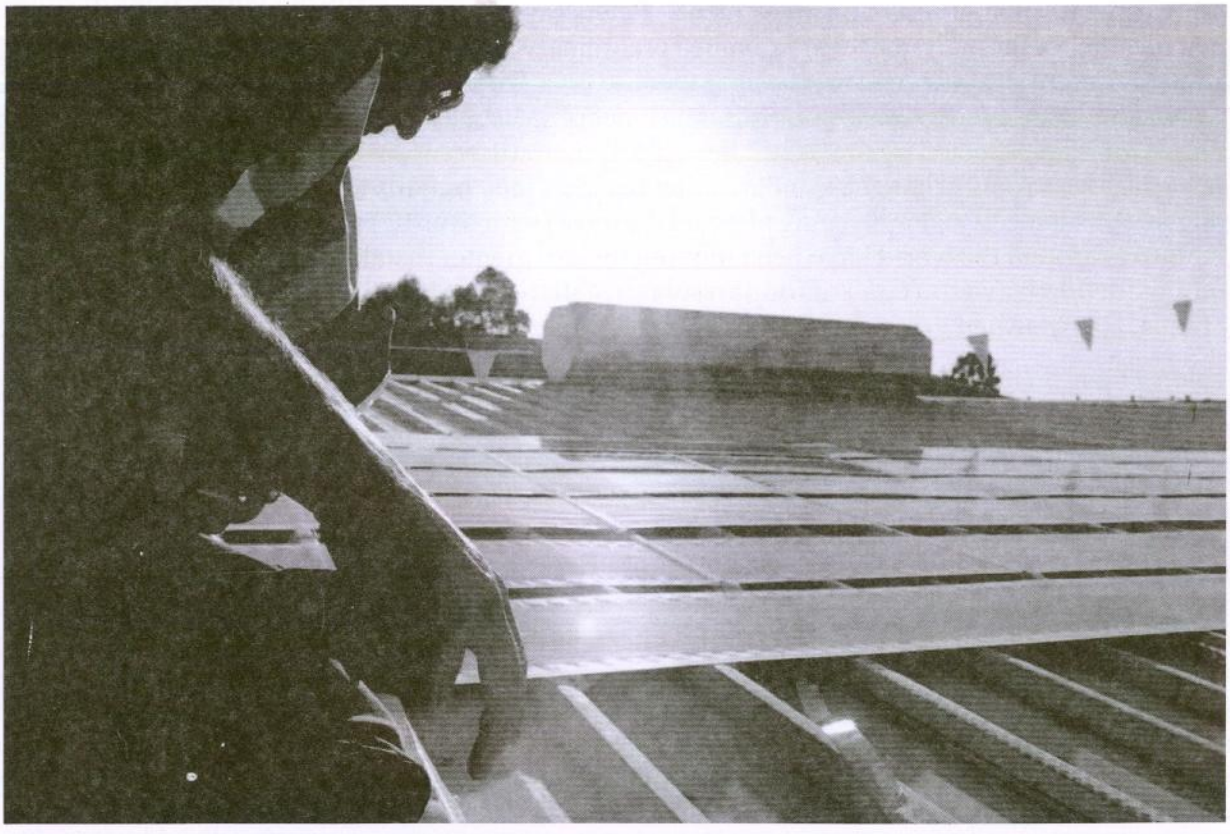
Since 1996, we have progressed from making tiny, millimetre-sized solar cells to the first commercial installation. In the latest installation each module is ten metres long and sandwiched between two layers of recyclable plastic.

At the core of the technology are the specialised semiconducting polymer-based inks that we have developed. This group of materials has fundamentally altered our ability to build electronic devices; replacing hard, rigid, glass-like materials such as silicon with flexible inks and paints that can be printed or coated over vast areas at extremely low cost.

As a result, these modules cost less than A$10 per square metre when manufactured at scale. This means it would take only 2-3 years to become cost-competitive with other technologies, even at efficiencies of only 2-3%.

These printed solar modules could conceivably be installed onto any roof or structure using simple adhesive tape and connected to wires using simple press-studs. The new installation at Newcastle is an important milestone

on the path towards commercialisation of the technology – we will spend the next six months testing its performance and durability before removing and recycling the materials.



We think this technology has enormous potential. Obviously our technology is still at the trial stage, but our vision is a world in which every building in every city in every country has printed solar cells generating low-cost sustainable energy for everyone. This latest installation has brought the goal of solar roofs, walls and windows a step closer.

Ultimately, we imagine that these solar cells could even benefit those people who don't own or have access to roof space. People who live in apartment complexes, for example, could potentially sign up to a plan that lets them pay to access the power generated by cells installed by the building's owner or body corporate, and need never necessarily "own" the infrastructure outright.

FINDING HAPPINESS

Once a group of 50 people was attending a seminar

Suddenly the speaker stopped and started giving each person a balloon. Each one was asked to write his/her name on it using a marker pen. Then all the balloons were collected and put in another room.

Now these delegates were let in that room and asked to find the balloon which had their name written, within 5 minutes.

Everyone was frantically searching for their name, pushing, colliding with each other, and there was utter chaos.

At the end of 5 minutes, no one could find their own balloon.

Now each one was asked to randomly collect a balloon and give it to the person whose name was written on it. Within minutes everyone had their own balloon.

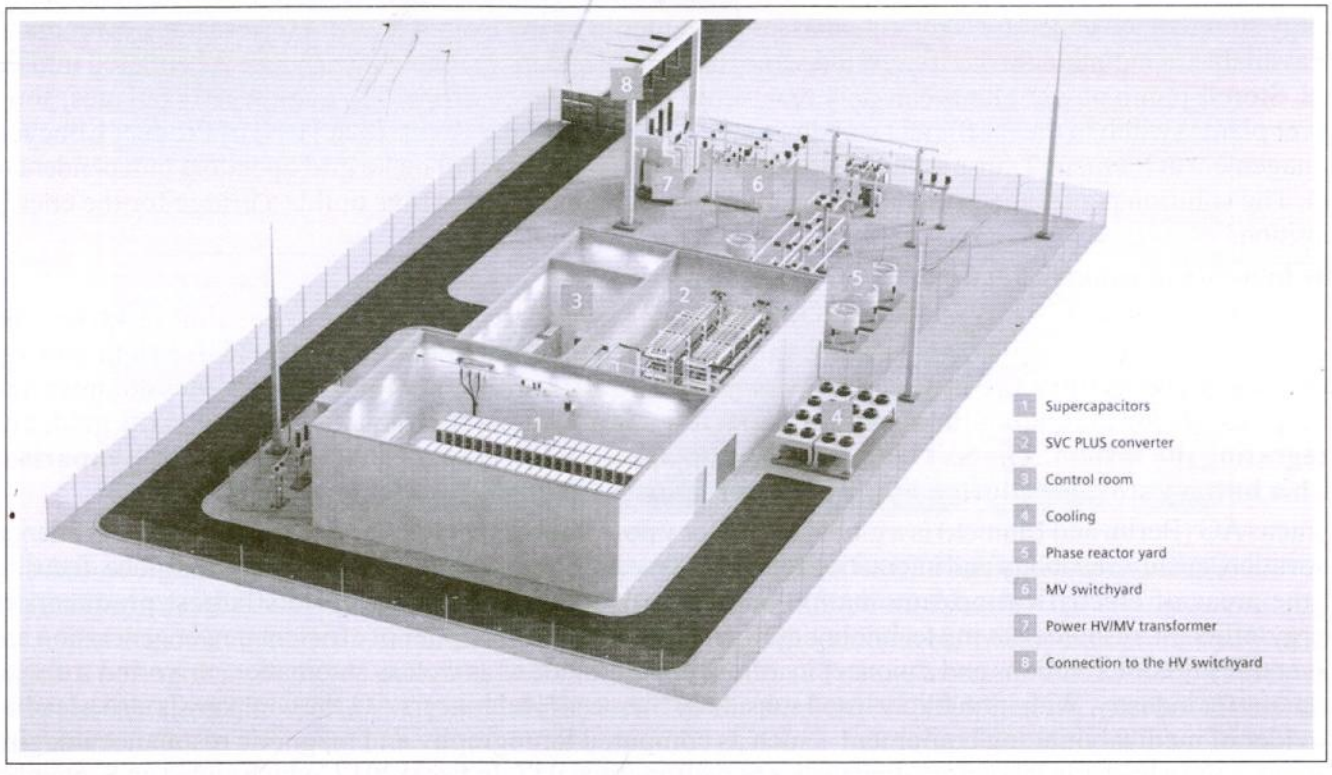
The speaker began: This is exactly happening in our lives. Everyone is frantically looking for happiness all around, not knowing where it is. Our happiness lies in the happiness of other people. Give them their happiness; you will get your own happiness.

And this is the purpose of human life.

Author Unknown

SIEMENS LAUNCHES FREQUENCY STABILIZER TO SUPPORT POWER GRIDS IN MILLISECONDS

Siemens is launching the innovative Frequency Stabilizer SVC Plus FS. It combines static VAR compensation with so-called supercapacitors for the first time.



The SVC Plus FS can compensate for voltage and frequency fluctuations in just milliseconds.The space-saving solution fills an important technological gap to facilitate the energy transition.With its SVC Plus Frequency Stabilizer (FS), Siemens is the world's first supplier to combine reactive power compensation capability with the use of so-called supercapacitors. The SVC Plus FS can feed the reactive power needed for stable grid operation in less than 50 milliseconds. At the same time, up to 200 megawatts of electric power stored in the supercapacitors can be transferred to the grid at full load. As a result, the voltage and frequency, and thus also the grid, remain stable. This automatic procedure is triggered whenever the voltage or frequency exceeds or drops below certain limits. When fluctuations occur in a power grid, the first few seconds determine whether a blackout will occur. In such situations, a new solution developed by Siemens immediately supplies the energy needed in the necessary quantity, thus preventing a power failure. This is particularly important in power grids that are exposed to volatile infeeds, for example from increasingly more distributed and renewable energy sources.

The missing link in the energy transition

Depending on the country, the frequency of an AC grid remains at a constant 50 Hertz (in Europe, for example) or 60 Hertz (in North America, for instance) when the quantity of electricity generated and consumed is in balance. Renewable energy, however, is only available in variable quantities, depending on the sun and wind. More and more producers are feeding power locally; the distances between the power generation site – on the open ocean, for example – and the main points of consumption inland often amount to hundreds of kilometers. If a large consumer is then added or removed, the frequency in the grid, begins to fluctuate. An underfrequency occurs, for example, if the load abruptly increases or power plant capacity is suddenly absent. **"In the near future, power management systems alone will no longer be able to compensate for imbalances in power grids,"** says MirkoDuesel, CEO Transmission Solutions at Energy Management. **"The innovative**

and economical SVC Plus FS solution is the missing link that can ensure the grid stability we all need in this era of transition to a new energy mix."

Greater inertia and more robust grids

Large conventional power plants have long played a key role in maintaining a power balance. With fossil fuels, the power can be increased and decreased as needed. The kinetic energy stored in the flywheels of generators, for example, can quickly equalize small deviations. The grid is in balance again within seconds. Experts call the energy stored in the generator's rotating masses "grid inertia." However, fewer and fewer large power plants are available to maintain the inertia. At the same time, more and more renewable energy is being fed into the grid. Stored-pump power plants can only react slowly to frequency drops. "To avoid costly outages, some power plants switch to the inefficient standby mode," says Alexander Rentschler, Head of Product Lifecycle Management at Siemens Transmission Solutions. "The SVC Plus FS will make grid operators independent of this. The solution makes the grid more robust, increases its inertia, and thus builds a bridge for the energy transition."

The benefits of supercapacitors

Supercapacitors store energy. Their charging mode is electrostatic, which means that electrons are moved instead of molecules. As a result, they are charged and discharged much faster than storage batteries. Siemens buys the supercapacitors from its Californian partner Maxwell Technologies and is responsible for managing the static var capacitors and supercapacitors, connecting to the grid, and integrating the system. The SVC Plus FS takes up approximately two-thirds less space in comparison with a battery storage solution at the reference power of 50 Megawatt.

Siemens AG (Berlin and Munich) is a global technology powerhouse that has stood for engineering excellence, innovation, quality, reliability and internationality for 170 years. The company is active around the globe, focusing on the areas of electrification, automation and digitalization. One of the world's largest producers of energy-efficient, resource-saving technologies, Siemens is a leading supplier of efficient power generation and power transmission solutions and a pioneer in infrastructure solutions as well as automation, drive and software solutions for industry. With its publicly listed subsidiary Siemens Healthineers AG, the company is also a leading provider of medical imaging equipment – such as computed tomography and magnetic resonance imaging systems – and a leader in laboratory diagnostics as well as clinical IT. In fiscal 2017, which ended on September 30, 2017, Siemens generated revenue of €83.0 billion and net income of €6.2 billion. At the end of September 2017, the company had around 377,000 employees worldwide.

Further information is available on the Internet at www.siemens.com.

TATA POWER DOES WORLD'S LARGEST SOLAR ROOFTOP INSTALLATION ON A CRICKET STADIUM, AT CRICKET CLUB OF INDIA, MUMBAI THROUGH ITS SOLAR ARM

820.8kWp Solar Rooftop System

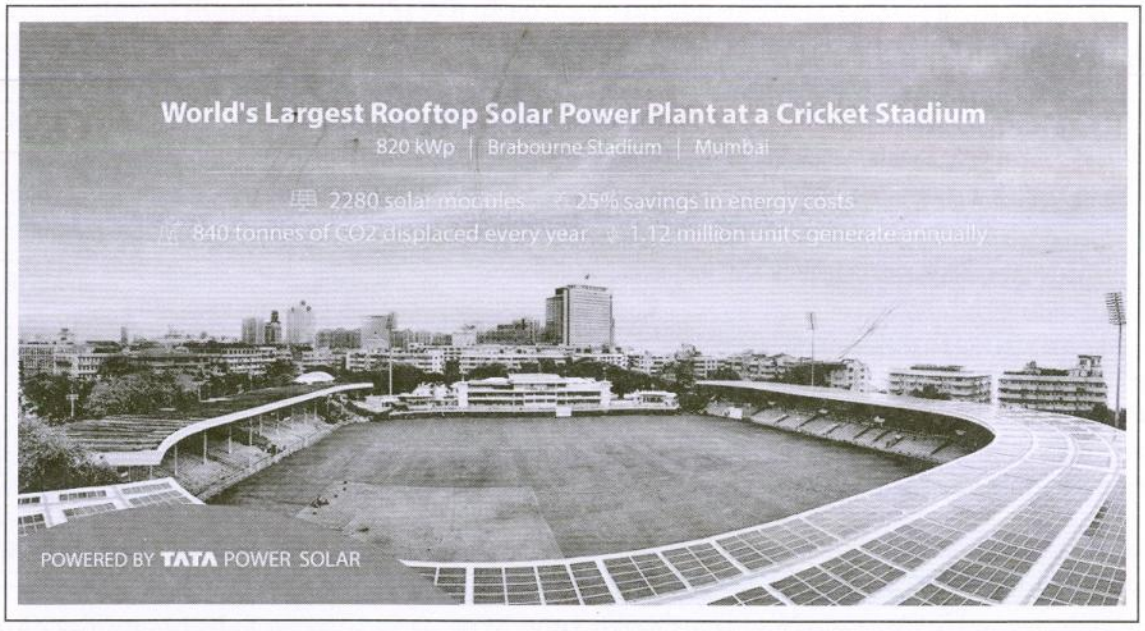
CCI stadium in Mumbai Goes Green

Estimated generation 1.12 million units per annum

Offset 840 tonnes of carbon annually

Tata Power Solar, India's largest integrated solar company and Tata Power's wholly-owned subsidiary, has commissioned 820.8kWp at Cricket Club of India, Mumbai. The project was executed by Tata Power Solar to provide solar rooftop solution for the stadium located at Mumbai and was completed in 100 days. Shri Devendra Fadnavis, Honourable Chief Minister of Maharashtra did the inauguration of the stadium. Tata Power Solar joined hands with Cricket Club of India to utilise the potential of solar energy. The installation of the solar rooftop project will help to generate over 1.12 million electricity per year which will lead to 25% of savings in the power consumption cost. At present on an average (apart from Stadium Flood lights, which runs on DG), the stadium consumes 4 lakhs kWh /month, but with solar installation, on an average basis the consumption from the grid would fall to approx. 3 lakhs kWh/month. CCI will also be able to curb the emission of over 840 tonnes of carbon dioxide annually.

Mr. Praveer Sinha, MD & CEO, Tata Power, said, "We are delighted to partner with Cricket Club of India on the World's largest solar powered cricket stadium in Mumbai. We continuously seek to move ahead in our renewable and sustainability objectives."



With an aim to be environmentally responsible by reducing its carbon footprint, Cricket Club of India initiated a project to install 820.8kWp roof mounted solar plant at the CCI stadium, Mumbai.

Mr. AshishKhanna, President, Tata Power (Renewables), said in a statement, "After executing The World's largest Rooftop in a single location and India's largest carport at Cochin International Airport, Tata Power Solar has installed The World's largest Rooftop in a Cricket Stadium at CCI Mumbai, in a record period of 100 days."

Speaking on the occasion, Mr. PremalUdani, President, CCI and Mr. Rakesh Kapoor, Vice Chairman of Infrastructure and Green Technology Committee, CCI said, "We continuously look at projects which promote renewable energy focus, and are glad to partner with Tata Power Solar to execute this landmark project for us. They have delivered on the promise of the brand TATA. We have set an example to use rooftop space in the stadiums to help protect the environment."

Tata Power Solar has commissioned more than 1.45 GW of ground-mount utility scale and over 220 MW of rooftop and distributed generation projects across the country till date. Tata Power Solar has been ranked #1 EPC rooftop solar player consistently for four years by BRIDGE TO INDIA, a leading cleantech consulting and knowledge services provider. The total installed capacity in the rooftop segment is over 220 MW as of 31st March 2018 including commercial, residential & industrial sector.

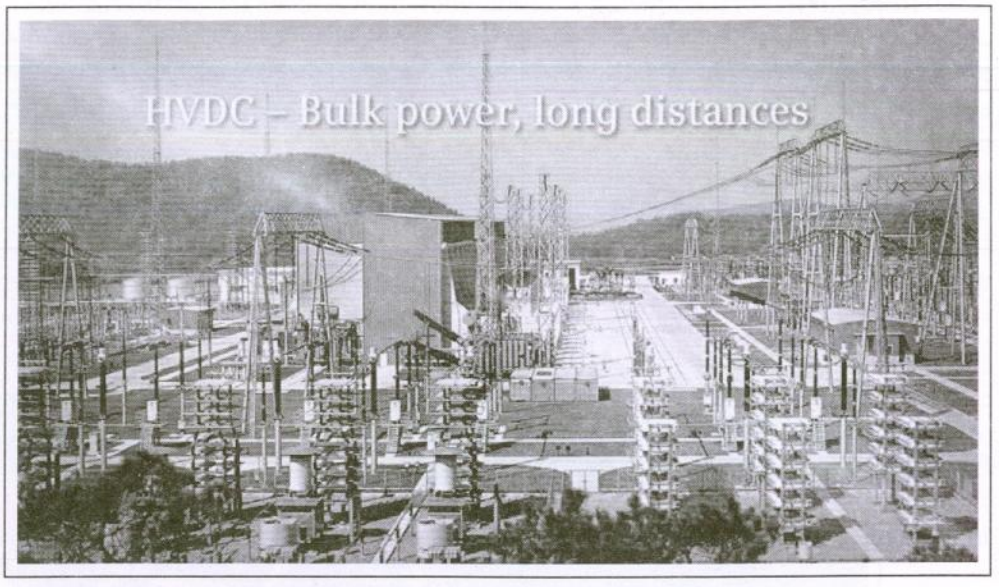
About Tata Power Solar:

Tata Power Solar, with 29 years of deep domain expertise, is one of the pioneering solar manufacturers in the world and India's largest specialised EPC player. Founded in 1989, the company was originally formed as a joint venture between Tata Power and British Petroleum Solar (BP Solar). As a pioneer and market leader in the solar space, headquartered in Bangalore, Tata Power Solar now operates independently as a wholly owned subsidiary of Tata Power.

As one of the largest solar manufacturers in India, Tata Power Solar operates world-class manufacturing unit in Bangalore, with a production capacity of 400 MW of modules and 300 MW of cells. It has completed more than 1.45GW of ground-mount utility scale and over 220MW of rooftop and distributed generation projects across the country till date. It also offers a diverse line of solar solutions for both urban and rural markets – these include rooftop solutions, solar pumps and power packs among others. Tata Power Solar is committed to enabling solar everywhere and aims to provide energy access to millions of people across the country via its integrated solar solutions.

For more information visit: www.tatapowersolar.com

SIEMENS HAS COMMISSIONED HVDC BACK-TO-BACK LINK BETWEEN INDIA AND BANGLADESH



In June 2018, Siemens has fully commissioned the second block of the high voltage direct-current (HVDC) back-to-back link in Bheramara, Bangladesh, to connect the electricity supply networks of India and Bangladesh with a transmission capacity of up to 500 Megawatts (MW). Block 1 is in operation since 2013 and offers a transmission capacity of up to 500 MW. With block 1 & 2 operating in parallel the Bheramara HVDC back-to-back link has a capacity of up to 1000 MW – the highest reliable power capacity in Bangladesh. On July 27th, 2018, the trial run was successfully completed; however, Block 2 has been put into commercial operation since July 2nd, 2018, to support the customer's operating needs. From Bheramara at the Western border of Bangladesh, the 230-kilovolt (kV) grid of the country will be connected via a substation and overhead lines to India's 400-kV grid.

"The availability of reliable power transmission is crucial for emerging countries like Bangladesh. Therefore, we're especially pleased to hand over Block 2 of the Bheramara HVDC back-to-back link to PGCB," states MirkoDüsel, CEO Transmission Solutions at Energy Management. "After only 24 months project execution time and 3 Million safe working hours at site the link will help Bangladesh to reliably import the annually needed additional electricity of 500 MW from India. The HVDC link enables a constant, affordable and reliable power supply for the people and economy in Bangladesh and helps consolidating the grid stability of the densely populated state."

HVDC Classic for a stable electricity grid

On a turnkey basis, Siemens was responsible for engineering, installing and commissioning of the complete HVDC system consisting of two back-to-back converter stations in Bheramara. In 2013, the company already installed Block 1.

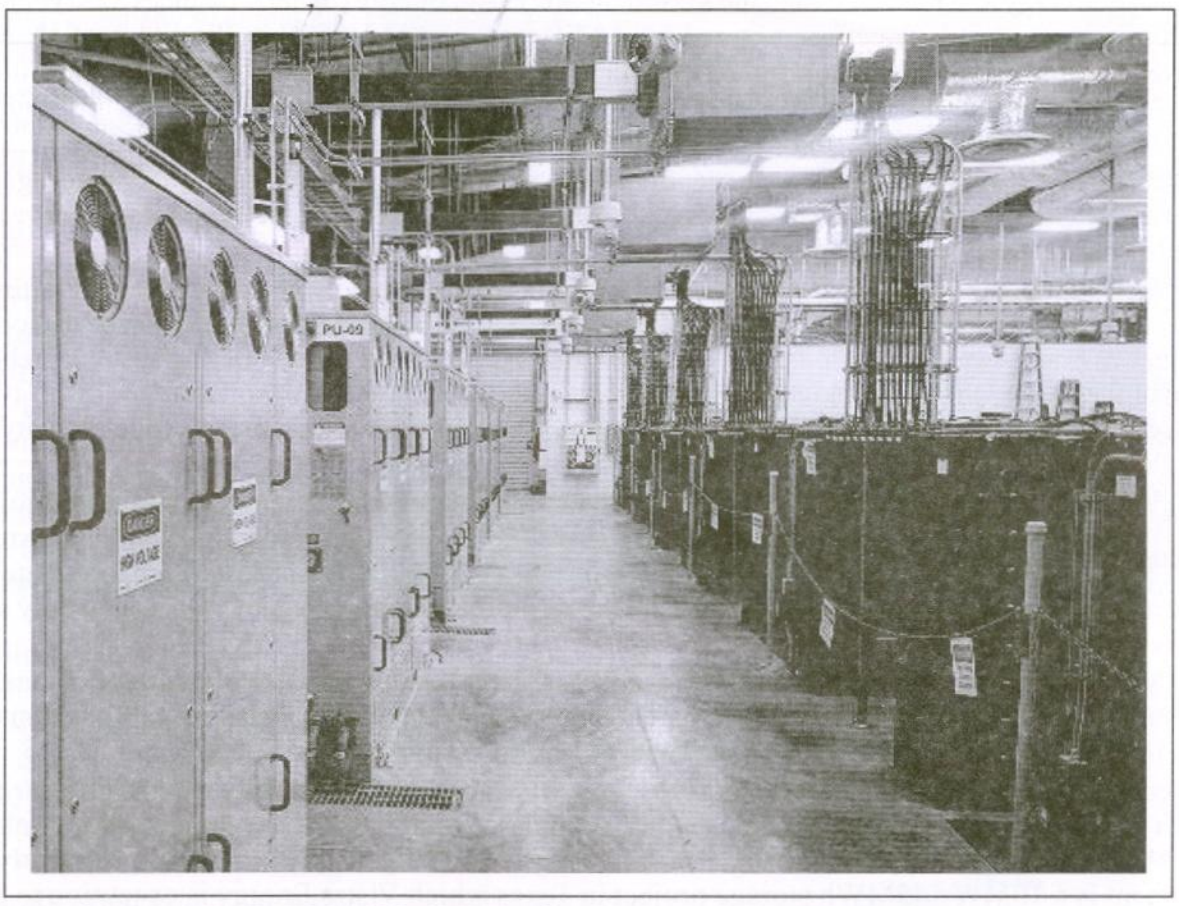
The company's scope of supply encompassed delivery of all electrical components including the control, protection and monitoring systems for the HVDC system, the thyristor valves, eight converter transformers and the AC filters. Siemens' proven HVDC Classic technology with its fast control function will contribute toward stabilization of the connected systems, which is a key benefit in the event of grid disturbances. Furthermore, this high capacity power link will help to avoid bottlenecks on the 230-kV side of Bangladesh. Siemens is a world leader in HVDC technology and has installed more than 55 projects worldwide with an overall transmission capacity of 94 GW.

What is a back-to-back HVDC link?

With a back-to-back HVDC link two independent neighbouring transmission systems with incompatible electrical frequencies, exceeding short-circuit power levels or different operating philosophies are connected. Rectifier (conversion of AC to DC) and inverter (conversion of DC to AC) are in the same converter station, known as back-to-back. HVDC links are used to enhance weak AC links by transmitting large amounts of active power and facilitating fast controllability of the power flow, especially when the existing networks have reached the limit of their short-circuit capability.

US HAS GONE PAST 1GWH OF INSTALLED BATTERY CAPACITY, WITH HELP FROM UTILITIES

US utilities deployed more than 520MWh of energy storage on their networks in 2017, bringing the country's cumulative installed capacity of grid-connected energy storage systems to over 1GWh, trade organisation Smart Electric Power Alliance (SEPA) has found.



By the end of 2017, 922.8MW / 1293.6MWh of grid-connected storage capacity was on US networks across 5,167 systems. Throughout 2017, utilities alone interconnected 216.7MW / 523.9MWh to the grid, amounting to 2,588 systems. Surveying 137 utilities, SEPA said 13.3MW / 29.3MWh of residential systems were added during the year, with 59MW / 139.7MWh of non-residential and 144.4MW / 354.9MWh of utility-supply systems.

SEPA, which considers its remit to be that of helping utilities to deploy clean and smart distributed energy solutions, publishes regular 'Top 10' lists ranking utilities in the US by the amount of solar deployed in their respective services areas, has this time out issued a 52-page report which can be found on the organisation's website. As well as including rankings of energy storage utility deployment figures, both in watts and watts-per-customer, the report features in-depth analysis of the national picture state-by-state as well as at national or federal level.

From the top-down perspective, it appears durations of storage are increasing. Overall deployments in megawatts across the US rose by 5% from 2016 to 2017, while the corresponding megawatt-hour figure rose by 104%.

Wind, demand response, solar and more continue to drive progress.

Some interesting or surprising state-by-state trends have been identified: Texas wind farms account for almost a quarter (22.2%) of all energy storage capacity deployed by utilities in 2017.

Integrated resource planning (IRP), long-term roadmaps for generation and distribution by utilities, are starting to recognise energy storage as a network asset. Tucson Electric Power of Arizona is among the utility leaders in this field and declared its aim in a 2017 IRP to connect hundreds of MWs by 2031.

HECO (Hawaii Electric Co) plans for 89MWh of energy storage by 2021 and 1,057MWh by 2045, including 104MWh of demand response energy storage to be integrated by 2021.

Washington, New Mexico, Michigan and Arizona have all instructed investor-owned utilities (IOUs) through policy to evaluate storage role against load curves etc.

Other notable state-wide programmes include: 'Policy in action' section on Massachusetts, with Advancing Commonwealth Energy Storage (ACES) "a collaborative demonstration program between the Massachusetts Department of Energy and Resources and the Massachusetts Clean Energy Center". Includes 32MW / 81MWh across 26 demonstration projects, supported by ACES issuance of US$20 million in cost-share grant funding.Solar-plus-flywheels, aggregated behind-the-meter residential systems in the hundreds, solar-plus-storage systems for commercial sites and for proving models of community ownership through solar subscription programmes.

The report from SEPA also goes into some detail around the various applications of energy storage from a technical and economic perspective as well as some of the ways batteries and other technologies have already been deployed or marketed to customers by utilities.

This includes Vermont utility Green Mountain Power's offer of Tesla Powerwall units to customers through a low-cost subscription programme, whereby the utility shares use of the batteries to help balance the local grid. Others, such as Salt River Project and Jacksonville Electric Authority have begun offering customer rebates for a portion of the cost of energy storage systems. SEPA also said new Powerwall software by Tesla, available since May, can also allow storage batteries to take advantage of utility time-of-use rates for electricity, which SEPA called a potential market catalyst.

The comprehensive report also examines front-of-meter utility applications for energy storage and how much progress has been made in each area. Energy storage as a 'non-wires alternative' (NWA) to investment in transmission and distribution infrastructure such as substations, batteries to black start grids, storage to help integrate and mitigate peaks in solar production and the recommissioning of legacy lead acid battery systems with newer technologies are all looked at.

With the solar industry also an important part of SEPA's remit there is also a deal of attention paid to the nascent solar-plus-storage utility space. The report highlights notable projects, including APS (Arizona Public Service) installing a 50MW / 135MWh battery with 65MW of solar from First Solar.

The project creates a dispatchable clean energy resource which can inject electricity into the grid during later afternoon to evening peaks from 3pm to 8pm. Other examples include a Salt River Project 20MW solar array with 10MW / 40MWh of batteries, backed with a long-term (20 year) PPA contract. Currently under development is a 10MW / 42MWh storage project in Texas which Vistra Energy is executing to capture curtailed or 'clipped' energy from a 180MW solar PV farm.

From there, SEPA moves onto a range of other topics including microgrids and "generation-agnostic storage" – in other words, while there is often an assumption that solar and storage are perfect companions, there is also a case for installing storage alongside natural gas, hydroelectric and of course wind.

UBUNTU - AFRICAN STORY

UBUNTU is a very nice story from Africa. The motivation behind the Ubuntu culture in Africa…

An Anthropologist proposed a game to the African tribal children…

He placed a basket of sweets near a tree and made the children stand 100meters away. Then announced that whoever reaches first would get all the sweets in the basket.

When he said 'ready steady go!'…

Do you know what these children did?

They all held each other's hands, ran together towards the tree, divided the sweets equally among themselves, ate the sweets and enjoyed it.

When the Anthropologist asked them why they did so.

They answered… **"Ubuntu"**.

Which meant –

'How can one be happy when the others are sad?'

Ubuntu in their language means –

"I am because we are".

A strong message for all generations.

Let all of us always have this attitude and spread happiness wherever we go.

Let's have a "Ubuntu"Life…

I AM BECAUSE WE ARE.

SUZUKI PLANNING TO BRING ELECTRIC BIKES BESIDE CARS IN INDIA BY 2020

Suzuki Motorcycle India is reportedly planning to bring electric bikes in the Indian market by 2020. Interestingly company's car making unit in India, Maruti Suzuki is also planning to launch electric car in the country during the same time frame. **It is said to be the result of last year's meeting between chairman Osamu Suzuki and Indian Prime Minister NarendraModi . Suzuki, Denso and Toshiba, has committed to investing Rs 1,700 crore in setting up a battery-making facility in Gujarat.**

According to ET Suzuki Motorcycle India has requested the headquarters in Japan for an electric scooter as well as an electric bike for the local market.

The publication notes that a project team of five people has been setup by Suzuki and has engaged KPMG to help devise electric vehicle solutions.

Suzuki Motorcycle managing director Satoshi Uchida speaking to the publication said "The cost of electric scooter is still high when compared to the conventional scooters. We are currently studying as to how we can offer an electric scooter that is accessible and addresses the range issue. We should have an electric scooter for India by 2020."

While the company's immediate priority is scooters, however, it plans to launch electric bikes as well. According to the company adoption of electrification in two-wheelers could be much faster than in other segments.

The report states that Suzuki is also looking out to options of introducing swappable batteries to address the range anxiety challenge.

USE ELECTRIC VEHICLES
SAVE COUNTRY
SAVE ENVIRONMENT

WORLD STANDARDS DAY – 14/10/2018

Some of the Benefits of Standardization are shown below as published by International Standards Organizations to support this year's theme of "My Crazy idea" for the presentation competition.

ENERGY, ELECTRICAL ENERGY AND RENEWABLE ENERGY – 13

Sustainable Growth, Sustainable Electrical Energy and Renewable Energy

Thermo Chemical and Biochemical Technologies

Bio Energy and various Gases and Energy uses

Biomass and GAS: Continued…..

Uses of Bio Gas and Economics:

Biogas – Bio Methane – Bio CNG – Automobile Fuel:

Use of Biogas as an Automobile Fuel has been found feasible with the enrichment process of cleaning the Gas and achieving higher Calorific value, This application of Biogas has great significance particularly in the light of our dependence on imported crude. It affects our 'Energy Security' as well as price stability, which we are seeing today. More importantly, it can help reduce use of 'Fossils'.

It will be interesting to read the details of a latest news item given below, about an announcement by the Government regarding use of Biogas as Automobile Fuel, before we proceed further to analyse the technologies and the processes 5,000 bio-gas plants at Rs 1.75 lakh cr investment in offing: Oil Minister DharmendraPradhan

As many as 5,000 CBG plants are envisaged to be set up in the private sector that will generate 75,000 direct employment.

NEW DELHI: Oil Minister DharmendraPradhan Monday said as many as 5,000 plants for extracting biogas from agricultural residue, cattle dung and municipal solid waste are envisaged to be set up in the country in next five years at a massive Rs 1.75 lakh crore investment.

Pradhan announced that state-owned fuel marketing companies will purchase all the bio-gas from these plants at Rs 46 per kg in a bid to cut reliance on imports for meeting oil needs.

India is more than 81 per cent dependent on imports for meeting its oil needs and the move to use biogas extracted from waste/bio-mass sources like agriculture residue, cattle dung, sugarcane press mud, municipal solid waste and sewage treatment ..plant waste is aimed at cutting that.

"We are today inviting Expression of Interest (EoI) from producers to offer compressed bio-gas (CBG) that oil companies can use as a fuel for transportation," he said at the launch event here.

CBG so offered will replace compressed natural gas (CNG) currently used in buses, cars and autos.

"The price of Rs 46 per kg that is being offered is more than the domestic natural gas price. Plus 100 per cent offtake guarantee is being offered," he said. Of the 146 million standard cubic meters per day of natural gas consumed in the country, 56 per cent is imported.

Pradhan said there is a potential to produce 62 million tonnes of CBG from wastes and its usage would lift the share of natural gas in the energy basket from current 6-7 per cent.

As many as 5,000 CBG plants are envisaged to be set up in the private sector that will generate 75,000 direct employment, he said. "This will involve an investment of Rs 1.75 lakh crore. Together, Rs 70,000 crore investment envisaged in rollout of city gas distribution (CGD) network in the 86 cities auctioned in the latest round, would take the total to Rs 2.5 lakh crore, equal to the investment in the glamourous telecom sector," he said.

The CGD networks in 86 new cities will help expand the number of CNG stations from current 1,500 to 10,000 in five years and more than double the piped natural gas connection to household kitchens to 2.5 crore, he said.

The EoI, he said, is valid till March 31, 2019 but the first CBG plant can start within this quarter.

The potential of 62 Million Tons of CBG (Compressed Bio gas) projected is very significant and feasible. Out of about 140 to 150 Million Tons of Petroleum use in the country, very largely for transportation both road and rail, the CBG plans try to replace about 40% of the Fossils and it will really be a revolution when it becomes a reality.

Enrichment and Compression of Biogas – CBG or BIO CNG

Biogas produced from the process of Bio Methanisation is a mixture of about 45 to 55% of Methane Gas, 50 to 45% of Co_2 Gas and the balance small percentage being mostly Hydrogen sulphide (H2S) etc. Energy is

actually the Methane portion and technologies are now developed to remove both CO_2 and H2S. The calorific value of raw Methane Gas is of the order of 4500 K.Cal per Kg. and the cleaned up Gas which is close to or better than Natural Gas (NG or CNG when compressed) and the Calorific value goes up to around 9000 K.Cal. per Kg. making it worthwhile and suitable for "Compressing and Bottling". The compressors and Cylinders used for CNG (The normal compression pressure used for CNG is 200 Bar which can be used for cleaned or enriched Bio Gas which is now called as Bio CNG.

A comparison of different gases, their compositions and their Calorific values can help understand the differences.

	Composition	Calorific Value
Methane	**Methane (100%)**	**9000 k Cal/cum.**
Natural gas	**Methane (95%) + Ethane, Propane, Butane.....**	**8600 k Cal/cum.**
Biogas	**Methane (~55%) + carbon dioxide (~35%) + hydrogen (~5%) + Hydrogen di-Sulphide...**	**4700 k Cal/cum.**
Producer gas	**Carbon monoxide (~ 20 %) +Hydrogen (~ 20%) + Methane(~ 2%) + Carbon dioxide (~15%) + balance Nitrogen**	**1100 kCal/ cum.**
LPG	**Mainly Butane + Isobutane + Propane**	**10880 k Cal/kg.**

Bio Gas Cleanup System:

There are a number of systems in practice in many places using Chemicals etc and one of the simple and cost effective System developed indigenously by IIT Delhi is known as "Water Scrubbing System", which can improve the Methane content of the cleaned up gas to about 95 to 98%, substantially increasing the Calorific Value.

What is shown below is a schematic diagram of Water Scrubbing System and the Compression Process of Biogas to make it feasible for use as Automobile Fuel.

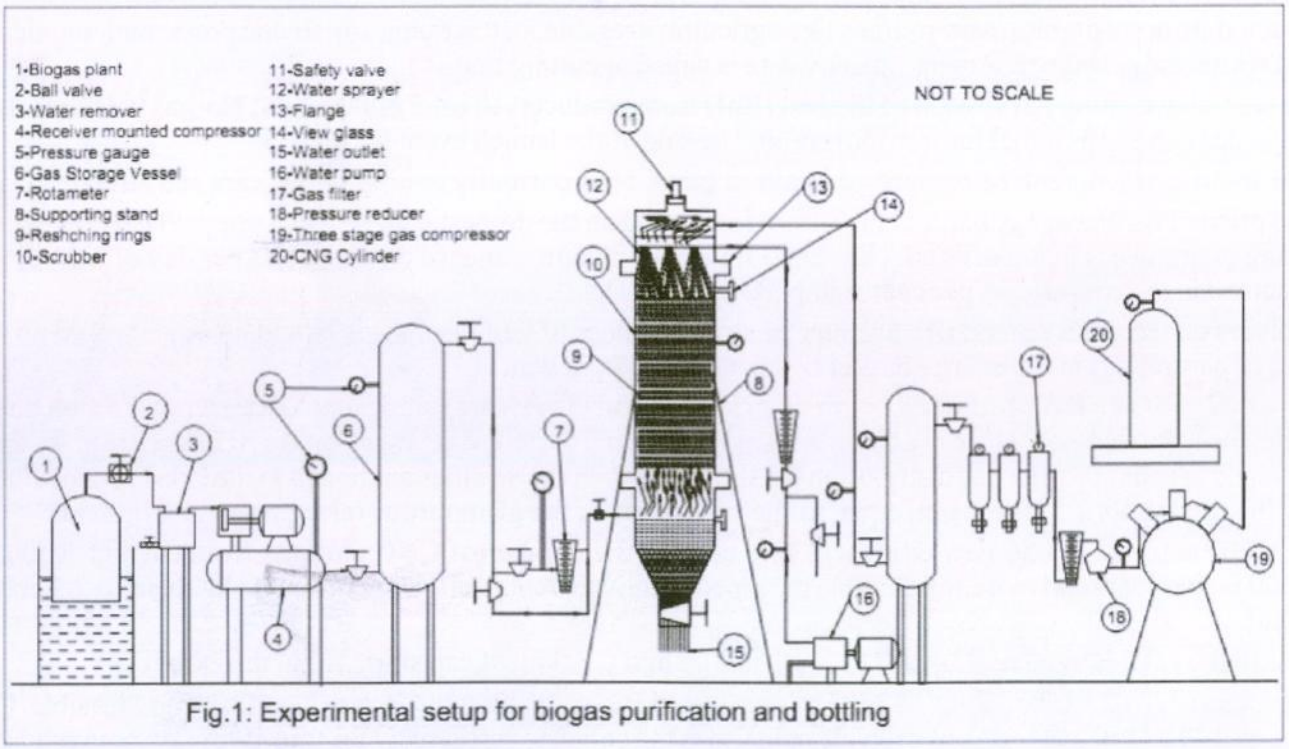


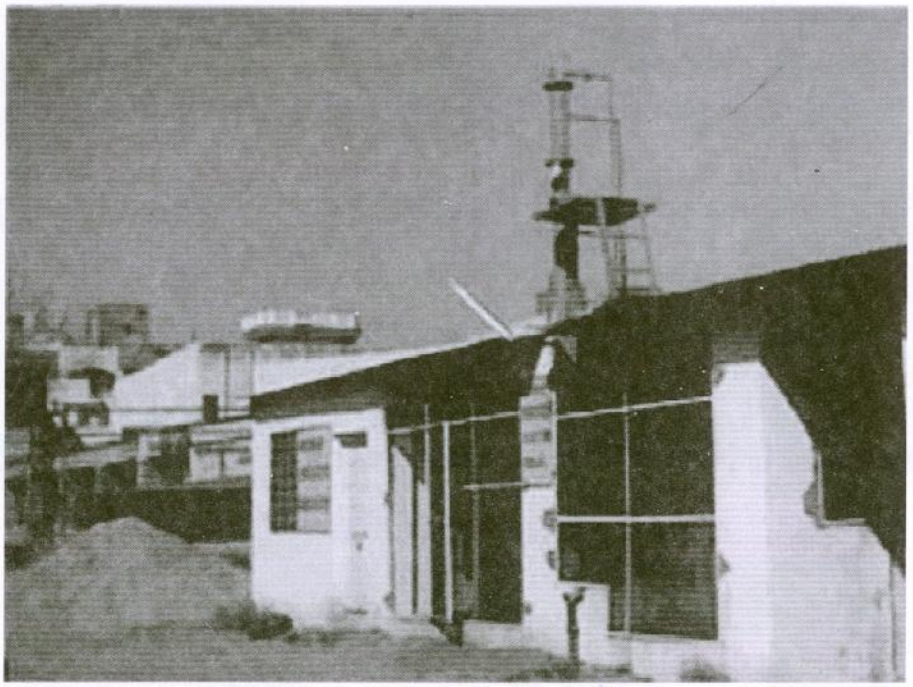
Fig.1: Experimental setup for biogas purification and bottling

In the Process shown above starting from generation of Biogas to final compression of cleaned and enriched Biogas to CBG or Bio CNG, the important stages are Initial compression of Biogas to 10 Bar (4), Water pump increasing the water pressure to 20 Bar (16), injection of Gas at the bottom of the reactor, spraying of water from the top of the reactor and the Methane Compressor (20) clubbed with various other activities of moisture removal, drying etc.

Scrubber:

Water scrubbing system consists of Pressurized (10 Bar) Biogas being passed through a pressurized (20 Bar) Water Spray, which enables the Co_2 in the Biogas to be absorbed by the water. The process takes place in the reactor where the water is sprayed from top and the gas is injected from the bottom. The reactor design is made with sufficient height and diameter depending on the capacity planned and the possible completion of the CO_2 absorption by water process. The Scrubber is shown as part 10 in the diagram with all the allied activities before and after the Scrubber.

The photographs below show the 'Reactor' designed with suitable height going above the roof of the process shed, in a Pilot Plant set up in a centre.



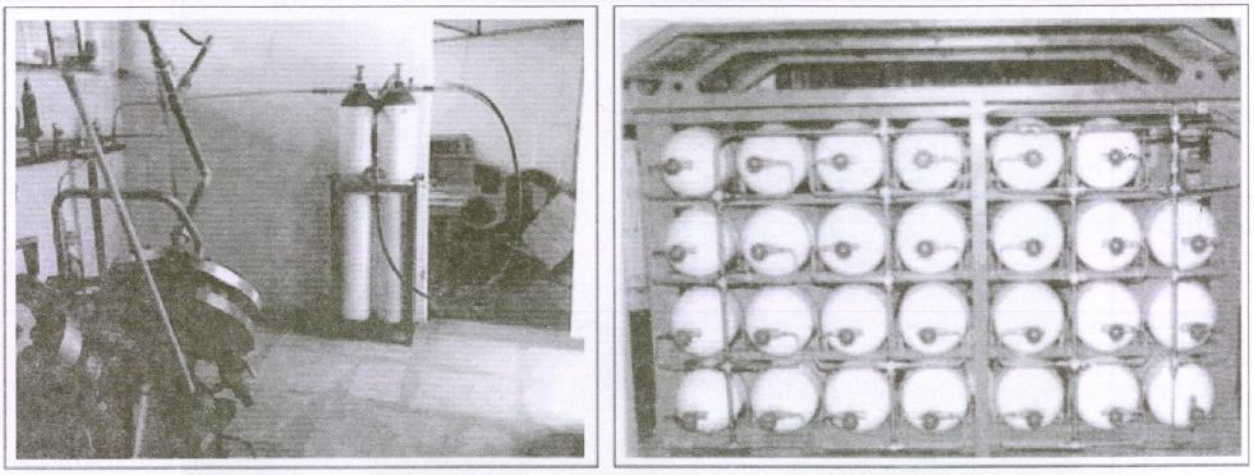
Compression:

The cleaned up Biogas, now known as Bio CNG is compressed to 200 bar pressure making it convenient for storage, transportation and usage. The design of compressors dedicated for use with Methane Gas are already developed for Natural Gas which can be used for the processed Biogas

Storage, Handling and Dispensing:

Technologies are already in place for Design and manufacture of Cylinders and storage and Transportation and Dispensing of Gas to vehicles, for the CNG Gas (all at 200 Bar Pressure) which can all be used for Bio CNG or the CBG now processed.

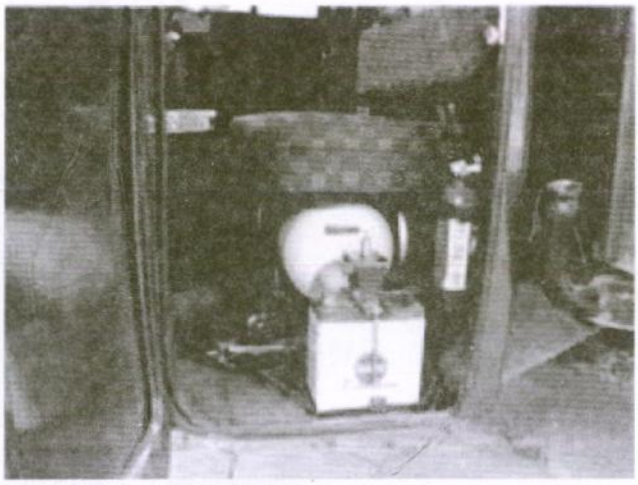
Automobile Manufacturers of 3 Wheelers, 4 Wheelers and Trucks are all manufacturing vehicles for CNG, including fuel storage facilities at 200 Bar pressure.



Cylinders for Storage of CNG or CBG or Bio CNG

CNG Dispensing Station which can become stations for CBG.

Biogas that has been upgraded by removing hydrogen sulphide, carbon dioxide and moisture is known as biomethane or Bio CNG, which is less corrosive oxide than biogas, apart from being more valuable as a vehicle fuel. The typical composition of raw biogas does not meet the minimum CNG fuel specifications. In particular, the CO_2 and sulfur content in raw biogas is too high for it to be used as vehicle fuel without additional processing.



Car, Autoriksha, Trucks with Cylinders for storing CNG or CBG

Applications of Bio CNG

The utilization of Bio CNG as a source of energy is a crucial step toward a sustainable energy supply. Bio CNG is more flexible in its application than other renewable sources of energy. Its ability to be injected directly into the existing natural gas grid allows for energy-efficient and cost-effective transport. This allows gas grid operators to enable consumers to make an easy transition to a renewable source of gas. The diverse, flexible spectrum of applications in the areas of electricity generation, heat provision, and mobility creates a broad base of potential customers.

Bio CNG can be used to generate electricity and heating from within smaller decentralized, or large centrally located combined heat and power plants. It can be used by heating systems with a highly efficient fuel value, and employed as a regenerative power source in gas-powered vehicles.

Bio CNG to Grid

Biogas can be upgraded to Bio CNG and injected into the natural gas grid to substitute natural gas or can be compressed and fuelled via a pumping station at the place of production. Bio CNG can be injected and distributed through the natural gas grid, after it has been compressed to the pipeline pressure.

One important advantage of using gas grid for Bio CNG distribution is that the grid connects the production site of Bio CNG, which is usually in rural areas, with more densely populated areas. This enables the gas to reach new customers.

(To be continued)

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Mobile: 98401 55209

வீட்டைக் குளிர்ச்சியாக்கும் கூரை

ஜூன் 5: உலகசுற்றுச்சூழல் நாள்

கத்திரிவெயில் முடிந்துவிட்டது என்று செய்தியில் தான் சொல்கிறார்கள். ஆனால், வீட்டை விட்டு வெளியேவந்தால், இன்னமும் வெயில் உச்சிமண்டையைப் பிளக்கிறது. சென்னையைத் தவிர. பிறமாவட்டங்கள் ஒருசிலவற்றில் பரவலாக மழை பெய்துவருகிறது. இருந்தும் அங்கும் கூட வெயில் தணிந்தபாடில்லை.

பருவமழை தொடங்கி விட்ட தமிழகத்திலேயே இப்படி என்றால், தக்கான பீடபூமியில் இருக்கும் தெலங்கானா, ஆந்திரா போன்ற மாநிலங்களில் அடிக்கிற வெயிலைப் பற்றிக் கேட்கவா வேண்டும்..? ஆனால், தெலங்கானாவில், அதுவும் ஹைதராபாத்வாசிகள், 'வெயிலா... என்னப்பா சொல்றீங்கலு..? எங்கவீட்டுக் குள்ளாற வந்து பாருங்கலு. ஏ.சி.யே இல்லாம என்னா இதமா இருக்கு தெரியுமாலு..' என்று கோங்குரா சட்னியைச் சாப்பிட்டு விட்டு 'குளிர்ச்சியாகப் பேசுகிறார்கள்.

தேவரகொண்டாகுடிசைப் பகுதி

அவர்களின் ரகசியத்தைத் தேடி ஹைதராபாத்திலுள்ள தேவரகொண்டா குடிசைப் பகுதிக்குச் சென்றோம். அங்குள்ள சில மக்களின் வீடுகள், உண்மையிலேயே அவ்வளவு குளிர்ச்சியாக இருக்கின்றன. மின்விசிறி கூட இல்லை. 'என்னமாயம் இது..?' என்று ஆச்சரியப்பட்டால். அதற்கு விளக்கம் தருகிறார், **பேராசிரியர் ராஜ்கிரண் பிலோலிகர்**. இவர், ஹைதராபாத்தில் உள்ள **'அட்மினிஸ்ட்ரேட்டிவ் ஸ்டாப் காலேஜ் ஆ.ப் இந்தியா (ஏ.எஸ்.சி.ஐ.)** நிறுவனத்தில், **'ஆற்றல் சேமிப்பு'** துறையில் பணிபுரிந்து வருகிறார். நாட்டில் உள்ள ஐ.ஏ.எஸ்., ஐ.பி.எஸ்., போன்ற குடிமைப் பணியாளர்கள், அரசு அலுவலர்கள் போன்றவர்களுக்குப் பயிற்சியளிக்கும் கல்விநிறுவனம் அது.

வெப்ப அலைக்கு முற்றுப்புள்ளி

ராஜ்கிரண் பிலோலிகர்

"நாளுக்குநாள் பூமி சூடாகி வருவது அனைவரும் அறிந்ததே. பருவநிலை மாற்றத்தின் முக்கிய அறிகுறி இது. 2015-ம் ஆண்டு நாட்டில் மிதமிஞ்சிய அளவுக்கு வெயில் அடித்தது. அதனால் ஏற்பட்ட வெப்ப அலையில் நாடுமுழுக்க 2,300 பேர் உயிரிழந்தனர். இதை நம்மால் தடுத்திருக்க முடியுமா? முடியும். எப்படி? கூல் ரூ.ப் என்று சொல்லப்படும் குளுமையான கூரைகளை அமைத்தால் போதும்" என்கிறார் ராஜ்கிரண்.

"நகர்ப்புற இந்தியாவில் சுமார் 60 சதவீதக் கட்டிடங்கள், பல்வேறு உலோகங்கள், ஆஸ்பெஸ்டாஸ், கான்கிரீட் போன்றவற்றைப் பயன்படுத்தித் தான் கூரைகள் அமைக்கப் பட்டிருக்கின்றன. அந்தக் கூரைகளால், வீட்டுக்குள் வெப்பம் படர்வதைத் தடுக்க முடியவில்லை. மின் விசிறி போன்றவற்றை வைத்துச் சமாளிக்கலாம் என்றால், பல நேரம் மின்சார வசதியும் இருப்பதில்லை. இப்படி யொரு இக்கட்டான சூழலில், குறைந்த செலவில், அதிகவேலைப் பாடுகள் தேவைப்படாமல், வீட்டைக் குளுமையாக வைத்துக் கொள்ள உதவுகிறது கூல் ரூ.ப்" என்கிறார் ராஜ்கிரண்.

கோடையில் 'விரிப்பு', மழையில் 'மடிப்பு'

அதென்ன கூல் ரூ.ப்? இவை, சுண்ணாம்பு அல்லது அக்ரிலிக் பாலிமர் அல்லது ப்ளாஸ்டிக் தொழில்நுட்பம் போன்றவற்றைப் பயன்படுத்தி உருவாக்கப்பட்ட 'கோட்டட்' கூரைகளாகவோ அல்லது பாலிவினைல் குளோரைடு அல்லது 'ஹை டென்ஸிட்டிபாலி எத்திலின் போன்ற பொருட்களைக் கொண்டு உருவாக்கப்பட்ட 'மெம்பரேன் ஷீட்' கூரைகளாகவே அல்லது சைனாமொஸைக் டைல்ஸ் கற்களைப் பயன்படுத்தி கட்டப்பட்ட கூரைகளாகவே இருக்கலாம். இந்தவிதமான கூரைகளுக்கு, கீழே

விழுகிற வெப்பத்தை, வீட்டுக்குள் பரவவிடாமல், திரும்பவளி மண்டலத்துக்கே அனுப்பும் திறன் உண்டு.

வீடுகளின் மீது விரிக்கப்பட்டுள்ள 'மெம்பரேன் ஷீட்' விரிப்புகள்

"மேற்கொண்ட கூரைவகைகளில், **'மெம்பரேன் ஷீட்'** கூரைகள் தான் மிகவும் விலை குறைந்தவை. இதுபடுக்கைவிரிப்புபோன்று இருக்கும். ஒரு படுக்கையறை, ஒருவரவேற்பறை, ஒருசமையலறை கொண்ட வீடு ஒன்றுக்கு, சுமார் ரூ. 3 ஆயிரம் அல்லது ரூ. 4 ஆயிரத்துக்குள், இந்த விரிப்புக்காகச் செலவிட வேண்டியிருக்கும். வெயில் காலங்களில் இதை வீட்டின் கூரையின் மீது விரித்து வைத்து விட வேண்டும். அப்போது வீட்டுக்குள் வெப்பம் பரவுவது தடுக்கப்பட்டு, குளுமை பரவும். பொருளாதாரத்தில். கீழ் நிலையில் உள்ளவர்கள், மழைக் காலங்களில் இந்த விரிப்பை, படுக்கை விரிப்பாகவும், போர்வையாகவும் கூடப் பயன்படுத்திக் கொள்வதை நாங்கள் கண்டிருக்கிறோம்" என்கிறார் ராஜ்கிரண்.

பரிசோதனை முயற்சியின் பலன்

2017-ம் ஆண்டு இப்படியான **'குளுமைக் கூரைகள்'** முயற்சி. அகமதாபாத் நகரத்தில், பரிசோதனை முறையில் பயன்படுத்தப்பட்டது. அதற்குமக்களிடம் நல்ல வரவேற்பு கிடைக்கவே, அங்கு தற்போது, இதைப் பரவலாக்கும் நடவடிக்கைகள் மேற்கொள்ளப்பட்டு வருகின்றன.

அதைத் தொடர்ந்து கடந்த ஆண்டுமே–ஜூன் மாதங்களில், ஹைதராபாத்தில், ராஜ்கிரண் பிலோலிகர், ஹைதராபாத்தில் உள்ள ஐ.ஐ.டி.யைச் சேர்ந்த பேராசிரியர் விஷால் கார்க் ஆகிய இருவரும், தேவரகொண்டா குடிசைப் பகுதியில் 50 வீடுகளில் இதைப் பரிசோதனை முயற்சியாக மேற்கொண்டார்கள்.

குளுமைக் கூரை விரிப்புகளை விளக்கும் ராஜ்கிரண் பிலோலிகர்

"அந்த 50 வீடுகளில் சுமார் 4 வீடுகளில் சென்ஸார்கள் பொருத்தி. வீடுகளுக்குள் நிலவும் வெப்பத்தைக் கணக்கிட்டோம். இந்தவிரிப்பைப் பயன்படுத்தாதவீடுகளைக் காட்டிலும், விரிப்பைத் தங்கள் கூரைகளில் பயன்படுத்திய வீடுகளில் வெப்பம் குறைவாகவே இருந்தது தெரியவந்தது. இந்தப் பரிசோதனை முயற்சியின் முடிவுகளை தெலங்கானா அரசு அதிகாரிகளிடம் விளக்கினோம். அதைத் தொடர்ந்து, குளுமைக் கூரைகள் தொடர்பாக விரைவில் கொள்கை ஒன்று தயாரிக்கப்பட்டு, மாநிலம் முழுக்க இது நடைமுறைக்குக் கொண்டு வர நடவடிக்கைகள் மேற்கொள்ளப்படும் என்று சொல்லியிருக்கிறார்கள்" என்கிறார் ராஜ்கிரண் பிலோலிகர். இந்தக் குளுமை நாடெங்கும் பரவட்டும்!

குளுமைக் கூரைவிரிப்புகளை உபயோகிப்போம்!

வெப்ப அலையில் இருந்து விடுபடுவோம்!!

Courtesy: தி இந்து,தேதி. ஜூன் 02.06.2018

"Wasting less energy is the better thing to do."

கலங்கி நின்ற நீதிமன்றம்

நீதியரசர் ரத்தினவேல் பாண்டியனைப் பற்றி சில செய்திகள் தான் நமக்குத் தெரியும். அனைவரும் தெரிந்து கொள்ள வேண்டிய நிகழ்வுகள் பல உண்டு. அதில் ஒன்று இந்தச் சம்பவம். குற்றவியல் வழக்குகளில் ஆட்கொணர்வு மனுக்களை விசாரணை செய்யும் பொறுப்பில் ரத்தினவேல் பாண்டியன் இருந்தபோது நடந்த ஒரு வழக்கு பற்றி வழக்கறிஞர் ஒருவர் சொன்ன நேரடி அனுபவச் செய்தி இது.

ஒரு பெண், தனது கணவரைவிட்டுப் பிரிந்து குழந்தைகளுடன் திருநெல்வேலியில் வசித்து வந்தார். தன் குழந்தைகளைத் தனது மனைவி கடத்திச் சென்று விட்டார் என்று கூறி அந்தப் பெண்ணின் கணவர் ஆட்கொணர்வு வழக்கு தாக்கல் செய்தார்.

குழந்தைகளை நீதிமன்றத்துக்கு அழைத்துவர அப்பெண்ணுக்கு நீதிமன்றம் நோட்டீஸ் அனுப்பியது. இரண்டு முறையும் நோட்டீஸைப் பெற்றுக்கொண்ட அந்தப் பெண் நீதிமன்றத்துக்கு வரவில்லை. இதையடுத்து, அவரை நீதிமன்றத்துக்குக் கொண்டுவருமாறு அந்த ஊர்க் காவல்துறை அதிகாரிக்கு நீதிமன்றம் உத்தரவிட்டது. குறித்த நாளில் குழந்தைகளோடு அந்தப் பெண்ணை நீதிமன்றத்தில் நிறுத்தியது காவல்துறை. நீதிபதி பொதுவாக தங்கள் கேள்விகளை அரசு வழக்கறிஞரிடம் தான் கேட்பார்கள். அவர்கள் தான் அந்த நபர்களிடம் பதிலை வாங்கி நீதிபதியிடம் சொல்வார்கள். தேவைப்படும் போதுதான் நீதிபதிகள் வழக்காடிகளை அருகில் அழைத்துப் பேசுவார்கள். இந்த வழக்கு விசாரணை தொடங்கியபோது நீதிமன்றச் சூழல், நடைமுறை ஆகியவற்றால் மிரண்டுபோயிருந்த அந்தப் பெண்ணைப் பார்த்த நீதியரசர் ரத்தினவேல் பாண்டியன், கணவருக்குத் தெரியாமல் குழந்தைகளை ஊருக்கு அழைத்துப்போனது ஏன் என்று கேட்டார். அப்போது, தனது கணவர் செய்த கொடுமைகளைச் சொன்ன அந்தப் பெண், "அவரிடமிருந்து தப்பி, பத்திரமாக இருந்து குழந்தைகளைக் காப்பாற்றத்தான் அழைத்துச் சென்றேன்" என்று சொல்லி அழுதார்.

நீதியரசர் அந்தப் பெண்ணை தன் முன்னால் அழைத்து நேரடியாகக் கேள்விகள் கேட்கத் தொடங்கினார்.

"சரிம்மா, நீதிமன்றத்திலிருந்து இரண்டு முறை நோட்டீஸ் வந்ததா?"

"வந்ததுங்க அய்யா"

"நோட்டீஸ் வந்தும் நீ ஏன் நீதிமன்றத்துக்கு வரவில்லை?"

"வண்டிக்குக் குடுக்க காசில்லை அய்யா"

"சரி, இப்ப எப்படி வந்தாய்?"

"போலீசு வண்டில கூட்டிட்டு வந்தாங்க அய்யா"

நீதிமன்றம் நிசப்தமானது.

"எப்படி திரும்பி ஊருக்குப் போவாய்"

"தெரியல அய்யா. போலீசு வண்டியிலேயே கொண்டு வந்து விடச் சொல்லுங்கய்யா"

மீண்டும் ஒரு துயரம் தோய்ந்த இறுக்கம் நீதிமன்றத்தை நிறைத்தது.

அந்தப் பெண்ணை அருகில் அழைத்த நீதியரசர் சொன்னார்.

"நான் தப்பு பண்ணிவிட்டேன் அம்மா நீ பஸ்ல போ" என்று சொல்லியபடி தன் பர்சில் இருந்து ஒரு நூறு ரூபாய் நோட்டை எடுத்து அந்தப் பெண்ணிடம் கொடுத்தார். "குழந்தைகளுக்குச் சாப்பாடு வாங்கிக் கொடுத்து அழைத்துப் போம்மா" என்றார்.

உடன் இருந்த நீதியரசரும் தன் பையில் இருந்து நூறு ரூபாய் எடுத்துக் கொடுத்தார்.

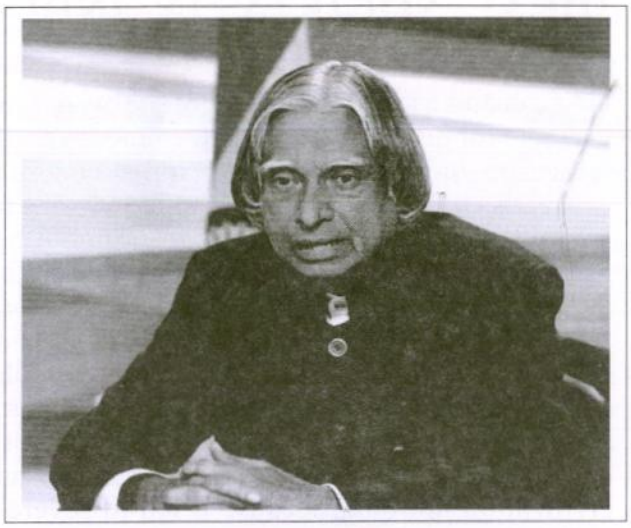
அந்தப் பெண் கும்பிட்டு நன்றி சொல்ல, வழக்கறிஞர்கள் கண்கலங்கினர். அத்துடன் வழக்கை முடிக்கவில்லை நீதியரசர் ரத்தினவேல் பாண்டியன். வழக்கு போட்ட அந்தக் கணவரை அழைத்து, இப்படி உண்மைகளை மறைத்துப் பொய் வழக்கு போட்டு மனைவியையும் குழந்தைகளையும் அலையவிட்டதைக் கடுமையாகக் கண்டித்து, எச்சரிக்கை செய்து அனுப்பினார்.

வாழ்க்கைப் பாடம் என்பது அனுபவத்தில் விளைவது.அதற்கு படிப்பு மட்டும் போதாது. பட்டறிவு வேண்டும் என்பதை நினைவூட்டிக் கொண்டே இருக்கும் வாழ்க்கைப் பயணம் நீதியரசர் ரத்தினவேல் பாண்டியனுடையது.

அ. அருள்மொழி, வழக்கறிஞர்.

Courtesy: *தி இந்து, dt. 05.03.2018*

அப்துல் கலாம்



முன்னாள் குடியரசுத்தலைவர் அப்துல் கலாம் வாழ்வில் ஒரு உண்மைச் சம்பவத்தை இன்று தற்செயலாக "தினகரன்" நாளிதழில் படிக்க நேரிட்டது.... இதோ... அப்துல் கலாமின் வார்த்தைகளில், அவரது இளமைக்கால வாழ்க்கை.

"நான் சிறுவனாக இருக்கும் போது... ஒரு நாள் இரவு நேரம்... வெகு நேர வேலைக்கு பின்னர் என் தாய் இரவு சிற்றுண்டி செய்யத் தொடங்கினார்...

என் தாயும் எங்கள் குடும்பத்தை சமாளிக்க வேலைக்கு செல்வது வழக்கம்...

சமைத்த பின் கருகிய ரொட்டி ஒன்றை என் கண் முன், என் தந்தைக்கு பரிமாறினார் என் தாய்... ஆனால் என் தந்தையோ அதை சிறிதும் பொருட்படுத்தாமல் சாப்பிட்டார்...

'இன்றைய பொழுது பள்ளியில் எப்படிப் போனது' என்று என் தந்தை என்னிடம் கேட்டார். நான் அன்று என்ன பதில் சொன்னேன் என்று தெரியவில்லை..

என் தந்தையிடம் கருகிய ரொட்டியை பரிமாறியதற்கு வருத்தம் தெரிவித்தார் என் தாய்... ஆனால் அதற்கு என் தந்தையோ..."எனக்கு கருகிய ரொட்டிதான் ரொம்ப பிடிக்கும்" என்று பதில் சொன்னதை என்னால் இன்றும் மறக்க முடியாது...

சாப்பிட்டு முடித்த சற்று நேரத்துக்குப் பின்... நான் மெல்ல என் தந்தை அருகில் சென்று இரவு வணக்கம் சொல்லிவிட்டு, அவரிடம் தயக்கத்துடன் கேட்டேன்:

"அப்பா... உங்களுக்கு உண்மையாகவே கருகிய ரொட்டி ரொம்பப் பிடிக்குமா..?"

சற்று நேரம் அமைதியாக இருந்த என் தந்தை, என்னை இறுக்கமாக அணைத்துக் கொண்டு சொன்னார்...

"மகனே... உங்க அம்மா தினமும் வேலைக்கும் சென்று கொண்டு, நமக்கும் பணிவிடை செய்கிறார்... களைத்துப் போய் இருப்பார்...

ஒரு கருகிய ரொட்டி யாரையும் காயப்படுத்தப் போவதில்லை...

ஆனால் கடும் வார்த்தைகள் கண்டிப்பாக காயப்படுத்தும்...

நான் ஒன்றும் சிறந்த மனிதன் அல்ல... ஆனால் அதற்கு முயற்சிக்கிறேன்...

இவ்வளவு வருடங்களில் நான் கற்றுகொண்டது...

"நடப்பது எதுவாக இருந்தாலும் அதை ஏற்றுக்கொண்டு சந்தோஷமான மனநிலைக்கு நாம் மாறுவதே..."

- அப்துல் கலாமின் இந்த அனுபவத்தைப் படித்த போது அவரது அப்பா மீது, அளவில்லாத மரியாதை எழுந்தது...

அது இன்று முழுவதும் என்னைத் தொடர்ந்து வந்தது. ஆம்..

"ஒரு கருகிய ரொட்டி யாரையும் காயப்படுத்தப் போவதில்லை...

ஆனால் கடும் வார்த்தைகள் கண்டிப்பாக காயப்படுத்தும்..."

- இந்த தத்துவத்தை எண்ணியபடியே இன்று இரவு சாப்பிட அமர்ந்தபோது...

எனக்கு பரிமாறப்பட்ட உணவு கொஞ்சம் ஆறித்தான் போய் இருந்தது...

ஆனால் என் உணர்வுகள் ரொம்பவுமே மாறிப் போய் இருந்தது...

மனைவியின் உணவை இனி ஒருபோதும் குறை சொல்லக் கூடாது என்ற திருந்திய மன உணர்வோடு, இருந்ததை இனிதே உண்டு முடித்தேன்...

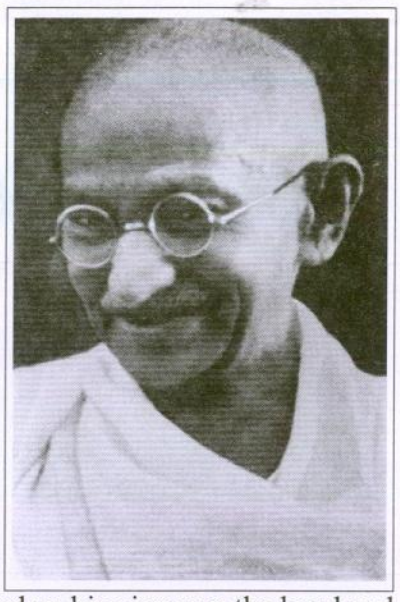
- எதிர்காலத்தில் நம் குழந்தைகள் கலாமின் கொள்கைகளை கடைப்பிடிக்கட்டும். இப்போது நாம் கொஞ்சம் அவரது அப்பாவின் கொள்கைகளை கடைப்பிடிக்கலாமே...!!!

1. **கோபம் - உங்கள் கல்லீரலை பாதிக்கிறது**
2. **பயம் - உங்கள் சிறுநீரகத்தை பாதிக்கிறது**
3. **மன அழுத்தம் - உங்கள் இருதயம் மற்றும் மூளையை பாதிக்கிறது**
4. **துக்கம் - உங்கள் நுரையீரலை பாதிக்கிறது**
5. **கவலை – உங்கள் குடலை பாதிக்கிறது**

1. **ஆற்று நீர் வாதம் போக்கும்**
2. **அருவி நீர் பித்தம் போக்கும்**
3. **சோற்று நீர் இரண்டையும் போக்கும்**

SOME EXCERPTS FROM AN ARTICLE ON THE SUBJECT GANDHI'S VISION OF THE IDEAL SOCIETY IN INDIA

Gandhi's Vision of the Ideal Society in India!



The discussion focuses first on the elements that Gandhi thought contributed towards the making of an ideal society, second on his continually evolving concept of swaraj followed by his conceptualization of Ram Rajya, democracy, the republic, citizenship and education, and third on his views on the legal and medical professions and on industrialization.

Gandhi's vision of the ideal society is that of a non-violent and democratic social order in which there is a just balance between individual freedom and social responsibility. He has a very high regard for the place of ideals in human life. Without ideals, he says, life can have no meaning because there would be no goals towards which human endeavour can be directed.

His supreme ideal, is self-realization, or knowing God and merging in him. But this, he admits, is not possible entirely as long as man exists in the flesh and remains subject to its desires. What is possible for him is to lead a life and help construct a society (for man is a social being) that will help him come closest to the supreme goal.

Apart from the influence of his upbringing and education, Gandhi's conception of the ideal society is in a large measure the result of his distaste for the modern civilization of the west. His views on this subject are set forth in the booklet he wrote, Hind Swaraj. He clearly states in his introduction to the book that his negative ideas on modern civilization are not original, but acquired from the writings of several great writers and thinkers.

Another factor that moulded Gandhi's vision of the ideal society was his love for the simple life. This arose in the first instance from his own roots in the small towns of Porbandar and Rajkot in Kathiawar. Later, his reading, though selective and generally restricted to theological and philosophical works, affected him deeply.

The Phoenix Trust Deed is a very significant document for it contains a model of the type of society he wished to create for humanity. Among the objectives of the settlers on Phoenix Farm were: to order one's life so as to earn a living through handicrafts and agriculture without the aid of machinery; to promote better understanding between peoples; to live a pure life and thereby set an example for others; to try and promote the ideals of Ruskin and Tolstoy; to introduce vernacular education; to propagate the philosophy of 'nature treatment' in the medical field; to train for social service; and finally to conduct a journal for the advancement of these Gandhi was critical of industrial civilization not only because it led to severe and wasteful competition for goods and markets leading to colonization of weaker nations and exploitation of the countryside, but also because it led to displacement of manual labour and growing unemployment.

In contrast was Indian civilization in which there was "no system of life corroding competition". Each followed his own occupation or trade and charged a regulation wage. On balance, Gandhi finds that the tendency of Indian civilization "is to elevate the moral being", while "that of western civilization is to propagate immorality".

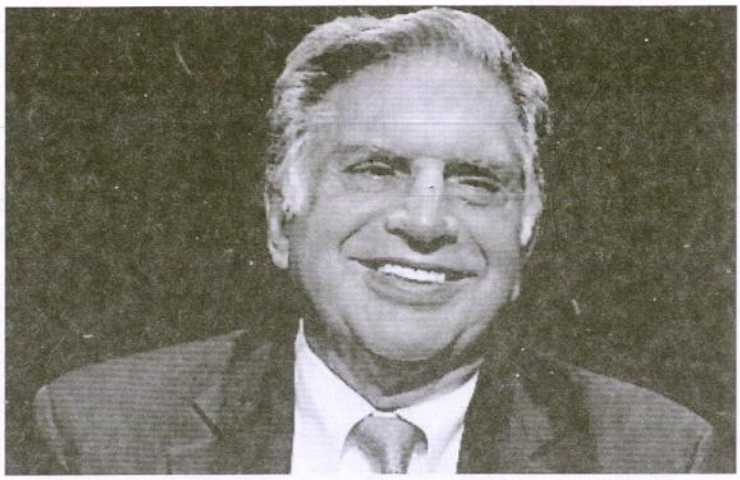
This rather harsh condemnation of the west may be viewed in the background of his deep faith in a supreme creator and the necessity of spirituality in a civilization, both of which he found lacking in his experience of western life.

Another element in Gandhi's thinking is very significant for his conceptualization of an ideal society. This is the doctrine of bread labour.

In broad terms, bread labour means that one should eat only after doing adequate labour to earn it. Gandhi is positive that bread labour meant manual labour alone and not intellectual labour. His logic is: "The needs of the body must be supplied by the body."

He also feels that in any society, there are many individuals who can work physically or mentally to an extent that is more than is required to sustain themselves. The products of their surplus labour capacity should, according to Gandhi's principle, be devoted to the common good.

If this principle were followed, he asserts, there would be "no rich and no poor, none high and none low, no touchable and no untouchable". He believes that it is the wide gulf between manual and intellectual labour that is the cause of poverty and inequality in society.



RATAN NAVAL TATA
Chairman TATA Trust

Ratan Tata grew the Tata group into a world-Beater. Now, with the Tata Trusts, he wants nothing less than to change the world.

After ruling the Tata Empire for more than two decades as its chairman, Ratan retired on December 28, 2012. Even though he retired, he remains a business icon, an aspirational leader, and a symbol of good corporate governance.

A man who did what no global carmaker believed was possible: to build a car that looked this good and drove so well for so low a price. Nano managed the impossible. Ratan even kept to the price commitment. Though input costs had gone up, he said, the Tata's would still price the basic Nano at a lakh because "a promise is a promise".

By virtue of his audacious international acquisitions, including Corus, jaguar and Land Rover, he continues to give India Inc. the confidence to go global.

Ratan is chairman of the four philanthropic Tata trusts, and as per media reports, they are among the world's top trusts in terms of generosity. In 2010, the trusts spent Rs. 500 crore on causes such as education, disaster relief, health and art. The Tata Trusts disbursed more grants in the last 10 years than they did in the previous 100 years. Established in 1919, the Sir Ratan Tata Trust (SRTT) is one of the oldest philanthropic institutions in India, and has played a pioneering role in changing traditional ideas of charity. The Tata Trusts control 66 percent of the shares of Tata Sons, the holding company of the group. The Trusts have set up prestigious institutions like Tata Memorial Hospital and National Centre for the Performing Arts in Mumbai.

Ratan has served in various capacities in organizations in India and abroad. He is a member of the Prime Minister's Council on Trade and Industry. He is on the board of governors of the East-West Center, the advisory board of R&D's Center for Asia Pacific Policy and serves on the program board of the Bill & Melinda Gates Foundation's India AIDS initiative. On India Today High and Mighty power list 213, he has been ranked No. 2.

எந்த உணவுக்கு எது நிவாரணம்?

மாங்காய், மாம்பழம் அதிகமாக சாப்பிட்டால் அதற்குப் பால் ஒரு டம்ளர் குடிக்கவும்.

உணவில் அதிக நெய் சேர்த்தால் ஒரு கப் எலுமிச்சை ஜூஸ் குடிக்கவும்.

பலாப்பழம் அதிகம் சாப்பிட்டால் ஒரு வாழைப்பழம் சாப்பிடலாம்.

கேக் நிறைய சாப்பிட்டால் அதற்கு ஒரு டம்ளர் வெண்ணீர் குடிக்கவும்.

அசைவ உணவுகள் அதிகம் சாப்பிட்டால் ஸ்வீட் சிறிது சாப்பிடலாம்.

தேங்காயில் செய்த பதார்த்தங்களை அதிக அளவு சாப்பிட்டுவிட்டால் அதற்கு கொஞ்சம் அரிசி எடுத்து மென்று சாப்பிடலாம்.

குடல் புண் அதிகம் இருந்தால் அடிக்கடி வாழைப்பூ சமைத்துச் சாப்பிடலாம்.

காய்ச்சலுக்கு தண்ணீர் அதிகம் குடிக்க - காய்ச்சலின் வேகம் குறையும். கருந்துளசி நீர் காய்ச்சலைக் குறைக்கும்.

விசாலினி

தமிழக மாணவியை அழைத்து வாழ்த்து தெரிவித்தார் பாரத பிரதமர் திரு. நரேந்திர மோடி அவர்கள்.

உலகிலேயே அதிக அறிவுத்திறன் கொண்ட திருநெல்வேலியை சேர்ந்த சிறுமி விசாலினி... வாழ்த்துக்கள்...

11 வயதில், தனக்குரிய இணையதளத்தைத் தானே வடிவமைத்தவர்.

அதுவும் 24 மணிநேரத்தில், தான் கற்றதோடு மட்டும் நிறுத்தவில்லை இவர். கற்பிக்கவும் தொடங்கினார்.

தன் 11 வயதில், 25க்கும் மேற்பட்ட இன்ஜினியரிங் கல்லூரிகளுக்கு அழைக்கப்பட்டு அங்கு Final Year மாணவர்கள், கல்லூரிப் பேராசிரியர்கள், துறைத் தலைவர்கள் (HOD's), முதல்வர்களுக்கு Seminar வகுப்புகளை நடத்தியவர்.

இவரது திறமையை அறிந்த "Indian Overseas Bank" நிர்வாகம் சர்வதேச தலைமையகத்துக்கு வருகை தருமாறு அழைப்புவிடுத்த போது விசாலினிக்கு வயது 12 தான்".

அங்கு உலக அளவிலான IOB GM தலைமையிலான IT Professionalகளுக்கு ½ மணி நேரம் வகுப்பு எடுக்கச் சொன்னார்கள். ஆனால் விசாலினியோ 2 மணிநேரம் பாடம் நடத்தி அனைவரையும் பிரமிக்க வைத்தாள்.

தன் சொந்தமுயற்சியால் மட்டுமே உலகின் பல்வேறு நாட்டு அறிஞர்களின் பாராட்டைப் பெற்ற விசாலினி, ஓர் இந்தியர். அதுவும் தமிழர். ஆம்! உண்மை தான். **"தமிழனின் மூளை தரணியையே வெல்கிறது".** HCL நிறுவனம் The Pride of India -Visalini என பாராட்டிய போது அவருக்கு வயது 11.

TEDx சர்வதேச மாநாட்டில் தலைமை உரை ஆற்றிய விசாலினி 11 வயதில், **The Youngest TEDx Speaker** என்ற பட்டமும் பெற்றார். London, World Records University, Dean தாமஸ் பெய்னிடம் பாராட்டு பெற்றார் விசாலினி.

Times Now English News நிறுவனமோ ஒருபடி மேலாக விசாலினியின் வீட்டிற்கே வந்து 2 நாட்கள் தங்கி அவரைப் பற்றிய தகவல்களைத் திரட்டி, The Amazing Indian – Visalini என அரை மணிநேர Documentry படத்தை ஒளிபரப்பியது.

நியூ சவுத் வேல்ஸை தலைமையிடமாகக் கொண்டு, காமன் வெல்த் ஆப் ஆஸ்திரேலியாவால் தொடங்கப்பட்ட ஆஸ்திரேலியாவின் முன்னணிச் செய்தி நிறுவனமான SBS ஆஸ்திரேலியா, உலகின் 74 மொழிகளில் 174 நாடுகளில் விசாலினியின் அரை மணிநேர பேட்டியை ஒலிபரப்பி கௌரவப் படுத்திய போது விசாலினிக்கு வயது 13 தான்.

ஒரு ஞாயிற்றுக்கிழமை மாலையில் விசாலினியின் தந்தைக்கு வந்தது ஒரு Phone Call. Our Prime Minister Mr. Modi wants to meet your daughter Visalini என்று.

பிரதமரைக் கண்ட விசாலினி, எழுந்து நின்று தமிழில் வணக்கம் என்று சொல்ல, பதிலுக்கு தமிழிலேயே வணக்கம் என்றார் பிரதமர் மோடி.

விசாலினியுடன் உரையாடியபோது, இந்தச் சிறுவயதில் நீ செய்துள்ள சாதனைகளே, இந்திய நாட்டிற்கான சேவைதான் என்று நெகிழ்ந்து பாராட்டினார், பிரதமர்.

திருநெல்வேலி மாவட்ட கலெக்டர் கருணாகரனோ, விசாலினி இந்திய தகவல் தொழில் நுட்பத் துறையில் முக்கியப் பங்காற்றுவார் என்று பெருமை பொங்க வாழ்த்தினார்.

உலக அளவில் பாராட்டு பெற்றுள்ள விசாலினிக்கு, தான் இன்னும் தமிழக முதல்வரின் பாராட்டைப் பெறவில்லையே என்பது மிகப்பெரிய ஆதங்கம்.

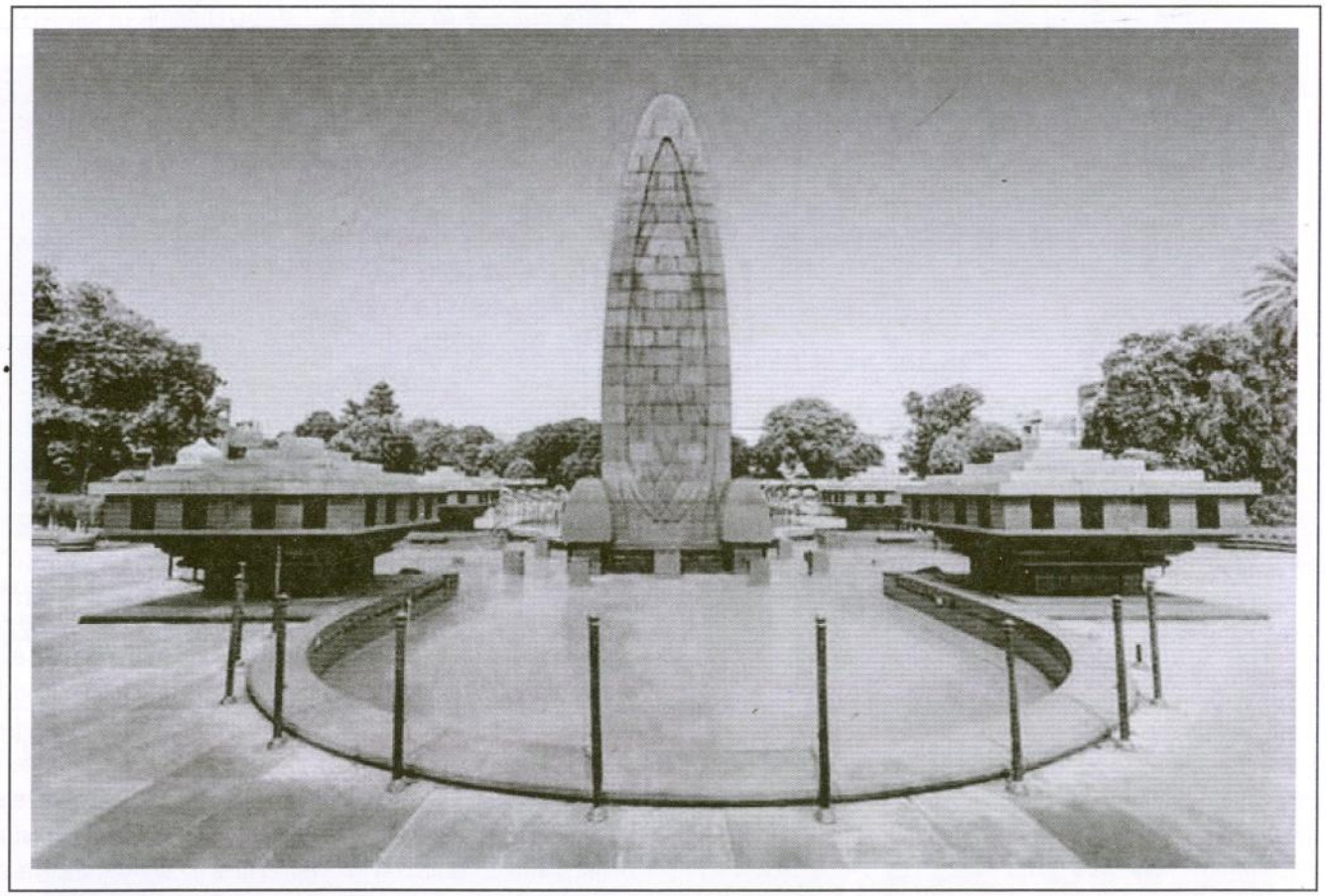
உங்களுக்குத் தெரியுமா, சாதாரண மனிதர்களின் அறிவுத்திறன் 90 முதல் 110 வரை இருக்கும். கம்ப்யூட்டர் ஜாம்பவான் பில்கேட்சுக்கு IQ level 160. ஆனால் விசாலினியின் IQ level 225. உலகிலேயே மிக அதிக அறிவுத் திறன் கொண்டவர் என்ற உலக சாதனை படைத்த விசாலினி, நம் இந்தியாவின் தமிழ்நாட்டின் திருநெல்வேலியைச் சேர்ந்தவர். உலகிலேயே இல்லை இப்படி ஒரு குழந்தை என்று சாதித்துக் கொண்டிருக்கும் விசாலினியின் தந்தை ஓர் எலக்ட்ரீசியன். தாத்தாவோ வெல்டராக இருந்து, பின் தமிழாசிரியராக ஆனவர்.

"இந்தத் தமிழ் மகள் பெருமையை தரணி எங்கும் பறைசாற்றுங்கள்".

வியப்பூட்டும் இந்தியா - 10

துயரத்தின் சாட்சி

ஜாலியன்வாலா பாக் என்றதும் அந்தத் துயரமான சம்பவம்தான் நம் நினைவுக்கு வரும். சுதந்திரப் போராட்டக் காலத்தில் நூற்றுக்கணக்கான இந்தியர்களைக் கண்மூடித்தனமாகச் சுட்டுக் கொன்ற இடம் இது. 'பாக்' என்றால் தோட்டம் என்று பொருள். ஜாலியன்வாலா பாக் 6.5 ஏக்கர் பரப்பில் அமைந்துள்ள மிகப் பெரிய தோட்டம். இது பஞ்சாப் மாநிலத்தில் அமிர்தசரஸ் நகரில், உலகப் புகழ்பெற்ற பொற்கோயிலுக்கு அருகில் இருக்கிறது.



பஞ்சாபை ஆண்ட மகாராஜா ரஞ்சித்சிங்கிடம் பணிபுரிந்த சர்தார் ஹிமத்சிங் என்பவருக்குச் சொந்தமான தோட்டம் இது. அவர் குடும்பம் 'ஜல்லா' என்ற கிராமத்திலிருந்து வந்ததால் 'ஜாலியன்வாலா பாக்' என்று பெயர் பெற்றது.

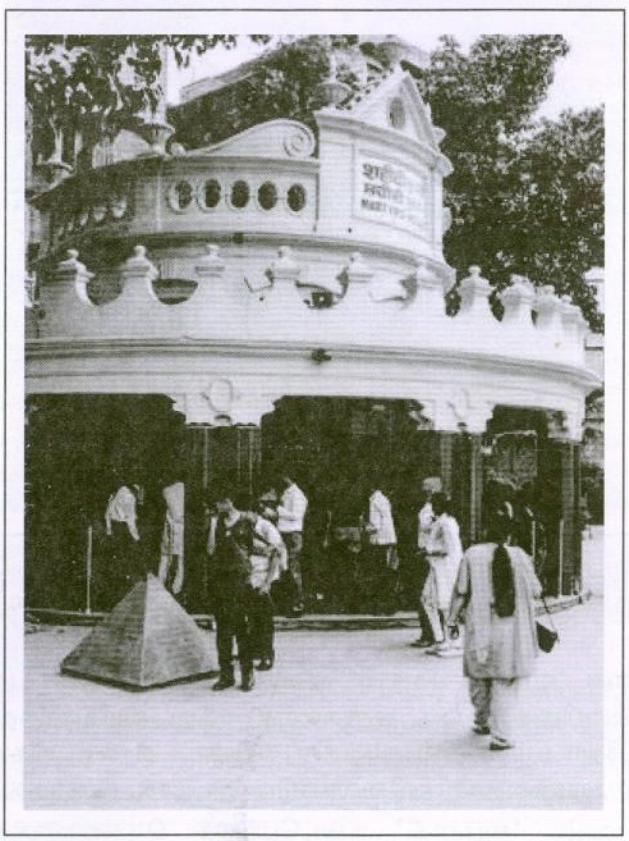
தோட்டத்தைச் சுற்றி குறுகிய நுழைவாயில்கள் உள்ளன. ஆனால் பிரதான நுழைவாயிலைத் தவிர, மற்ற வாயில்கள் அனைத்தும் மூடப்பட்டுள்ளன. பிரதான வாயிலுக்கு ஒரு குறுகலான சந்து வழியாகத்தான் வரவேண்டும். உள்ளே வந்தால் மிகப் பெரிய அழகான தோட்டம். இதில் சுதந்திரப் போராட்டக் கூட்டங்களும் திருவிழாக்களும் நடைபெற்றுவந்தன. மற்ற நாட்களில் குழந்தைகள் விளையாடும் இடமாக இருந்தது.

சீக்கியர்களின் மிகப் பெரிய அறுவடைத் திருவிழாவான 'பைசாகி' நடைபெற்றுக் கொண்டிருந்தது. திருவிழாவுக்கு ஆண்கள், பெண்கள், குழந்தைகள் என்று ஏராளமானவர்கள் கூடியிருந்தனர். சில மாதங்களுக்கு முன் ஆங்கிலேயர்கள் கொண்டு வந்த ரௌலட் சட்டத்தால், நாடே கொந்தளித்துக் கொண்டிருந்தது. விசாரணை இல்லாமலேயே யாரையும் தண்டனைக்கு உட்படுத்தலாம் என்பதுதான் அந்தச் சட்டத்தின் முக்கிய அம்சம். குறிப்பாக பஞ்சாப், வங்காள மக்கள் அந்தச் சட்டத்தைக் கடுமையாக எதிர்த்தார்கள்.

பஞ்சாப் தலைவர்களை ஆங்கிலேய அரசு முன்னெச்சரிக்கை நடவடிக்கையாகக் கைது செய்தது. ஊரடங்குச் சட்டம் பிறப்பிக்கப்பட்டது. இதனால் மக்கள் மிகவும் கோபமடைந்தனர்.

ஏப்ரல் 13, 1919-ம் ஆண்டு, திருவிழாவைக் கொண்டாடுவதற்குப் பொதுமக்கள் ஒன்று கூடியிருந்தனர். அப்போது ஜெனரலாக இருந்த எட்வர்ட் டயர், முன்னறிவிப்பு இன்றி ராணுவத்தை வைத்து துப்பாக்கிச்

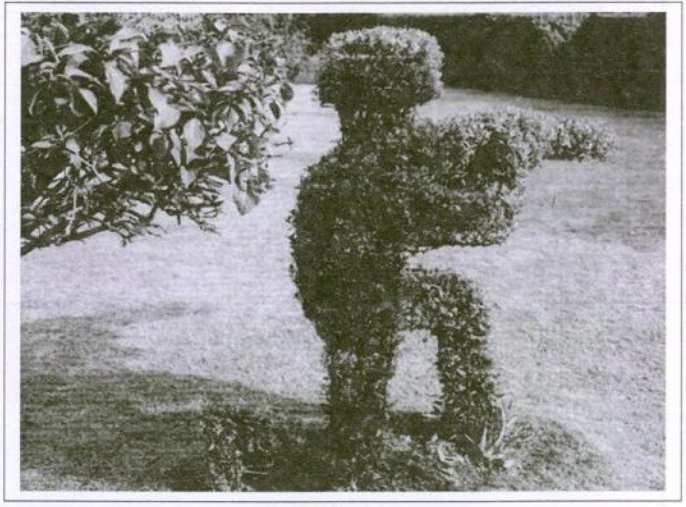
சூட்டை நிகழ்த்தினார். பத்து நிமிடங்களில் 1650 குண்டுகள் சீறிப் பாய்ந்தன. மக்கள் பயந்து ஒருவர் மேல் ஒருவர் விழுந்து, சிறிய நுழைவாயில் வழியாக வெளியே செல்ல முடியாமல் இடிபாடுகளில் சிக்கி மடிந்தனர்.



துப்பாக்கிக் குண்டுகளுக்கு பயந்து 120 பேர் அங்கிருந்த கிணற்றில் குதித்து இறந்தனர். மகிழ்ச்சியான அறுவடைத் திருவிழா, துயரத்தில் முடிந்தது.

ஆங்கிலேய அரசு இறந்தவர்களின் எண்ணிக்கையை 379 என்று கூறியது. ஆனால் 1500-க்கும் மேற்பட்டவர்கள் இறந்திருக்கலாம் என்று கூறப்பட்டது. இந்திய விடுதலைப் போராட்ட வரலாற்றில் இது முக்கியத் திருப்பு முனையாக அமைந்தது.

பண்டிட் மதன் மோகன் மாளவியா அந்த இடத்தை தேசிய நினைவுச் சின்னமாக மாற்ற அனைத்து முயற்சிகளையும் மேற்கொண்டார். அமெரிக்கக் கட்டிடக்கலை நிபுணர் பெஞ்சமின் போல்க் நினைவுச் சின்னத்தை எழுப்பினார்.



தற்போது ஜாலியன்வாலா பாக்கில் பசுமையான செடிகளுக்கும் புற்களுக்கும் நடுவே 30 அடி உயரத்தில் நினைவுச் சின்னம் கம்பீரமாக நின்றுகொண்டிருக்கிறது. நான்கு பக்கங்களிலும் கற்களாலான லாந்தர் விளக்குகள் பொருத்தப்பட்டுள்ளன. இது **'சுதந்திரச் சுடர்'** என்று அழைக்கப்படுகிறது. நடுவில் அசோகச் சக்கரமும் அதன் கீழ் **'உயிர் நீத்த தியாகிகளின் நினைவாக'** என்ற வாசகங்களும் பொறிக்கப்பட்டுள்ளன. சுவர்களில் பாய்ந்த துப்பாக்கிக் குண்டுகளின் அடையாளங்கள் அப்படியே விடப்பட்டுள்ளன. பலரை விழுங்கிய கிணற்றை வலையுடன் கூடிய சுற்றுச்சுவர் அமைத்து பாதுகாத்துவருகின்றனர்.

ஜாலியன்வாலா பாக் ஒளிப்படங்களும் பத்திரிகைச் செய்திகளும் ஓர் அறையில் பார்வைக்கு வைக்கப்பட்டுள்ளன. 50 நிமிடங்களுக்கு நடக்கும் ஒளி–ஒலி காட்சியை அவசியம் காண வேண்டும். இன்று அமைதியாக இருக்கும் இந்த இடம், கடந்த கால சுதந்திரப் போராட்ட வரலாற்றின் வலியை அழுத்தமாகச் சொல்கிறது.

தொடர்புக்கு: ஆம்பூர் மங்கையர்கரசி,
mangai.teach@gmail.com
Courtesy: தி இந்து, தேதி: 20.12.2017

திறமை என்பது கடவுளால் கொடுக்கப்பட்டது – அடக்கத்துடன் இருங்கள்
புகழ் என்பது மனிதரால் கொடுக்கப்பட்டது – நன்றியுடன் இருங்கள்
அகம்பாவம் என்பது நமக்கு நாமே கொடுத்துக் கொண்டது – எச்சரிக்கையுடன் இருங்கள்

TIRUKKURAL AND MANAGEMENT IN A 'NUTSHELL' - 66

Tirukkural deals extensively and comprehensively, with the various attributes and characteristics for every person for leading a proper, good and useful life in this world. Continuing with the task of identifying people for positions or to lead us in the Democratic set up, there are many more important characteristics to look into and another important one is the concern to do good to society and the people at large and the fear of 'Evil doing'. Valluvar stresses elsewhere that though 'Fearlessness' is good, but one should fear what is to be feared. Evil doing is one such, which is to be feared and he devotes a number of Kurals dealing with this. Fairness in thoughts and action is stressed and abstaining from evil doing resulting in harm for anyone, even the enemy, is what is prescribed. Let us see some of the Kurals bringing out these points and identifying persons of worth.

TheeyavaiTheeyaPayaththalalTheeyavai TheeyinumAnjapPadumKural 202

தீயவைதீயபயத்தலால் தீயவை
தீயினும் அஞ்சப் படும்.குறள் 202

"Evil bringeth forth evil; evil therefore is to be feared even more than fire"

"MaranthumPirankeduSoozharkkaSoozhin AramsoozhumSoozhnthavanKeduKural 204

மறந்தும் பிறன்கேடு சூழற்க சூழின்
அறம்சூழும் சூழ்ந்தவன் கேடு குறள் 204

"Let not a man compass another's ruin even unthinkingly; for justice will compass the ruin of him that plotteth evil"

ArivinulEllamThalaienbaTheeya SeruvarkkumSeyyaa Vidal Kural 203

அறிவினுள் எல்லாம் தலையென்பதீய
செறுவார்க்கும் செய்யாவிடல் குறள் 203

"The Chiefest wisdom, they say, is obstain from injury even to an enemy"

ArungkedanEnbathuArigaMarungodith TheevinaiSeyyaanEninKural 210

அருங்கேடன் என்பதுஅறிகமருங்கோடித்
தீவினைசெய்யான் எனின். குறள் 210

"Know that man to be secure from ills who leaveth not the straight path in order to commit wrong"

HOME FESTIVALS - 11

கார்த்திகை - Karttikai (November/December)

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

(To be continued)

WORLD'S FIRST OCEAN-GOING SOLAR YACHT COULD CRUISE INDEFINITELY – IF YOU TAKE IT SLOW - CONCEPT

It's quick, it's quiet, and it's covered in 300 square meters (3,229 sqft) of solar panels. The 78-ft (24-m) electric SolarImpact yacht is a concept designed as the first of its kind – an ocean-going solar-powered yacht. An 800-kWh battery on board gives it 10 hours of cruising capability, which can be extended by topping up the battery when the Sun's shining.

The yacht's giant solar array, which covers the vast majority of its upward-facing surfaces, can generate up to 320 kWh a day if they're getting lots of sun. They can serve as the vessel's sole power source if conditions allow, and you're prepared to take your time.

Although this 70-ton aluminum-hulled beast boasts 1,000 kW (1,341 hp) of all-electric power and has an impressive maximum speed of 22 knots, if you're running all the regular systems solely on solar, you will be able to cruise indefinitely, but only at a slow 5 knots – which would take you around the world in about six months if there wasn't a whole lot of land in the way. Speed it up and the battery will run down.

By comparison, a regular yacht of a similar size would burn some 100 litres (26 gal) of fuel an hour at a 10-knot cruise, a number that would cause the average 80-ft yacht owner exactly zero distress, but to the degree a large yacht can be eco-friendly, this one is.

We say large yacht instead of superyacht because the SolarImpact falls an inch or two short of the 79-ft (24-m) cutoff point above which certain countries mandate you need to have a permanent crew on board.

Should the Sun not shine upon your voyage, there's a pair of 65-kW (87-hp) range-extending diesel engines on board as a backup. And the drive systems are automated, apparently using some sort of AI assistance, to the point where a single person can maneuver it. Certainly, the helm looks pretty simple for something of this size.

The SolarImpact also has an interesting stabilizing technology rolled in – twin torpedo-shaped buoyancy hulls under the water surface that the company says reduce side-to-side rolling by as much as 90 percent, making it comfortable even when the waves are high. The interior is about as fancy as you'd expect, with reasonably luxurious accommodations for 10 guests and a crew of one.

The concept was unveiled at last week's Cannes Yachting Festival, including a full 3D model for potential buyers to explore the vessel virtual reality.

FAMILY GET-TOGETHER PHOTOS
OOTY - 4, 5 & 6 MAY 2018


Family Get-Together


Family Get-Together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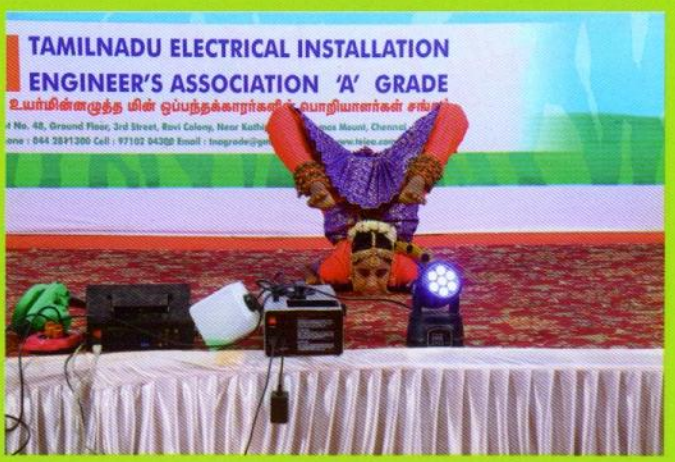
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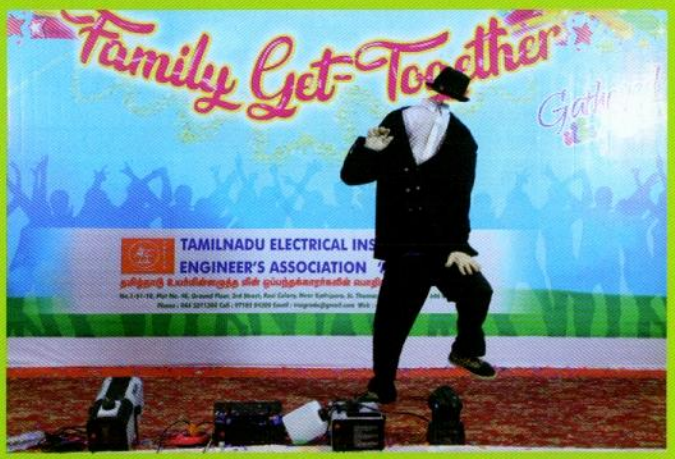
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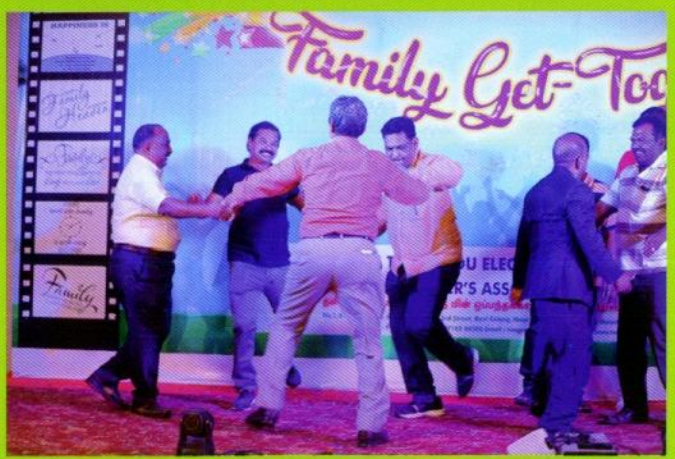
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