



ELECTRICAL

INSTALLATION ENGINEER

NEWS LETTER

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

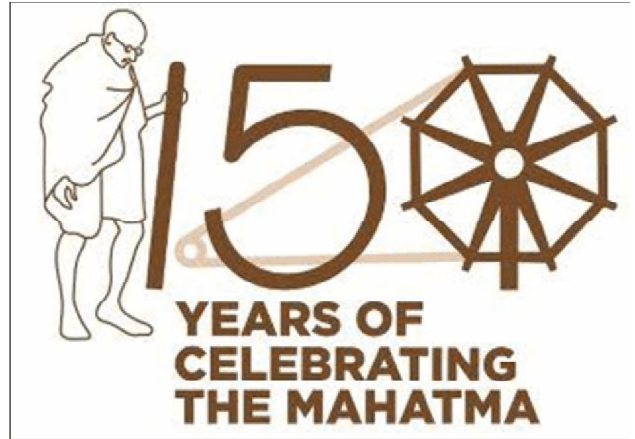
Dear Members, Fellow Professionals and Friends,

Seasons Greetings To One And All!

Greetings For A Happy Ayudha Pooja Day!!

Greetings For Happy Deepavali!!!

The most important event of October 2019 is the celebration of 151st Birthday of Mahatma Gandhi the world over. He was truly the Mahatma and the Father of The Nation whose memory always lived and guided the Nation, though he never held any office either in the party or in the government till his passing away in 1948. He firmly believed in Sathya and Ahimsa and harmony in what you think, what you say, and what you do and practiced these meticulously all his life. These were actually his strengths with which he could get all the people of India to follow him in full strength and help conduct the freedom struggle very successfully and



set an example to the whole world. He loved all the people of India without any difference and firmly believed in survival of the weakest, which in essence, in today's contemporary thinking process means 'inclusive'. He set out, from the grass root level to fulfill the need of every one and he proclaimed that there are enough resources to fulfill every one's need but not the greed. The same concept has been reflected by the Prime Minister of India in the recent Environmental Congress in the US, when he has said that India will work on Renewable Energy to fulfill all the needs but not the greed. Mahatma Gandhi believed in simplicity and living in harmony with nature which are considered of great value and importance today when the very safety of the world is being threatened due to abnormal rise of energy needs and unpardonable levels of use of FOSSILS to meet the energy needs. He firmly believed and advocated Ethics in Business and today in the world at large 'Ethics', apart from integrity and other values, include concern for the Environment and society at large. In a recent Business Conclave, when they were discussing about the current economy and so on, one expert remarked that things will improve and the coming Deepavali will not only be Bright but also will be Green. Let us all resolve to make all our activities focus on 'Green' in everything.

Navarathri and Ayudha Pooja are celebrated in different forms all over the country this month and in Tamilnadu, Ayudha Pooja represents our total faith and reverence to "Work is Worship". We can see very elaborate worship of Tools and Machines and work place by everyone involved in any kind of work in all kinds of work places. It will be interesting to know that Navarathri indeed is worship of Goddesses of Knowledge and Skill, Business and Wealth and Power and Valor, representing all activities of the society and the country at large.

We thank all those members who have helped us by participating in the advertisement appearing for the issue Sep 2019 – Galaxy Earthing Electrodes Pvt. Ltd., Indo Swiss, Power Cable Corporation, Power Square Engineers (Indotech Transformers Ltd.), Ringlet, Supreme Power Equipment Pvt. Ltd., Visewham Electricals, Wilson Power and Distribution Tech P. Ltd.

EDITOR

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EDITORS' DESK

Date: 21.09.19

To

The Members,
TNEIEA

Dear Friends

Our association has been thriving to get the TN Licensing board membership for the past couple of years. There was a delay in getting membership due to the hurdles faced by our association regarding renewal. With the efforts of the office bearers, we have finally sorted out all the renewal issues and our Association has become fully operational.

Our Association expresses our profound gratitude to Honorable Minister for Handlooms and Textiles Thiru O.S. Manian and Honorable Minister for Electricity, Prohibition and Excise Thiru P.Thangamani.

Without their support , we would not have got our registration issue sorted and Membership with TN Licencing Board.

At this juncture, TNEIEA would like to thank our Chief Electrical Inspectorate to Govt, Mr. Ilamporunan, for all his support towards Licensing board membership.

Last but not least , TNEIEA extends its special thanks to our President, Mr. S.D. Poongundran for his excellent effort in sorting out the Registration issues and getting the TN Licencing Board membership for our association.

Every member of our association should be proud of these achievements and request your support to the association in the future.

Thank You

Editor & Office bearers

TNEIEA



சுருக்கம்

மின் உரிமம் வழங்கும் வாரியம் - தமிழ்நாடு உயர் மின்னழுத்த மின் ஒப்பந்தக்காரர்களின் பொறியாளர்கள் சங்கம் (ஏ கிரேடு) (Tamil Nadu Electrical Installation Engineers' Association 'A' Grade) சார்பாக அதன் தலைவர் திரு. S.D. பூங்குன்றன் அவர்களை மின் உரிமம் வழங்கும் வாரியத்தில் உறுப்பினராக நியமனம் செய்தல் - ஆணை வெளியிடப்படுகிறது.

எரிசக்தி(டி2)த் துறை

அரசாணை(வாலாயம்) எண்.213

நாள் : 09.09.2019

திருவள்ளூர் ஆண்டு 2050

விகாரி , ஆவணி 23

படிக்க:

- 1) அரசாணை (வாலாயம்) எண்.158, எரிசக்தி(டி2)த் துறை, நாள் 13.06.2016.
- 2) அரசு தலைமை மின் ஆய்வாளர் மற்றும் தலைவர், மின் உரிமம் வழங்கும் வாரியம், கடித எண்.853/மி.உ.வா./இ.ஏ மி.ஒ.ச/க.கா.02/2016, நாள் 19.10.2016
- 3) அரசு தலைமை மின் ஆய்வாளர் மற்றும் தலைவர், மின் உரிமம் வழங்கும் வாரியம், கடித எண்.3101/மி.உ.வா./இ.ஏ கிரேடு/க.கா.1/2019, நாள் 4.4.2019 மற்றும் 19.8.2019.

ஆணை :

மேலே முதலாவதாகப் படிக்கப்பட்ட அரசாணையில், திரு.உ.பாஸ்கரன் அவர்களை தமிழ்நாடு உயர் மின்னழுத்த மின் ஒப்பந்தக்காரர்களின் பொறியாளர்கள் சங்கம் (ஏ கிரேடு) (Tamil Nadu Electrical Installation Engineers' Association 'A' Grade) சங்கத்தின் சார்பாக மின் உரிமம் வழங்கும் வாரியக் குழு உறுப்பினராக 13.07.2016 அன்று நியமனம் செய்து ஆணை வெளியிடப்பட்டது. மேற்சொன்ன சங்கத்தின் சார்பாக நியமனம் செய்யப்பட்ட உறுப்பினரின் சங்க பதவிக்காலம் முடிவுற்றதைத் தொடர்ந்து, அவர் வசித்து வந்த மின் உரிமம் வழங்கும் வாரிய உறுப்பினர் பதவியை 22.08.2016 அன்று ராஜினாமா செய்துவிட்டதாகவும் தெரிவித்துள்ளார்.

2. மேலே படிக்கப்பட்ட கடிதம் 2 மற்றும் 3ல் கண்ட அரசு தலைமை மின் ஆய்வாளர் மற்றும் தலைவர், மின் உரிமம் வழங்கும் வாரியம் அவர்களின் பரிந்துரையை அரசு கவனமுடன் பரிசீலனை செய்த பின், அரசாணை (நிலை) எண்.1704, பொதுப்பணித் துறை, நாள் 1.7.1986-இல் வெளியிடப்பட்டுள்ள ஆணைகளின் அடிப்படையில் திரு. S.D. பூங்குன்றன், தலைவர், தமிழ்நாடு உயர் மின்னழுத்த மின் ஒப்பந்தக்காரர்களின் பொறியாளர்கள் சங்கம் (ஏ கிரேடு), அவர்களை அவரது சங்கத் தலைவர் பதவிக்காலம்

(த.பி.பா)

முடியும் வரை அல்லது இவ்வாணை வெளியிடும் நாள் முதல் இரண்டாண்டு காலம் இவற்றில் எது முன்னர் நிகழ்கிறதோ அதுவரை, தமிழ்நாடு மின் உரிமம் வழங்கும் வாரியத்தில் உறுப்பினராக நியமனம் செய்து அரசு ஆணையிடுகிறது.

(ஆளுநரின் ஆணைப்படி)

முகமது நசிமுத்தின்
அரசு முதன்மைச் செயலாளர்

பெறுநர்

அரசு தலைமை மின் ஆய்வாளர் மற்றும் தலைவர்,
மின் உரிமம் வழங்கும் வாரியம், கிண்டி, சென்னை-32.

திரு. S.D. பூங்குன்றன், தலைவர்,

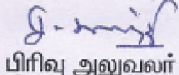
தமிழ்நாடு உயர்மின்னழுத்த மின் ஒப்பந்தக்காரர்களின் பொறியாளர்கள் சங்கம் (ஏ கிரேடு),
(Tamil Nadu Electrical Installation Engineers' Association 'A' Grade)

எண்.1/61-10, பிளாட் எண்.48, 3வது தெரு, ரவி காலனி,
ஜெயின்ட் தாமஸ் மெளண்ட், சென்னை -600 016.

நகல்

இருப்பு கோப்பு/ உபரி.

//ஆணைப்படி அனுப்பப்படுகிறது//


பிரிவு அலுவலர்

MODI TO INAUGURATE ‘GANDHI SOLAR PARK’ INDIA’S GIFT TO THE UN HEADQUARTERS

New York: In a first-of-its-kind symbolic effort by India at the UN, Prime Minister Narendra Modi will inaugurate a 50KW ‘Gandhi Solar Park’ next week during his visit to the world organisation, a gesture that highlights India’s willingness to go beyond the talk on climate change.



At a contribution of about one million dollars, India has gifted solar panels that have been installed on the roof of the UN Headquarters here, one panel each for every 193 UN Member State.

Modi will remotely inaugurate the solar park at the UN Headquarters and the ‘Gandhi Peace Garden’ during a special commemorative event on September 24 marking Gandhi’s 150th birth anniversary. On the occasion, a special UN Postage on Gandhi’s 150 years will also be released.

The ‘Gandhi Peace Garden’ is an innovative initiative under which the Consulate General of India in New York, Long Island-based NGO Shanti Fund and the State University of New York - Old Westbury have entered into an agreement to plant 150 trees.

The garden is dedicated in the memory of Gandhi and is a crowdsourced project, with people adopting trees in the memory of their loved ones. The garden is in an open site within the 600 acres campus of the University.

India’s Permanent Representative to the UN Ambassador Syed Akbaruddin told reporters here Thursday that the country’s engagement during the high level UN General Assembly session will be action-oriented and with visible outcomes and the Solar Park is an example of that.

“Never has there been a symbolic Indian effort at the UN, of a tangible nature, which impacts on every country of the type that the Gandhi Solar Park is going to be. The UN always talks about renewable energy, it always talks about climate action, climate change. By this small effort that we’ve made, we symbolise our willingness to go beyond the talk.”

The solar panels are powered up to reach the max of 50 KW of generation power.

Akbaruddin said energy generated in the park is equivalent to energy that would have been created through use of 30,000 kilograms of coal. It also has a carbon sequestration of 1000 seedlings which will grow into trees over 10 years.

“It is a first attempt. It is an effort where we reflect all 193 countries because there are 193 panels there. Each one for one country, we not only believe in solar power, but we believe in equality too.”

Further, in a new element in India’s engagement with the UN, Modi will host a special event ‘Leadership Matters: Relevance of Gandhi in the Contemporary World’ on September 24 in the Economic and Social Council (ECOSOC) Chamber in the UN Headquarters, in commemoration of the 150th anniversary of Mahatma Gandhi.

“For the first time we are having an Indian icon celebrated at the UN. The idea is that to try and contextualise Gandhi’s approach in a more broad, international context of today. So it will be focused on leadership matters.”

UN Secretary General Antonio Guterres, President of South Korea Moon Jae-in, Singapore Prime Minister M Lee Hsien Loong, Bangladesh Prime Minister Sheikh Hasina, Jamaican Prime Minister Andrew Holness and New Zealand Prime Minister Jacinda Ardern will address the special event and speak on their leadership challenges and how in the contemporary world, Gandhi’s values have inspired each of them in challenges they have faced in their political lives, when they were in office or outside office as leaders.

Akbaruddin said these leaders from diverse geographies will speak on Gandhi’s leadership and relevance of Gandhian approach and values in the contemporary world. Modi will also be presented with the 2019 ‘Global Goalkeeper Award’ by the Bill and Melinda Gates Foundation on September 24.

The honour is a “special recognition” that celebrates a political leader who has “demonstrated their commitment to the Global Goals through impactful work in their country and/or globally.”

Modi will be honoured for his leadership of the Swachh Bharat Mission, which he had launched on October 2, 2014. The ambitious mission aims to accelerate the efforts to achieve universal sanitation coverage in the country by this year as a tribute to Mahatma Gandhi on his 150th birth anniversary.

So far, 90 million toilets have been built to eliminate open defecation by October 2, 2019 and currently 98 per cent of India’s villages have rural sanitation coverage instead of 38 per cent four years ago.

BENEFITS OF SLEEPING ON YOUR LEFT SIDE

In Ayurveda it is called Vamkushi.

- | | |
|--|--|
| 1. Prevents snoring | 8. Helps in smooth bowel movements |
| 2. Helps in better blood circulation | 9. Reduces workload on heart and its proper functioning |
| 3. Helps in proper digestion after meals | 10. Prevents acidity and heartburn |
| 4. Gives relief to people having back and neck pain | 11. Prevents fatigue during morning |
| 5. Helps in filtering and purifying toxins, lymph fluids and wastes | 12. Fats gets digested easily |
| 6. Prevents serious illness as accumulated toxins are flushed out easily | 13. Positive impact on brain |
| 7. Liver and kidneys work better | 14. It delays onset of Parkinsons and Alzheimers |
| | 15. It is also considered to be the best sleeping position according to Ayurveda |

“If I have the belief that I can do it, I shall surely acquire the capacity to do it even if I may not have it at the beginning.” – MAHATHMA GANDHI

KNOW THY POWER NETWORK - 145

Some more elaborations on Trade Off topics.

Every issue has its own positive and negative aspects. We have to weigh them carefully, with a cost focus before arriving at a balanced decision.

Let us move further.

i. Technical

1. Percentage Impedance of Transformers Employed in a Power Delivery System should be high or low.

During earlier days when the generation capacity is low and loads are scattered long distribution lines were needed to feed the loads with an acceptable voltage drop. To meet this requirement, transformers (Power and Distribution Transformers) with low percentage impedance (2-5 Percentage) were employed. Presently there is a phenomenal growth in the generation capacity of the power sector and loads are also concentrated. Further because of very high generation in the grid, the short circuit level or in the fault level also attains significantly high level in the order of several “Giga VA” or “several thousand MVA”. This results in very heavy damage during fault occurring closer to the substation. This brings an urgent need to limit this short circuit current to avert damages to the equipment and other components in the Power Network to meet this requirement transformers higher percentage impedance are used. A detailed analysis of this issue is given below

Transformer with higher Percentage Impedance	Transformer with lower Percentage Impedance
<ul style="list-style-type: none"> – High cost – Higher voltage drop and hence higher losses – Fault level at the transformer terminals is comparatively low. SC Current = [100 (percentage impedances) x rated current of the transformer] – When operated in parallel its load sharing is comparatively less 	<ul style="list-style-type: none"> – Moderate cost – Lower voltage drop and lower losses – Very high fault level; when faults occur at the terminals of the transformer. – Load sharing is comparatively high – Vulnerable to ferro resonance phenomena with the consequential failure.

Final View

The capacity to limit the dangerous Short Circuit Currents clinches the decision in favour of transformer with higher percentage impedances.

2. For water pumping works in the agricultural sector, should we go for pumps with single phase or three phase induction motor?

Single Phase Pump Motor	Three Phase Pump Motor
<i>Positive Aspects</i>	<i>Positive Aspects</i>
<ul style="list-style-type: none"> – Installation and operation costs are comparatively less; power delivery system is simple. – Essence of capacitors in the motors help the required flow of VARS and hence higher power factor operation is achieved. 	<ul style="list-style-type: none"> – Higher efficiency and smooth running
<i>Negative Aspects</i>	<i>Negative Aspects</i>
<ul style="list-style-type: none"> – Lower efficiency – Higher losses 	<ul style="list-style-type: none"> – Cost is high – Power factor is low – Additional VAR compensation arrangements or needed. Single phasing often creates heating problems and leads to major damages. Four wire distribution is required for its operation.

Final View

The balance is tilted in favour of single phase Motor Pump sets due to its lower cost and higher Power Factor operation.

3. Protective Surge Arresters for Transformers – should it have low or optimum protection level?

Arrester with Optimum Protective Level	Arrester with Low Protective Level
<ul style="list-style-type: none">– Arresters are employed as second line of defence against over voltage surges like lightning and switching surge.– Transformer are expected to protect themselves against loop level surges this reduces the burden on the arrester; so it wards off the need for the frequent replacement of arresters.– Increases the life span of arresters.– A less costly process.– Frequent encounters with low level voltage surges may impact the insulation of the transformer in the long run.	<ul style="list-style-type: none">– In this case, the arresters are used at first line of defence i.e. the arrester will sacrifice its life, when severe over voltage surges enter the circuit.– The transformer is well protected against all kinds of voltage surges.– As the arrester operation is ensured under all types of surges, its life is very much restricted (arrester life span – 20 surges).– Frequent replacement of arresters is required. The transformer insulation level (BIL) can be kept low. It leads to the reduction in transformer investment cost and the insulation level of the station.– A costly process.

The main issue focused in this case is the replacement costs of transformer and the protective arrester that includes cost of downtime. When we want to protect the transformer, especially the one which is critical for the plant at any cost, then we have to go for the second option viz. use of arrester with low proactive level (“First Line of Defence”) when we don’t want to lose the transformer and the arrester as well (due to multiplicity of reasons) there is a need to go for the second option i.e the arrester with optimum protective level (the use of surge arresters of second life of defence with less costs).

4. Should we go for Nuclear Batteries with infinite life or Smart Cells?

Batteries based on Nuclear Material	Smart Cells
<p><i>Positive Aspects</i></p> <ul style="list-style-type: none">– Infinite life– No need for recharging.– Aluminium foil is provided for protection.– Ensures continued operation of the devices. <p><i>Negative Effects</i></p> <ul style="list-style-type: none">– <i>Emits dreadful radiation.</i>– <i>Cost is high.</i>	<p><i>Positive Aspects</i></p> <ul style="list-style-type: none">– Cost is less.– No special protection is required.– Do not emit any radiation. <p><i>Negative Aspects</i></p> <ul style="list-style-type: none">– Frequent recharging is required.– Life is limited

On viewing from the “Health Hazards”, Smart Cells are preferred over Nuclear Material based Cells i.e. the hidden danger of Nuclear Battery clinch this deals in favour of Smart cell, through these are required to be charged frequently, a known cumbersome process.

***“I object to violence because when it appears to do good,
the good is only temporary; the evil it does is permanent.”***

– MAHATHMA GANDHI

5. Mobile phone apps – useful or harmful

Presently mobile phone apps are released in thousands; specially cater to our every need. Among them is a deluge of delivery apps that ensure we need not step out/get off our premises for anything. Let us discuss now whether it is useful or harmful.

Useful	Harmful
<ul style="list-style-type: none"> – Highly useful for busy people who are hard-pressed for time. – Provides the convenience of getting every item of need at our door steps without moving from premises/residence. 	<ul style="list-style-type: none"> – Reduces all our physical activities; make us lazy. – A health hazard; brings many health problems for want of exercise. – Costs of the ordered items are comparatively high; at time the quality is also not at the desired level. – In case of food items, the delivered food is not hot. – our lack of time is encashed by the suppliers. – Impaires our logical thinking and it my land us in unexpected problems.

The main deficit of this system V/2 it “breeds laziness” cannot be brushed aside and it needs focused attention. Actually it works against its wide spread application. To sum it up, it can be stated that one pays a price for using this kind of Smart devices viz. obesity and its attendant health problem.

ii. General/common (non-technical) topic

As a small deviation, let us see how this Trade Off concept works on common issues.

6. Work vs Life

It is common that the professional people find it difficult to balance their work and life situations and treat them as “seperate issues” and struggle to bring them into balance. Actually these are the parts of the same life system, just like “voltage and current in an electrical energy system”. They are not “opposite”; only the roles they play are different. How we look at/get on to these issues, favours final decision. This demands us to view its various dimensions before evaluating them in the light of Trade Off Concept.

Work (Professional Life)	Life (Personel Activity)
<ul style="list-style-type: none"> – Modern Technical devices and the market oriented compatitive environment create a pressure cooker enviornment where burnout, highly stressful and unhappy situations are common. i.e. work is treated as the fountain head/origin of all these situations. 	<ul style="list-style-type: none"> – It is the time assigned for family. – Flexible working hours and work at home option may save this stressful condition and bring some comforts in our personel life structure. – Mental peace is brought, when we find some time amidst our works to meet our personel works. – Failure to give some focus to our personel life may bring (gloomy) situation.

To find amicable solution for work-life problem, the suggested measures are,

- Integrate work and life; dont treat them as separate issues.
- Balance the heaviness of work with the lightness of personel life since we normally lose our self in work but find our self in life.

Let me sign off here. Till then, please stay tuned.

(To be continued...)



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ENGINEERS CREATE TUNABLE, NANOSCALE, INCANDESCENT LIGHT SOURCE

What may be viewed as the world's smallest incandescent lightbulb is shining in a Rice University engineering laboratory with the promise of advances in sensing, photonics and perhaps computing platforms beyond the limitations of silicon. Gururaj Naik of Rice's Brown School of Engineering and graduate student Chloe Doiron have assembled unconventional "selective thermal emitters" — collections of near-nanoscale materials that absorb heat and emit light.

Their research, reported in *Advanced Materials*, one-ups a recent technique developed by the lab that uses carbon nanotubes to channel heat from mid-infrared radiation to improve the efficiency of solar energy systems.

The new strategy combines several known phenomena into a unique configuration that also turns heat into light — but in this case, the system is highly configurable. Basically, Naik said, the researchers made an incandescent light source by breaking down a one-element system — the glowing filament in a bulb — into two or more subunits. Mixing and matching the subunits could give the system a variety of capabilities.

"The previous paper was all about making solar cells more efficient," said Naik, an assistant professor of electrical and computer engineering. "This time, the breakthrough is more in the science than the application. Basically, our goal was to build a nanoscale thermal light source with specific properties, like emitting at a certain wavelength or emitting extremely bright or new thermal light states.

"Previously, people thought of a light source as just one element and tried to get the best out of it," he said. "But we break the source into many tiny elements. We put sub-elements together in such a fashion that they interact with each other. One element may give brightness; the next element could be tuned to provide wavelength specificity. We share the burden among many small parts.

"The idea is to rely upon collective behavior, not just a single element," Naik said. "Breaking the filament into many pieces gives us more degrees of freedom to design the functionality."

The system relies on non-Hermitian physics, a quantum mechanical way to describe "open" systems that dissipate energy — in this case, heat — rather than retain it. In their experiments, Naik and Doiron combined two kinds of near-nanoscale passive oscillators that are electromagnetically coupled when heated to about 700 degrees Celsius. When the metallic oscillator emitted thermal light, it triggered the coupled silicon disk to store the light and release in the desired manner, Naik said.

The light-emitting resonator's output, Doiron said, can be controlled by damping the lossy resonator or by controlling the level of coupling through a third element between the resonators. "Brightness and the selectivity trade off," she said. "Semiconductors give you a high selectivity but low brightness, while metals give you very bright emission but low selectivity. Just by coupling these elements, we can get the best of both worlds."

"The potential scientific impact is that we can do this not just with two elements, but many more," Naik said. "The physics would not change." He noted that though commercial incandescent bulbs have given way to LEDs for their energy efficiency, incandescent lamps are still the only practical means to produce infrared light. "Infrared detection and sensing both rely on these sources," Naik said. "What we've created is a new way to build light sources that are bright, directional and emit light in specific states and wavelengths, including infrared." The opportunities for sensing lie at the system's "exceptional point," he said.

"There's an optical phase transition because of how we've coupled these two resonators," Naik said. "Where this happens is called the exceptional point, because it's exceptionally sensitive to any perturbation around it. That makes these devices suitable for sensors. There are sensors with microscale optics, but nothing has been shown in devices that employ nanophotonics."

The opportunities may also be great for next-level classical computing. "The International Roadmap for Semiconductor Technology (ITRS) understands that semiconductor technology is reaching saturation and they're thinking about what next-generation switches will replace silicon transistors," Naik said. "ITRS has predicted that will be an optical switch, and that it will use the concept of parity-time symmetry, as we do here, because the switch has to be unidirectional. It sends light in the direction we want, and none comes back, like a diode for light instead of electricity."

GEGADYNE BATTERIES CAN CHARGE EVS IN 15 MINUTES

The new technology combines the quick charging capability of supercapacitors with the high energy density of conventional batteries

Founded in 2015, Gegadyne energy is developing a proprietary Battery Technology that can charge from 0-100% under 15 mins all of this while compiling to highest safety standards compared to any existing battery technology across the globe.



Mumbai-based Gegadyne Energy is a startup that is riding NITI Aayog's Electric Vehicle Mission 2030, which states that India can create a \$300 billion domestic market for EV batteries by 2030. Gegadyne is making its proprietary battery technology for EVs, and is readying for a commercial rollout in early 2020. Its current prototype has a capacity of 1 kWh.

The company claims that this technology will 'revolutionize the energy sector worldwide', and has the potential to make India an 'energy powerhouse'.

Founded by Jubin Varghese and Ameya Gadiwan, two college dropouts, the company has created a portfolio of International Patents to build an ecosystem of Electric Vehicles and Stationary Energy Storage. The company has developed high energy density super-capacitors with energy density similar to Lithium Ion batteries .

The concept originated back in 2014, when two mechanical and electronics engineering students, were inspired by the launch of Tesla's Model X and Model S cars. Jubin was a car enthusiast; Ameya was into hard technology. They wanted to make their very own EV.

They went about collecting spare parts from Mumbai's junkyards but hit a roadblock when they realized the battery required to power the EV was 3 times more expensive than the entire cost of building it.

They began with lead-acid batteries, which were cheap but took almost forever to charge. Then, they switched to lithium-ion batteries (typically used in EVs), which were quick to charge, but lost some battery life with every charging cycle. "That is when we stumbled upon supercapacitors, which already existed in the market," Founder-CEO Jubin says.

The founders enhanced the performance of supercapacitors by mixing graphene, composite nanomaterials and Artificial Atoms – quantum physics, basically. They managed to increase the energy density of the batteries, and bring down the discharge rate. Today, this tech forms the core of what Gegadyne does.

Gegadyne also offers a range of products and services related to energy storage, including battery packs, individual cells along with battery management systems and auxiliary analytics solutions. Essentially, it is building an entire energy ecosystem around EVs, which is expected to take off by 2021-2022.

The startup's vision is a future where EV owners could drive their Electric cars to a charging station with less than 1% of battery and drive out of the same within 15 minutes with a fully charged batteries. The experience of the Electrical Vehicle owner should be exactly like fueling at a petrol pump.

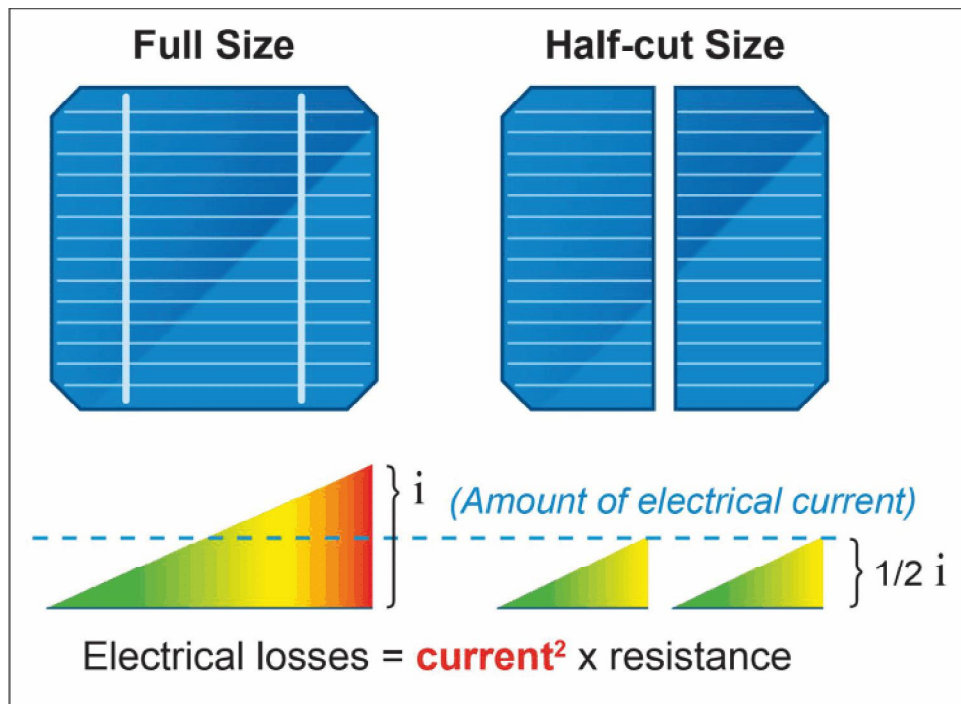
HALF-CUT SOLAR CELLS: AN OVERVIEW

What are half-cut solar cells?

Just as bifacial solar panels and PERC solar cells provide small boosts in the efficiencies of silicon solar panels, implementing half-cut cells in solar panels can help improve the power output of a solar panel system. Half-cut solar cells are exactly what their name suggests – they are traditional silicon solar cells that have been cut in half using a laser cutter.

Half-cut cells provide several benefits over traditional solar cells. Most importantly, half-cut solar cells offer improved performance and durability. Performance-wise, half-cut cells can increase panel efficiencies by a few percentage points. And in addition to better production numbers, half-cut cells are more physically durable than their traditional counterparts; because they are smaller in size, they're more resistant to cracking.

Due to these advantages, solar panels built with half-cut solar cells have the potential to provide quicker solar payback periods for property owners installing solar energy systems. Especially for installations where shading and limited space are constraining factors, half-cut cells can make a solar panel installation even more worth the upfront cost.



How do half-cut solar cells improve panel performance?

There are a few main ways that half-cut cells can boost solar panel output and performance:

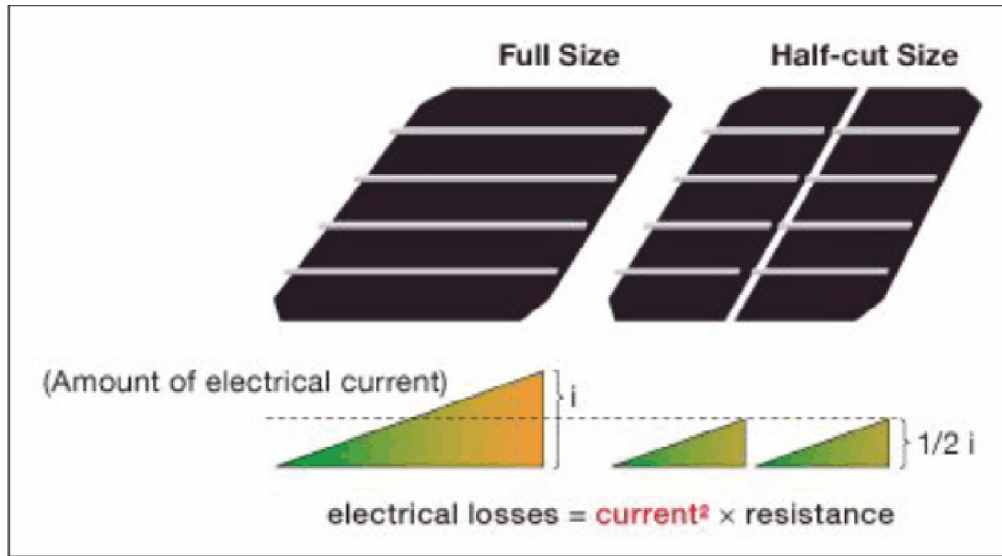
1. Reduced resistive losses

One source of power loss when solar cells convert sunlight into electricity is resistive losses, or power lost during electrical current transport. Solar cells transport current using the thin metal ribbons that cross their surface and connect them to neighboring wires and cells, and moving current through these ribbons leads to some energy lost. By cutting solar cells in half, the current generated from each cell is halved, and lower current flowing leads to lower resistive losses as electricity moves throughout cells and wires in a solar panel.

2. Higher shade tolerance

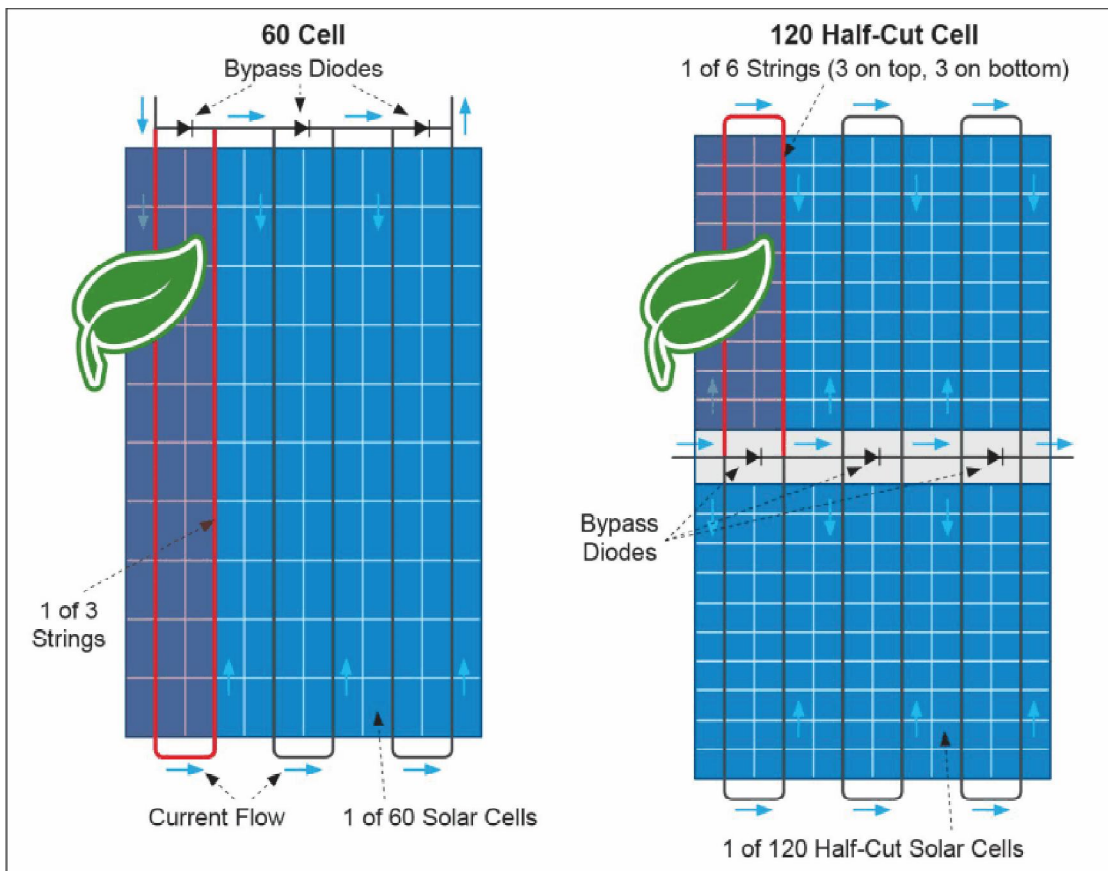
Half-cut cells are more resistant to the effects of shade than traditional solar cells. This is not due to the cells being cut in half, but rather a result of the wiring methods used to connect half-cut cells in a panel. In traditional

solar panels built with full cells, the cells are wired together in rows, known as series wiring. In series wiring schemes, if one cell in a row is shaded and not producing energy, the entire row of cells will stop producing power. Standard panels typically have 3 separate rows of cells wired together, so shade on one cell of one row would eliminate a third of that panel's power production.



Half-cut cells are also wired in series, but because panels made with half-cut cells have double the number of cells (120 instead of 60), there are also double the number of separate rows of cells. This type of wiring allows panels built with half-cut cells to lose less power when a single cell is shaded because a single shaded cell can only eliminate a sixth of the total panel power output.

What solar panel manufacturers use half-cut cells?



The first half-cut cell solar panels were introduced in 2014 by REC Solar, and they have since been transferring much of their module manufacturing to be equipped for half-cut cell production. Aside from REC, many manufacturers have introduced half-cell modules. Trina Solar, Hanwha Q CELLS, JinkoSolar, and LONGi Solar are just some of the large solar panel manufacturers who produce half-cell panel options.

Solar manufacturers can transition to half-cell production

Half-cut cell production lines are not much different from traditional solar cell lines, and any panel manufacturer looking to begin making half-cut cells doesn't need to completely overhaul existing factories or production processes. There are two additional steps needed when making half-cut cells: a cell cutting step and a stringing step.

Cell cutting is done with a laser and involves splitting standard solar cells into two halves. Solar cells can be very fragile, and laser cutting allows for precise lines to be cut into solar cells.

As with cell cutting, the stringing process needed when making half-cut cells is a very precise task. Stringing is the process of placing the conductive strips, known as busbars, on each half-cut cell. Due to the smaller size of half-cut cells, the busbars used are smaller and require specialized equipment to accurately place them.

Find the right solar panels for your installation

Half-cut solar cells are an exciting technology in the solar industry and can be a solution for property owners looking to maximize energy production with high-efficiency, shade-tolerant solar panels. In order to find the best solar system option for you at the right price, register your property on the EnergySage Solar Marketplace to begin receiving custom solar quotes submitted by local solar companies. If you are interested in solar panels made with half-cut solar cells, you can simply leave a note on your profile for installers to see. Not all solar panel manufacturers use half-cut cell technology, but certain installers may carry half-cut panels.

INNOVATIVE DEVICE HARNESSSES HEAT AT NIGHT

New device generates electricity from darkness.

Winter is fast approaching, days are getting shorter, nights are getting colder. It is inevitable that even the most eco-conscious among us start thinking a bit more about staying warm and cosy.

A team of scientists from Stanford University, took on a quest to explore unconventional ways to generate electricity, which can green up the long nights. They tapped into something that everyone shines away from- the darkness.

The process the team based their concept on is called radiative cooling. Their invention was designed to harness the energy, which the Earth sends back to the atmosphere in the form of reflected thermal radiation. Essentially, this is the exact opposite process of what solar cells are based on.

The team designed a system, which consists of black aluminium disks (each 20 centimetre wide), which are connected to regular thermoelectricity generators. The disks act as emitters of radiation. When the heat is emitted from the surface of the Earth to the air it reaches the thermoelectricity generators and hits the disks. The system was able to produce the impressive 25 milliwatts per square meter of the disk at night. This is roughly sufficient to power an LED. What is even better, the device can act in reverse manner, and harness the energy from the sun during the day.

The scientists point out that the device can be optimized further, easily producing 0.5 watts per square meter of disk in drier environments, or with better insulation.

Although compared to solar cells, the amount is quite minimal, the potential of such system is great. Imagine what a difference something like this could make in a remote area in Africa, where energy storage is a luxury, while lights at night are more than necessary. Aaswath Raman, an assistant professor of materials science and engineering at the University of California, and lead author of the study, points out that the system is very cheap and can definitely serve as a great backup when solar panels are not able to produce energy.

RENAULT PLANNING TO LAUNCH BUDGET-FRIENDLY KWID ELECTRIC IN INDIA

Renault is set to launch its Kwid EV that could fill the gap for an affordable, functional and aesthetic electric car in India.



French carmaker Renault is bringing a new electric hatchback. Renault Kwid EV has already been launched in China as City K-ZE, and it costs less than \$8,700 (Rs. 6,23,000). Its relatively cheap entry price is partly due to the fact that it was designed by Renault and its Chinese JV partner Dongfeng.

The price for India should be less or equal to Rs 10 lakh including other charges and taxes. The prices may come down a little as the government has given many tax sops for electric cars in India, but that too may vary according to state EV policies. The ultra-affordable Renault EV is expected to be launched in India by 2022.

The sales of cars in India has taken a significant beating due but sales of EVs have been in green due to the government's push for electric mobility.

Kwid EV hatchback will be equipped with a 26.8 kWh battery powering a permanent magnet synchronous motor.

It makes 44PS of maximum power and 25 Nm of peak torque. This gives the car a top speed of 105 kmph. The battery supports fast charging which can charge it from 30 to 80 percent in 30 minutes. A standard charger takes around 4 hours for a full charge.

Since the Kwid EV is an electrified version of the standard Kwid, it gets the same CMF-A platform. It is identical in its aesthetics and differs majorly only in its powertrain. The interior of the Kwid EV gets an 8-inch touchscreen infotainment system, 4G connectivity and voice recognition. It also gets a Tyre Pressure Monitoring System, EasyLink smart connect system, in-built air quality control system and other safety features such as high-temperature automatic cut-off to protect the battery.

The major USP of KWID EV is its affordability though it lacks anything disruptive like Tesla or luxury brands like Jaguar or Porsche. But not to sell it short, the car's battery (like the Chinese City K-ZE) is enough for the drive under 250 Kms, which makes it one of the best buys for your money.



While we hope that this car will debut in India before 2022, the French carmaker has hinted that all depends on the development of EV infrastructure in India.

SIGNIFICANCE OF RS 50,000 CRORE SOLAR GRID PROJECT IN LEH-LADAKH

Solar Energy Corporation of India, under the renewable energy ministry, is promoting around 5,000 MW and 2,500 MW solar power projects in Ladakh and Kargil, respectively.

KEY HIGHLIGHTS

The solar project, which is estimated to cost around Rs 50,000 crore, is expected to be completed by 2023

The Ladakh project would be located at Hanle-Khaldo in Nyoma, which is at a 254 km distance from Leh

The locals would be able to take up jobs like maintaining transformers and cleaning solar panels

The Centre has finalised the sites for the Rs 50,000 crore grid-connected solar photo-voltaic project in the districts of Ladakh and Kargil. This will be the single biggest investment in the region since the Centre scrapped special status granted to Jammu and Kashmir and bifurcated it into two Union Territories – J&K and Ladakh.

Solar Energy Corporation of India (SECI), under the renewable energy ministry, is reportedly promoting around 5,000 MW and 2,500 MW solar power projects in Ladakh and Kargil, respectively.

The Ladakh project would be located at Hanle-Khaldo in Nyoma, which is at a 254 km distance from Leh. The power generated from the Ladakh project would be transmitted to Kaithal, Haryana, through a 900 km line that would be laid along the Leh-Manali road. The solar project, which is estimated to cost around Rs 50,000 crore, is expected to be completed by 2023.

Significance of the project

The mega solar project is aimed at providing electricity for the region and preserving glaciers and reducing around 12,750 tonnes of carbon emissions every year. Apart from this, the project is expected to improve job prospects for the people of the region. The locals would be able to take up jobs like maintaining transformers and cleaning solar panels.

The project is also expected to augment development in the remote border regions. The topography of the region has meant that getting the fruits of development to the last mile is always a challenge. The solar project aims to change that.

Besides, because it shares a border with China, Ladakh's location is crucial from the strategic point of view as far as India is concerned. The developmental thrust will also be an enabler in beefing up India's strategic heft in the area. Ladakh with its vast open spaces is uniquely suited to benefit from solar power.



India's renewable energy push

According to a government report, India's total installed capacity of wind and solar energy as on June 30 was 36.36 GW and 27.5 GW, respectively. The report also says that renewable energy comprises more than 22 per cent of India's total installed capacity.

“A total of 80.46 GW of renewable energy capacity has been installed in the country as on June 30, 2019, which includes 29.55 GW from Solar & 36.37 GW from wind power,” Power and New & Renewable Energy Minister RK Singh said in a written reply to the Rajya Sabha in July.

The government has set an ambitious target of having 175 GW of clean energy capacity by 2022, including 100 GW solar and 60 GW of wind energy.

As per India's submission to the United Nations Framework Convention on Climate Change on Intended Nationally Determined Contribution (INDC), a cumulative electric power capacity of 40 per cent from non-fossil fuel-based energy resources is to be installed by 2030.

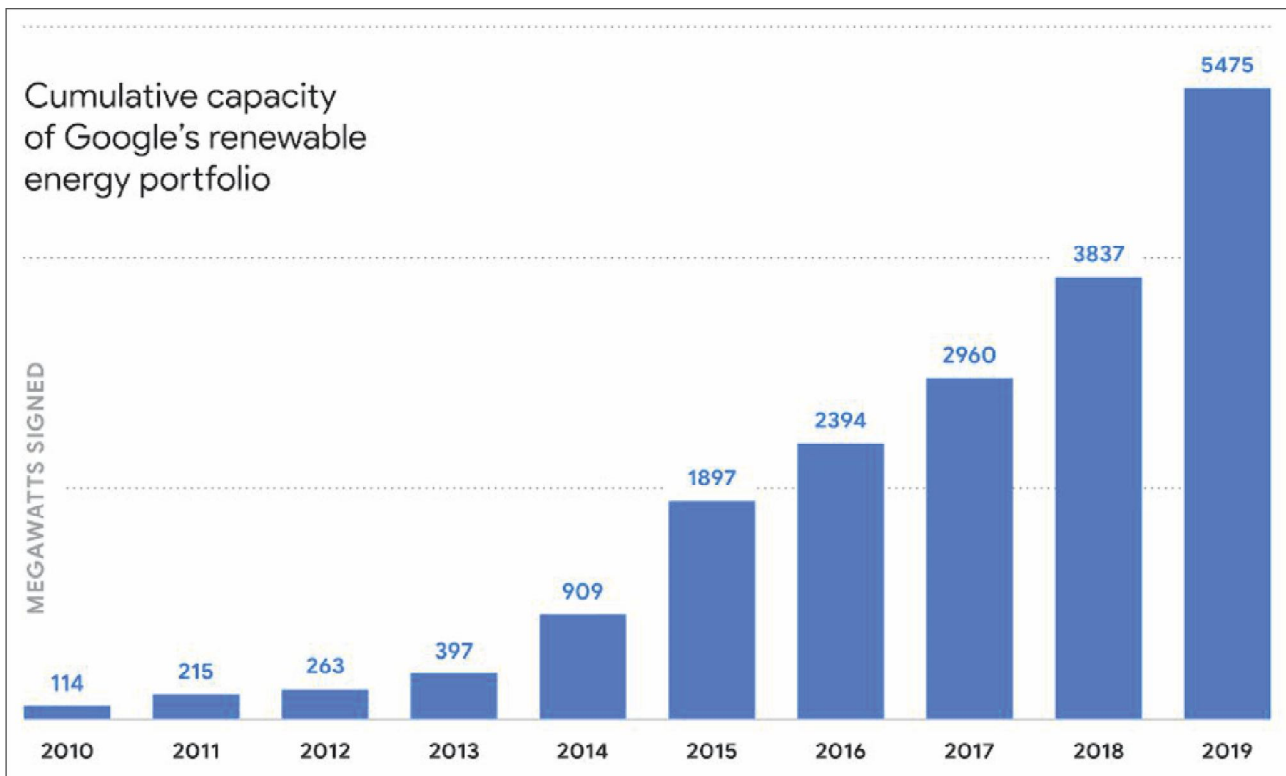
In another reply, the minister also told the House that a total of 42 solar power parks with an aggregate capacity of around 23.40 GW have been approved by the government so far to facilitate achievement of 100 GW target by March 2022.

GOOGLE ANNOUNCED

Technology giant Google announced the “**biggest corporate purchase of renewable energy in history**” according to a post published on its blog. The deal includes 18 new energy deals for 1600 MW in agreements.

According to Google, which also released its 2019 environmental report, these deals will increase the company’s overall portfolio of solar and wind agreements by more than 40 percent to 5,500 MW, which is equivalent to the capacity of a million solar rooftops.

An interesting fact that emerged is Google, in these long-term purchase commitments, wants the creation of new solar and wind projects unlike buying RE from existing renewable facilities. These 18 deals will see over USD 2 billion in new energy infrastructure spread across the United States, Europe, and Chile.



“Our latest agreements will also spur the construction of more than USD 2 billion in new energy infrastructure, including millions of solar panels and hundreds of wind turbines spread across three continents. In all, our renewable energy fleet now stands at 52 projects, driving more than USD 7 billion in new construction and thousands of related jobs,” said Sunder Pichai, CEO of Google, in his post.

The new deals will include the purchase of energy from 720 MW of solar farms in North Carolina (155 MW), South Carolina (75 MW), and Texas (490 MW). In South America, a new 125 MW of renewable energy capacity to the grid will supply the Google data center in Chile. Finally, almost half (793 MW) of the new renewable energy capacity purchased will be located in Europe, in Finland (255 MW), Sweden (286 MW), Belgium (92 MW), and Denmark (160 MW).

This marked a shift away from the existing US projects which were “wind-driven,” and opting for more solar as it has become “increasingly cost-effective” due to price decreasing by more than 80% in the past decade. Another new addition is the company’s first “hybrid technology deal that combines solar and wind.”

Google claims that in 2018, it achieved twelve consecutive years of carbon neutrality and, for the second year in a row matched 100 percent of the electricity consumption of its global operations with renewable energy. By the end of 2018, Google had contracts to purchase more than 3.75 gigawatts (GW) of output from renewable energy projects. These contracts have led to nearly USD 5 billion in new capital investment in projects around the world.

ELECTRIC TECH COULD HELP REVERSE BALDNESS

Few things on earth strike fear into the hearts of men more profoundly than hair loss. But reversing baldness could someday be as easy as wearing a hat, thanks to a noninvasive, low-cost hair-growth-stimulating technology developed by engineers at the University of Wisconsin-Madison.

“I think this will be a very practical solution to hair regeneration,” says Xudong Wang, a professor of materials science and engineering at UW-Madison.

Wang and colleagues published a description of the technology in the journal ACS Nano.

Based on devices that gather energy from a body’s day-to-day motion, the hair-growth technology stimulates the skin with gentle, low-frequency electric pulses, which coax dormant follicles to reactivate hair production.

The devices don’t cause hair follicles to sprout a new in smooth skin. Instead they reactivate hair-producing structures that have gone dormant. That means they could be used as an intervention for people in the early stages of pattern baldness, but they wouldn’t bestow cascading tresses to someone who has been as bald as a billiard ball for several years.

Because the devices are powered by the movement of the wearer, they don’t require a bulky battery pack or complicated electronics. In fact, they’re so low-profile that they could be discreetly worn underneath the crown of an everyday baseball cap.

Wang is a world expert in the design and creation of energy-harvesting devices. He has pioneered electric bandages that stimulate wound-healing and a weight-loss implant that uses gentle electricity to trick the stomach into feeling full.

The hair-growth technology is based on a similar premise: Small devices called nanogenerators passively gather energy from day-to-day movements and then transmit low-frequency pulses of electricity to the skin. That gentle electric stimulation causes dormant follicles to “wake up.”

“Electric stimulations can help many different body functions,” says Wang. “But before our work there was no really good solution for low-profile devices that provide gentle but effective stimulations.”

Because the electric pulses are incredibly gentle and don’t penetrate any deeper than the very outermost layers of the scalp, the devices don’t seem to cause any unpleasant side effects. That’s a marked advantage over other baldness treatments, like the medicine Propecia, which carries risks of sexual dysfunction, depression and anxiety.

What’s more, in side-by-side tests on hairless mice, the devices stimulated hair growth just as effectively as two different compounds found in baldness medicines.

“It’s a self-activated system, very simple and easy to use,” says Wang. “The energy is very low so it will cause minimal side effects.”

The researchers have patented the concept with the Wisconsin Alumni Research Foundation, and they hope to move forward with human testing soon.

THE SKAI IS A MULTIPURPOSE FLYING CAR POWERED BY HYDROGEN FUEL CELLS

Another startup is joining the long list of companies developing flying cars. Alaka'i Technologies is launching a new craft called the Skai, and like many competitors, Alaka'i plans to use its vehicle as a flying taxi or delivery van. What sets the Skai apart is its power source: Hydrogen fuel cells.

"It's the cleanest form of energy available on the planet," Alaka'i board member Dr. Bruce Holmes told Digital Trends regarding the choice of hydrogen. Many competitor designs use batteries, but Alaka'i believes it can achieve a lower environmental impact and better performance from fuel cells, Holmes said. Fuel cells have much greater energy density than batteries, he said, meaning they can store more energy in a given volume. That allows for a reduction in weight without sacrificing operating range. The Skai's fuel cells are also 99% recyclable, don't use the rare-earth metals found in lithium-ion batteries, and have a decades-long lifespan, Holmes said. Refueling is also quicker than recharging a battery pack, at under 10 minutes.

Long range and quick refueling times have been touted as perks of hydrogen fuel-cell cars, but producing and distributing hydrogen have proven problematic. Alaka'i will get its hydrogen from renewable sources, such as wind, solar, and hydro-electric, Holmes said. Instead of building a network of permanent fueling stations, Alaka'i plans to refuel its Skai vehicles from trucks, similar to the way airplanes are refueled on the tarmac at airports. That eliminates a major infrastructure headache that is currently plaguing makers of terrestrial fuel-cell vehicles.

The Skai's fuel cells provide power to electric motors that turn six rotors. That setup gives the Skai the appearance of a giant drone, which is appropriate, as Alaka'i plans to develop an autonomous version after launching the initial human-piloted model. The Skai has room for four passengers and a pilot, and Alaka'i is aiming for a payload capacity of 1,000 pounds and a top speed of 118 mph. On a full tank of hydrogen, the Skai should have a range of 400 miles, or about four hours of flying time, according to Alaka'i.

Alaka'i has four main uses planned for the Skai. A passenger-carrying Skai Cab version will be used as a flying taxi, similar to what Uber and numerous other companies have proposed. The Skai Cargo model will be used as a flying van for so-called "last-mile" deliveries, taking packages short distances to their final destinations. The Skai Med version will be aimed at first responders, while the Skai Craft will be designed for use as personal transportation, either through sales to individual owners or through sharing services.

Upon hearing the phrase "hydrogen-powered aircraft" many people will likely think "Hindenburg." Regardless of the power source, an aircraft that will spend most of its time flying over populated areas needs safety backups. Holmes claims the Skai can continue flying even if it loses a rotor, and can undertake a powered emergency landing after losing two rotors. The Skai's hydrogen fuel-cell system is "triple redundant," according to an Alaka'i press release, and the vehicle is equipped with a parachute.

The Skai needs to complete the Federal Aviation Administration (FAA) certification before it can go into production. Alaka'i is aiming to complete that process by 2020, Holmes said. If it can overcome that hurdle, Alaka'i will still face competition from other startups, as well as established aviation companies like Rolls-Royce and Bell Helicopter, all of which are looking to fill the skies with flying taxis.

TAMIL NADU SOLAR ENERGY POLICY - 2019

GOVERNMENT OF TAMIL NADU

Energy Department

1.0 Introduction

1.1. The Special Report on Global Warming (SR 15, October 2018) by the Intergovernmental Panel for Climate Change (IPCC) estimates the impact of global warming of 1.5 °C above pre-industrial levels. One of the key messages that comes out strongly from this report is that the world is already seeing the consequences of 1°C of global warming through more extreme weather, rising sea levels and diminishing Arctic sea ice, among other changes. The report states that under emissions in line with current pledges under the Paris Agreement (known as Nationally-Determined Contributions or NDCs), global warming is expected to surpass 1.5°C, even if they are supplemented with very challenging increases in the scale and ambition of mitigation after 2030.

1.2. The report also states that limiting warming to 1.5°C implies reaching net zero CO₂ emissions globally around 2050 and concurrent deep reductions in emissions of non-CO₂ climate forcers, particularly methane. Risks to natural and human systems are lower at 1.5°C than at 2°C.

1.3. Drastically de-carbonising existing energy system by investing in renewable energy systems, including solar, at an unprecedented scale and pace is required to address global warming. IPCC highlights that social justice and equity are core aspects of climate-resilient development pathways that aim to limit global warming to 1.5°C and that the poor and underprivileged communities need to be included in the solutions addressing climate mitigation. With the ratification of the Paris Agreement COP21, India has committed to reduce the emissions intensity of its GDP by 33%-35% by 2030 from 2005 levels by increasing the share of non-fossil-based energy resources to 40% of installed electric power capacity by 2030 and by creating additional (cumulative) carbon sinks of 2.5-3 GtCO₂e through additional forest and tree cover by 2030.

1.4. The Government of India and the Government of Tamil Nadu have put in place various policies and mechanisms to promote solar energy, including financial incentives for certain categories of users. The Government of India has set a target of 100,000 MW of solar energy capacity for 2022 of which 40% (40,000 MW) is to come from the consumer category in the form of rooftop and similar small scale solar energy systems.

1.5. The Government of Tamil Nadu had notified the Tamil Nadu Solar Energy Policy, 2012 in October 2012. This exemplary Solar Energy Policy included solar net metering for consumer Solar Photo Voltaic systems. This early adoption of net metering contributed to making the State a national leader in solar energy. Many other Indian States followed suit in adopting solar energy policies similar to the Tamil Nadu policy.

1.6. Vision Tamil Nadu 2023, a Strategic Plan for Infrastructure Development in Tamil Nadu, includes a solar energy target of 5,000 MW. More recently the Ministry of New and Renewable Energy (MNRE) proposed a solar energy target for the year 2022 of 9,000 MW for Tamil Nadu. To meet the Vision Tamil Nadu 2023 and MNRE 2022 targets substantial solar energy capacity addition is required. Achieving the solar energy target for 2023 requires new policy instruments and solar energy programs, especially so for the consumer category. Enhanced grid penetration of solar energy requires smart grid management and energy storage solutions.

1.7. With the experience gained from implementation of the Tamil Nadu Solar Energy Policy, 2012 and with a view of accelerating the transition to a sustainable energy future, this Tamil Nadu Solar Energy Policy, 2019 provides an inclusive policy framework that promotes both utility category and consumer category solar energy generation through various enabling mechanisms.

2.0 Preamble

2.1. Government of Tamil Nadu has an unwavering commitment to the Directive Principle of the State Policy enshrined in Article 48.A of the Constitution, which stipulates that “the State shall endeavour to protect and

improve the environment”. It was out of this commitment that the Government issued the Tamil Nadu Solar Policy 2012, which was the first comprehensive solar energy policy in the country.

2.2. Government’s commitment to people’s welfare is equally resolute. Access to affordable, reliable, quality electricity supply for all is a welfare enabler.

2.3. With these twin policy objectives of protecting the environment and the welfare of its people, Tamil Nadu is committed to a sustainable and equitable energy future.

2.4. Energy is one of the key driving forces of socio-economic development and change. Long-term energy security is therefore an essential element of sustainable development. The rapid depletion of non-renewable energy sources and the adverse effects caused to the globe by the process of extracting energy from fossil fuels call for urgent solutions while demand for energy will keep increasing. The universally accepted view is that only energy from renewable sources offer a solution for a sustainable energy future. Renewable energy targets will have to be set to align with the nation’s commitment of its greenhouse gas emissions.

2.5. The Government of India has launched the Jawaharlal Nehru National Solar Mission (JNNSM) under the National Action Plan for Climate Change (NAPCC) to promote ecologically sustainable growth while addressing India’s energy security challenges. The objective of the National Solar Mission is to establish India as a global leader in solar energy by creating the policy conditions for its diffusion across the country as quickly as possible. Tamil Nadu will make a significant contribution to the National Solar Mission.

2.6. Tamil Nadu is one of the most urbanized and industrial states of India. A continuous increase in energy demand from all sectors is expected in the years to come. To meet the increasing energy demand in a sustainable manner, it is essential that the Government of Tamil Nadu formulates and implements energy policies that are driven by a clear vision and implemented through the participation of all stakeholders.

2.7. This Tamil Nadu Solar Energy Policy 2019 intends to create a framework that enables an accelerated development of solar energy in the State.

3.0 Tamil Nadu Solar Energy Vision

3.1. Solar energy will be a major contributor to a sustainable energy future for Tamil Nadu.

3.2. Solar energy development will be part of an overall energy strategy that includes demand side management, energy conservation, energy efficiency initiatives, distributed renewable energy generation, electric mobility and smart grids.

3.3. Solar energy development will provide green jobs to a significant number of the State’s workforce.

3.4. Solar energy will become available, accessible and affordable to all citizens of Tamil Nadu.

3.5. Solar energy generation will significantly contribute to reducing the carbon and water footprint of the State’s energy sector.

3.6. Tamil Nadu will be an international climate leader for emerging economies by 2023.

4.0 Solar Energy Policy Objectives

4.1. Define clear and transparent policy governance.

4.2. Establish an eco-system that translates the solar energy vision into enabling policy systems and processes.

4.3. Use regulatory mechanisms to ensure that Tamil Nadu will achieve, or exceed, the solar energy portfolio obligations as may be determined by the Tamil Nadu Electricity Regulatory Commission (TNERC) from time to time.

4.4. In accordance with regulations, facilitate open access to the public electricity grid and thereby create opportunities for grid-connected distributed generation of solar power.

4.5. Encourage and incentivise electricity consumers to set up solar energy systems.

- 4.6. Establish a 'Single Window System' for technical support, funding support and project clearance through cooperation between the concerned Government departments.
- 4.7. Encourage public-private partnerships and joint ventures to mobilize investments in solar energy projects, manufacturing facilities, research, and technology development.
- 4.8. Facilitate 'Ease of Doing Business' in the solar energy sector.
- 4.9. Create an investment-friendly environment that provides opportunities for private individuals, companies, local bodies, government departments and others to contribute to and participate in the generation of solar energy, particularly for the electricity consumer to become a "prosumer" (a producer-consumer).
- 4.10. Create a win-win situation for all stakeholders.
- 4.11. Create a road map to achieve the objectives of the "National Renewable Energy Policy" to be issued by the Central government.

5.0 Scope of Solar Energy Policy

- 5.1. This policy will be applicable to projects, programs and installations relating to solar photovoltaic energy (solar PV) and solar thermal energy and to both utility and consumer category systems.
- 5.2. This policy uses the terms "utility category systems" and "consumer category systems", which are defined as follows:
 - 5.2.1. Utility category systems: where the objective is sales of solar energy to a distribution licensee or a third party or self consumption at a remote location (wheeling). For these systems the grid connection is through a dedicated gross metering interface.
 - 5.2.2. Consumer category systems: where the objective is self-consumption of solar energy and export of surplus energy to the grid. For these systems the grid connection is through a consumer service connection of a distribution licensee.

6.0 Solar Energy Targets

- 6.1. Tamil Nadu will have an installed solar energy generation capacity of 9,000 MW by 2023. Of this target, 40% will be earmarked for consumer category solar energy systems.
- 6.2. Targets for subsequent years will be set by the Government of Tamil Nadu through notifications under this policy.

7.0 Legislative Framework for Policy

- 7.1. The legislative framework for this solar energy policy includes the following provisions; namely:-
 - 7.1.1. The Electricity Act, 2003 (Central Act 36 of 2003) (the "Act") mandates that the Electricity Regulatory Commissions and the Governments shall take necessary steps to promote Renewable Energy. The preamble to the Electricity Act, 2003 recognizes the significance and importance of promotion of efficient and environmentally benign policies.
 - 7.1.2. Section 61(h) of the Act provides that while specifying the terms and conditions of determination of tariff, State Regulatory Commissions shall be guided, inter-alia, by the promotion of cogeneration and generation of electricity from renewable sources of energy.
 - 7.1.3. The National Electricity Policy (NEP) and Tariff Policy notified by the Central Government under the provisions of section 3(1) of the Act have also addressed the issues of untapped potential of energy from nonconventional and renewable energy sources.
 - 7.1.4. Section 86(1)(e) of the Act specifies that one of the functions of the State Electricity Regulatory Commissions is to promote cogeneration and generation of electricity from renewable sources of energy by providing suitable measures for connectivity with the grid and to promote sale of such power to any person. The Regulatory Commission is also required to stipulate that a certain percentage of the total consumption of

electricity in the area of a distribution licensee shall be obtained from renewable energy source (Renewable Energy Purchase Obligation, or RPO).

7.1.5. Section 86 (1)(e) of the Act mandates State Electricity Regulatory Commissions (SERCs) to notify RPOs, ensure RPO compliance and invoke penal provisions against defaulting entities.

8.0 Solar Energy grid feed- in

8. 1. Solar energy grid feed-in mechanisms will include, but may not be limited to the following:

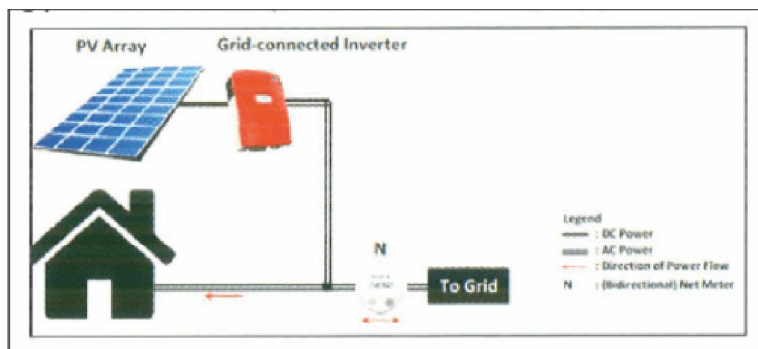
8.1.1. Solar energy gross feed-in (utility category):



The solar energy is fed into the grid for energy sales to the distribution licensee or a third party under the open access facility or for captive consumption under open access. In the case of distribution licensees, the solar energy fed into the grid will be purchased by the distribution licensee at the prevailing solar energy tariffs as determined by the TNERC or a tariff determined by a bidding process. Utility category solar energy gross feed-in will be permitted at all voltage levels, subject to applicable wheeling and other applicable charges and conditions for various voltage levels as may be determined by TNERC. However, no wheeling facility is permitted at LT voltage level. Wheeling of Energy will be permitted only, during the generation of electricity and will be adjusted slot/block to slot/block and excess energy fed into the grid shall be treated as infirm power under sale to Discom category only. The excess energy will be paid at the rate as determined by TNERC from time to time.

8. 1.2. Solar energy net feed-in (consumer category):

The solar energy is used for self-consumption with the surplus, if any, being exported to the grid. A bidirectional service connection energy meter will be installed by the distribution licensee to record the imported and exported energy. The imported energy is debited at the applicable consumer tariff



while the exported energy is credited on the basis of a consumer solar energy tariff to be determined by TNERC. The consumer pays the difference between the debit and credit amounts. If the cumulative credit amount exceeds the debit amount during any billing cycle, the net credit is carried over to the next billing cycle. At the end of a 12-month settlement period as may be determined by TNERC, the net credit, if any, the consumer has the option to receive payment of the net credit balance. Solar energy net feed-in will be available to all low tension (LT) electricity consumer categories subject to TNERC regulations as may be determined from time to time.

9.0 Solar Energy feed-in tariffs

9.1. Solar energy gross feed-in at utility sale tariff will be based on competitive bidding subject to approval of TNERC and net feed-in tariffs will be determined by TNERC.

9.2. TNERC may introduce time-of-the-day (TOD) solar energy feed-in tariffs to encourage solar energy producers and solar energy storage operators to feed energy into the grid when energy demand is high.

10.0 Solar Energy implementation models

10.1. Solar energy systems may be implemented with the following models:

10.1.1. Upfront ownership: The purchaser of the solar system pays the supplier for the capital cost and takes ownership of the solar system.

10.1.2. Deferred ownership: The solar system is installed and operated by the supplier. The purchaser makes system performance-based payments to the supplier or leases the system from the supplier. System ownership is transferred to the purchaser on a mutually agreed date or is triggered by a mutually agreed event.

11.0 Solar energy mandates and programs

11.1. Building by- laws and ECBC (Energy Conservation Building Code) compliance: Any building type that requires ECBC compliance will follow ECBC compliance guidelines for the installation of solar PV and solar thermal energy systems. The Directorate of Town and Country Planning in collaboration with local bodies and Chennai Metropolitan Development Authority shall amend their building by-laws to mandate ECBC. The Electrical Inspectorate or other entity as determined by the Government will be responsible for compliance monitoring on an annual basis.

11.2. The Government will introduce a policy to promote electric vehicles, and solar energy powered charging facilities.



11.3. All public buildings, defined as per Tamil Nadu Public Buildings (Licensing) Act, will be encouraged to install solar energy systems, both photovoltaic and thermal.

11.4. Corporations, municipalities and local urban bodies will be encouraged to use solar PV energy based street lights and water supply installations.

11.5. Solar thermal for the residential, institutional and commercial segments will be promoted.

11.6. Solar thermal applications for industrial use, including concentrated solar power (CSP) will be promoted.



12.0 Incentives

12.1. Consumer category solar energy will be exempted from electricity tax for two years from the date of this policy.

12.2. Suitable incentive schemes will be designed to promote solar energy generation in the agricultural sector. This may include incentives to farmers.

12.3. Solar energy injected into the grid of the distribution licensee by solar energy producers who have no renewable energy purchase obligations (non-obligated entities), including the solar energy export by non-obligated electricity consumers, can be claimed by the distribution licensee towards fulfilment of their Renewable Energy Purchase Obligations (RPO).

12.4. The Government of Tamil Nadu will promote the manufacture of solar energy components including solar cells, inverters, mounting structures and batteries etc. in the State. Lands will be provided for the development of solar system component manufacturing. A single window process for all departmental approvals, including a set time limit for each approval will be designed and managed by TEDA.

12.5. A suitable incentive scheme will be designed to promote the co-utilization of land for solar energy projects, crop cultivation and water conservation.

13.0 Grid Connectivity and Energy Evacuation

13.1. For consumer category solar PV systems, the system capacity at the service connection point shall not exceed 100% of the sanctioned load of the service connection.

13.2. The maximum cumulative solar PV capacity at distribution transformer level may be reviewed and determined by TNERC from time to time to enable optimal solar energy penetration.

13.3. All new service connection meters in Tamil Nadu shall be configured for bidirectional energy recording and display so that all new service connections and existing service connections for which the meters are replaced in the normal course of maintenance are ready for effecting solar energy net feed-in metering at any time in the future.

13.4. For consumer category solar systems, the distribution licensee will install the required energy meters and commission the solar metering facility within three weeks from the date of application by the consumer.

13.5. The distribution licensee will enhance and update its billing system such that relevant details pertaining to solar gross feed-in and net feed-in are included in the electricity consumers' bills. Distribution licensees will make available online the billing data for each consumer, along with a sample bill explaining the various billing components above.

13.6. The distribution licensee shall implement online applications for solar energy metering. Distribution licensees shall also display online the status of all solar energy metering applications received, whether online or offline. Distribution licensees will maintain a section-wise database of solar gross and net feed-in metering application requests, approval status, installation and commissioning data, which will be submitted to the Government on a periodical basis.

13.7. Distribution licensees shall update the status of the cumulative solar capacity connected at each distribution transformer on their website.

13.8. For all grid connected solar energy systems the distribution licensee will make use of the existing distribution network to the maximum extent possible so that utilisation of such infrastructure is optimised.

13.9. For high tension consumers, open access regulations of TNERC will apply, subject to the conditions imposed by SLDE. However wheeling for less than 1 MW shall not be allowed.

13.10. To manage the integration of increasing quantities of renewable energy in the Tamil Nadu grid, flexible supply side generation capacity such as pumped hydro storage, gas turbines, flexible thermal coal power generation and energy storage systems will have to be added by TANGEDCO and the private sector. The Government will develop suitable strategies to rapidly enhance flexible power generation and energy storage capacity in consultation with TNERC and TANGEDCO.

14.0 Awareness Creation, Education and Capacity Building

14.1. All public and private schools are encouraged to introduce a curriculum on energy and environment into their syllabus.

14.2. State Government Departments and State Public Sector Undertakings (PSUs) will be encouraged to participate in annual solar energy and energy conservation training programmes organized by TEDA and other agencies.

14.3. All higher education institutions are encouraged to host an annual energy and environment day to create awareness about climate change and the benefits of renewable energy as a climate change mitigation strategy.

15.0 Solar Energy Research

15.1. Tamil Nadu will facilitate and support research in the solar energy sector. TEDA, in collaboration with other Government Departments, will constitute a Solar Energy Research Fund (SERF).

15.2. Tamil Nadu will closely collaborate with multi-lateral agencies to advance solar energy research and deployment in the State.

15.3. Solar or other renewable energy projects installed for study, research or pilot purposes may be given special priorities and exemptions by the TNERC and the distribution licensee on the recommendation of the Government.

16.0 Monitoring and Evaluation

16.1. An inter-departmental monitoring and coordination committee for new and renewable energy sources, including solar energy (the “Renewable Energy Committee”) shall be constituted under Principal Secretary, Energy for monitoring the implementation of this policy and to ensure that policy objectives and targets are achieved.

17.0 Role of the State Agencies

17.1. TEDA shall take the lead in launching this Solar Energy Policy with the use of media, public relations, billboards, advertisements, websites, and more. It will also communicate amendments, if any, to this policy to major stake holders via its website and/or other means.

17.2. TEDA will lead a comprehensive information and awareness creation effort in order to promote solar energy in the State.

17.3. TEDA/TANGEDCO will network and coordinate with national and international institutions that are leaders in the solar energy sector in order to promote and enhance collaboration and joint R&D projects.

17.4. TANGEDCO will design and facilitate the development of innovative solar energy projects in various modes including public, private, public-private partnership and build-own-operate-transfer (BOOT) modes. TEDA will advise TANGEDCO on these projects.

TANGEDCO will also initiate Energy Storage Projects/Solar Parks/Floating Solar Parks either on its own or as Joint Venture (JV) initiatives in collaboration with Solar Energy Corporation of India (SECI).

17.5. Statutory clearances that may be required for the development and commissioning of solar energy projects will be facilitated by TEDA with the concerned Government departments and agencies through a single window and time-bound process.

17.6. TEDA will facilitate and expedite access to various concessions and incentives provided by the Ministry of New And Renewable Energy, Government of India including capital cost subsidies, where applicable.

17.7. TEDA will provide project development and technical advice and assistance for the implementation of solar energy projects.

17.8. TEDA will provide advisory and consulting services to corporations, municipalities and local urban bodies on financing instruments for solar energy projects.

17.9. TEDA will undertake periodical review of progress of solar energy projects under development and facilitate speedy clearances and approvals if necessary.

17.10. The Chief Electrical Inspector to Government shall notify and coordinate with the Directorate of Town and Country Planning to obtain necessary amendments in the building bylaws, as outlined in this policy to facilitate extensive adoption of solar plants.

17.11. TEDA shall notify and coordinate with State Government Departments and Public Sector Undertakings to facilitate extensive adaptation of solar energy plants as outlined in this policy.

18.0 Operative Period

This policy shall come into effect on **04.02.2019** and shall remain valid until superseded or modified by another policy. The Government will review the implementation of this policy annually to evaluate the actual results against policy objectives.

“An ounce of practice is worth a thousand words.” – MAHATHMA GANDHI

Distribution boards



Miniature Circuit Breakers (MCB)



Moulded Case Circuit Breakers (MCCB)



Residual Current Circuit Breakers (RCCB)



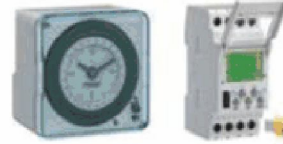
RCBO, RCD+MCB modules



Manual Changeover Switches



Automatic Transfer Switches



Time Switches



Digital Energy Meters



Contactors



Isolating Switches



Surge Protection Devices



LED Indicators



Plug & Socket Outlets

THE SOLAR ROOF ON HYUNDAI'S NEW SONATA HYBRID ADDS 1,300KM OF RANGE PER YEAR

Hyundai rolled out a new version of its Sonata Hybrid, which would not normally be news around these parts but for the fact that it comes from the factory with a solar roof. It actually adds some zero emission range to the otherwise petrol-powered vehicle.



Under the hood, the new Sonata Hybrid comes with a rather standard gasoline engine that has been paired with an electric motor. Energy from the moving vehicle is recouped through an onboard generator and stored in batteries which can then power the electric motor. The implementation of hybrid powertrains are not new, but this one uses its rooftop solar panel to actually recharge its drive battery. That translates to a few more electric miles each day and each year that come from the sun instead of recovery after petroleum.



The addition of solar panels does not make this car a clean, tree hugging electric vehicle by any means, but it does add meaningful range when it sits in the sun. Hyundai claims that with 6 hours of sunlight each day, the solar panels will add enough charge to the battery for 1,300 kilometers (808 miles) per year. Granted, that's only an extra 3.6 kilometers per day (2.2 miles), but it is a nice little bonus. It's like finding a bit of spare change in your pocket each and every day.

The new solar roof is the first generation in production for the company and was designed specifically for hybrids. It not only adds range, it offsets the inherent "vampire drain" of electric vehicle batteries that saps power from the battery when it sits parked.

Hyundai has a second generation solar roof in the works for its combustion vehicles that will be semi-transparent. Think about this one like the roof in a Tesla Model 3 or the glass roof in a Model S, but with a little less light coming through. It sounds beautiful, but we will have to wait to see what Hyundai's actual production version looks like to make an assessment. These initial developments provide the ramp up to the development of a lightweight solar roof for fully electric vehicles. None of these are likely to allow the vehicle to be completely powered by the sun, but serve to keep the vehicle battery from latent discharge and add a few miles of range per day, which is better than nothing.

A BEAUTIFUL TRUE STORY

In England in *1920* there was a graduation ceremony for a batch of *new doctors*.

It was attended by the British Prime Minister of that time.

During the ceremony, the dean who was in charge of that batch, gave the necessary advice to these new graduates.

He told them the following incident which happened with him sometimes back:

"It was after midnight, and I heard a knock on my door.

It was an old lady, and she said to me: 'O my doctor, my child is sick and in a very serious condition, so please do something to save him.

I rushed out to follow her to her house without worrying what will happen.

Because it was a stormy night, and very cold. The rain was pouring down very heavily. I did not fear for my life.

Her house was on the outskirts of London, and after a difficult journey, we reached her house.

She lived in a small room with her son.

When I entered the room, I saw her son at the corner of this room groaning and deeply in pain.

After I did my duty towards the sick child, the mother gave me a small bag with money.

I refused to take this bag and I told her gently that I can't accept that payment, because I felt sorry for their situation.

Then I promised her that I will take care of her child until he gets better."

The dean continued in his speech by saying: " *This is the true profession of medicine, and being a doctor is the closest profession to mercy and one of the closest to God*"

As soon as the head doctor finished his speech, the *Prime Minister* jumped out of his seat and headed to the podium.

" *Permit me Sir, to kiss your hand*.

For twenty years now and I am looking for you. I am the child you mentioned in your story just now.

Oh, my mother will be happy now and she will rest in peace. Her only wish was for me to find you and to reward you, for that goodness you did for us at the time we were living in poverty"

That poor child who became the Prime Minister of England was: *"Lloyd George"

Plant goodness wherever you go, even if it is not on your place. Because it will never get lost wherever you will plant it.

It is even more nice if your goodness lasts longer.

Because no one shall harvest that goodness except the one who has planted it.

Doing goodness to others will always purify your heart, and it will fight any kind of evil which comes your way.

The owner of goodness does not fall, if he falls he will fall on a pillow to comfort and support him.

****May God Make us among the people who always do good to others*.***

ENERGY, ELECTRICAL ENERGY AND RENEWABLE ENERGY – 25

Sustainable Growth, Sustainable Electrical Energy and Renewable Energy

Review of Bio Energy and the Potentials

Solar Energy – Focus on Solar Thermal and Electricity.

Review of Bio Energy – continued

Recently in the UN Environments meet, as well as in the UNGA address, our PM indicated figures of 1,75,000 MW as the target for Renewable Energy and the aim for the near future would be around 4,50,000 MW and so on. As per the present trends and activities, these figures would be based on Solar and Wind Energies primarily. With the kind of Bio Energy potentials seen, these figures could increase substantially proving the statement made by one of the earlier Vice Presidents of USA remarking that India can play a leading role in the area of Renewable Energy.

In the last issue we discussed details of the large CNG Programme in India and the active role played by IOC and other oil marketing companies. The plans are initially for around 15 Million Tons of CBG per annum and the final target being 60 Million Tons. As we discussed, the CBG can address different forms of Energy requirement too. The CBG is required to be transported and supplied by the producer in batteries of cylinders as shown in figures below.

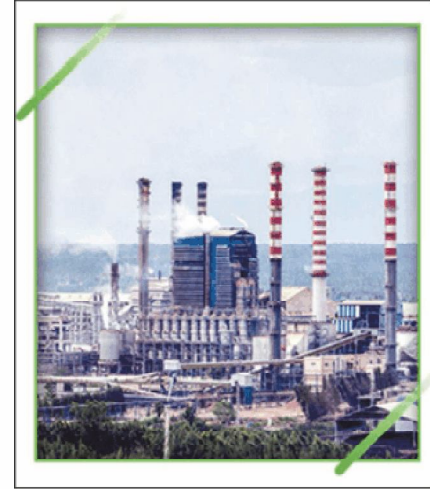


Presently our total Petroleum products requirements are about 190 Million Tons. The other products that can address the needs are Bio Diesel and Bio Oil/ Bio Crude and we have discussed earlier broadly about the technologies and the potentials.

Bio Oil from Sugar cane trash and tops for use as fuel for Boilers of sugar factories and other uses:

Sugar canes form an important part in the agricultural operations of our country and we being the second largest producers of Sugar Cane in the world, our average production per annum presently stand at about 350 Million Tons. The practice at present in most of the Sugar Mills, is the use of the 'Bagasse' to use as fuel for the boilers to produce steam and electricity to meet the requirements of Sugar Mills. It is found that the Bagasse can be used to produce paper and plants like TamilNadu News Print Ltd (TNPL) are already producing all varieties of paper using Bagasse. It is also interesting to find that TNPL, from the wash water of the Bagasse produces large quantities of Bio Gas to replace about 12 Kilo Litres of Furnace Oil per annum, used for producing heat for drying of paper. We see that the value provided by Bagasse is much higher than being burnt

as fuel. It therefore sounds prudent to use Bagasse as input for paper mills and TNPL is already sourcing Bagasse from a few sugar mills and supplying coal for their boilers to produce steam and electricity. This practice should probably spread to cover the entire Bagasse produced in the country by all sugar mills (The total bagasse generated could be around 150 Million Tons) and this will result in saving of lot of trees as most of the paper, presently are produced using wood in our country.



Sugar Mills, for their process and use require both steam and electricity and therefore the Boilers and generation of steam and electricity form a part of the Sugar Mills.

The question that comes to our mind immediately is that the scheme to use entire bagasse for making paper and use of coal for the boilers, results in use of Fossils in place of bagasse, which is a biomass material.

This is where another technology we discussed earlier comes to support the Renewable Energy Mission. The Sugar cane Trash and tops, generated after harvesting of sugarcane makes a wonderful biomass material for producing Bio Oil - all biomass are suitable for bio oil production, but sugar cane trash contains low moisture which can also be dried easily as we require bone dry biomass for producing Bio Oil. Presently almost all of the trash and tops are burnt in the fields nowa days as it is not found economical to collect and transport them for any use including as fuel for the boilers.

350 Million Tons of Sugar Cane crop generates about 50 Million Tons of trash and tops which in turn produces about 42 Million tons of bone dry biomass. By the appropriate Pyrolysis process, this 42 Million Tons can help produce about 20 Million Tons of Bio Oil. This is quite a huge quantity and a large portion of this can be used as fuel for the Boilers of Sugar Factories after suitable conversion.





The Portable Bio Oil Production Equipment which was also discussed briefly earlier, with capacities to handle about 3 to 10 Tons per day of trash, can help convert the waste biomass to bio oil at site itself, avoiding transportation of the biomass. We only need to transport the bio oil and the bio char, which is a by-product, can be used to enrich the fields.

The following News Item that appeared very recently makes an interesting reading in the same context of Bio Oil we are discussing. A detailed study of the News and the consequences of such large scale agricultural burnings in Punjab and Haryana, resulting in pollution up to Delhi, will reveal the seriousness of the problem and the ban that has been imposed. In fact these Biomass can also be processed to produce Bio Oil.

PUNJAB SEES INCREASE IN AGRICULTURAL FIRES

Jacob Koshy

NEW DELHI, SEPTEMBER 27, 2019 00:00 IST

SHARE ARTICLE - Spike in fires from last year: official

There has been spike in agricultural fires — a phenomenon that's known to worsen air pollution — in Punjab in September, and significantly more than fires in September last.....

It is estimated that more than 20 million tons of Paddy straw is burnt in Punjab in every harvest season.

20 Million Tons is lot of biomass materials and suitable planning either with the help of a large number of portable machines or by installing suitable sized plants in a number of locations around these areas, can help address the problem, resulting in production of around 10 million tons of Bio Oil.

We have discussed some of the areas and opportunities to replace petroleum products with renewable energy products and more detailed studies of various kinds of waste biomass from agriculture and plantations will

throw open lot of opportunities, but the real need of the hour is development and perfection of appropriate technologies to suit our conditions and the types of biomass that need to be addressed and so on.



(To be continued)
S. Mahadevan, B.E., F.I.E., M.B.A.,
Consultant, Energy and Energy Efficiency,
Mobile: 98401 55209

POWERFUL QUOTES OF MAHATHMA GANDHI

“Be the change that you want to see in the world.”

“A man is but a product of his thoughts. What he thinks he becomes.”

“I will not let anyone walk through my mind with their dirty feet.”

“Nobody can hurt me without my permission.”

“Happiness is when what you think, what you say, and what you do are in harmony.”

“The weak can never forgive. Forgiveness is an attribute of the strong.”

“A coward is incapable of exhibiting love; it is the prerogative of the brave.”

“Live as if you were to die tomorrow. Learn as if you were to live forever.”

“Freedom is not worth having if it does not include the freedom to make mistakes.”

“Service which is rendered without joy helps neither the servant nor the served.”

“The best way to find yourself is to lose yourself in the service of others.”

“In a gentle way, you can shake the world.”

“Whenever you are confronted with an opponent, conquer him with love.”

“An eye for an eye will make the whole world blind.”

“The future depends on what you do today.”

“Earth provides enough to satisfy every man’s needs, but not every man’s greed.”

List of Emergency Helpline Numbers All Over in India

Helpline Number	Department
100	Police
101	Fire
102	Ambulance
103	Traffic Police
104	State level Helpline for Health
108	Disaster Management/ Medical Helpline
112	All in one Emergency Number (General Emergency Department of Telecommunications (DoT))
131	Indian Railway General Enquiry
139	Railway Enquiry
181	Domestic abuse and sexual violence-Women's Helpline
197	Directory enquiry service
198	Telephone Complaint Booking
1031	Anti Corruption Helpline
1033	Emergency Relief Centre on National Highways
1066	Anti-poison
1071	Air Accident
1072	Train accident
1073	Road Accident/ Traffic Help Line
1090	Anti terror Helpline/Alert All India
1091	Women Helpline in Distress
1092	Earth-quake Help line service
1096	Natural Disaster Control Room
1097	AIDS Helpline
1098	Child Abuse Hotline
1099	Central Accident and Trauma Services
1551	Kisan Call Center
1906	LPG emergency helpline number
1910	Blood Bank Information
1919	Eye Donation/ Eye bank information service
1947	Aadhar Card-UIDAI (Unique Identification authority of India),1800-180-1947)
1950	Election Commission of India
1800-11- 4000	National Consumer Helpline

*"You must not lose faith in humanity.
Humanity is like an ocean;
if a few drops of the ocean are dirty,
the ocean does not become dirty."*

– MAHATHMA GANDHI



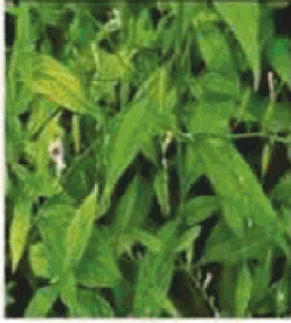
தமிழ்நாடு அரசு

மக்கள் நல்வாழ்வு மற்றும் குடும்பநலத்துறை

இந்திய மருத்துவம் மற்றும் ஹோமியோபதி ஆணையரகம்

நிலவேம்பு குடிநீர்

இவற்றில் சேரும் மருந்துகள்



நிலவேம்பு



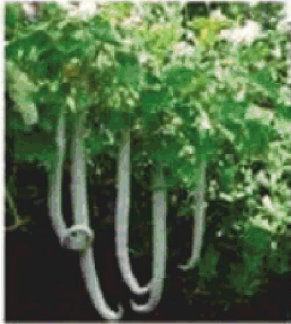
வெட்டிவேர்



விலாமிச்சம்வேர்



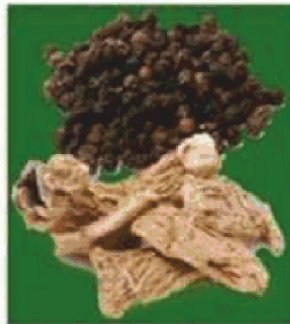
சந்தனம்



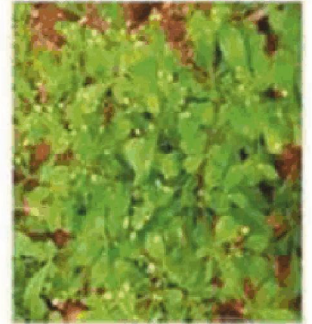
பேய்ப்புடல்



கோரைக்கிழங்கு



சுக்கு, யிளகு



பற்பாடகம்

குடிநீர் அளவு

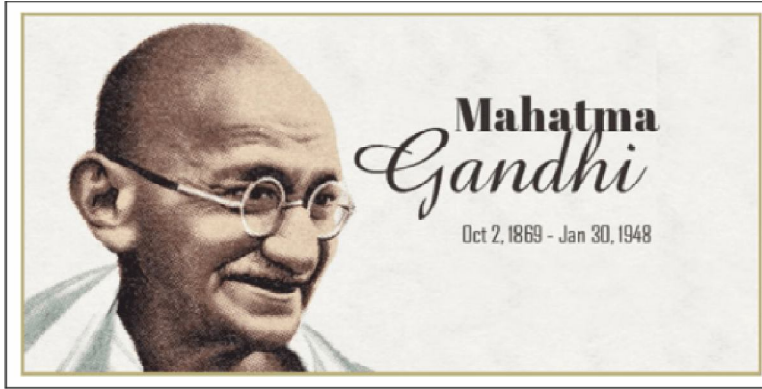
5 வயது முதல் 12 வயது வரை உள்ள குழந்தைகளுக்கு 10 மி.லி. தினமும் 2 வேளை அருந்தவும்.

பெரியவர்களுக்கு 50மி.லி. தினமும் 2 வேளை அருந்தவும்.

எல்லா வகை காய்ச்சலும் குணமாகும்

MAHATHMA GANDHI ON BUSINESS AND MARKETING

“It is difficult, but not impossible, to conduct strictly honest business.” – Mahatma Gandhi



“A customer is the most important visitor on our premises. He is not dependent on us. We are dependent on him. He is not an interruption of our work. He is the purpose of it. He is not an outsider of our business. He is part of it. We are not doing him a favour by serving him. He is doing us a favour by giving us the opportunity to do so.”

Recollections of a Marketing Man:

Hello Friends,

Recently I did a poll on my facebook page on the ‘Greatest Marketer of All Time’. Most of the respondents favoured the names of Mahatma Gandhi, Narendra Modi and Steve Jobs. While I believe that the Greatest Marketer of All time is none other than Mahatma Gandhi.

Now let us talk about as to why I call him the greatest marketer of all time. But before going further, let us check out the definition given by American Marketing Association.

‘Marketing is the activity, set of institutions, and processes for creating, communicating, delivering, and exchanging offerings that have value for customers, clients, partners, and society at large.’

If you look at the definition closely, you will find that marketing should ultimately benefit the society. In marketing, we not only talk about the businesses for profit, but we also talk about not for profit businesses like Government organizations or Non Governmental organizations and so on.

Similarly According to Philip Kotler, an idea can also be marketed. So what was the idea, Mahatma Gandhi was propagating. Mahatma Gandhi was propagating the idea of Freedom. He was propagating the idea of Non Violence. And it was all there for the benefit of the society.

The idea still lives in our hearts all across the world and it is not restricted to India only. The idea has an impact on billions of people all across the world, not only in India. Will any CEO of any company can have this kind of impact on the hearts as well as the minds of people. The answer will definitely be No.

A long way back in 1890, Mahatma Gandhi said in a speech in South Africa –

“A customer is the most important visitor on our premises.

He is not dependent on us. We are dependent on him.

He is not an interruption in our work. He is the purpose of it.

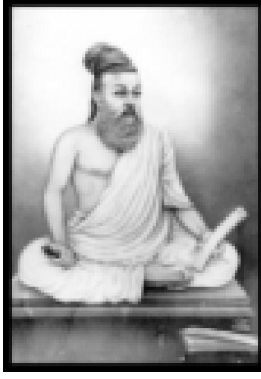
He is not an outsider in our business. He is part of it.

We are not doing him a favour by serving him.

He is doing us a favour by giving us an opportunity to do so.”

This quote is so important, clear and powerful. In many companies in India, this quote is used as a pledge. If you visit any of the Khadi and Village Industries Stores, you will find a poster of the same. Such is the importance of these famous words by Mahatma Gandhi.

TIRUKKURAL AND FAIR AND ETHICAL MANAGEMENT - 9



The process of decision making and dealing with people and judgement must also have important aspects of impartiality and thorough knowledge of different dimensions. Two Kurals are chosen below to bring out the aspects of impartiality and to seek expert advice if necessary to get the depth of knowledge to deal with the situation of people or problems. The second Kural deals with the situation of implementation of decision regarding people and punishment if needed and how

the degree of punishment must be decided with care for people too, as they form an important part in the whole system.

*Ornthukan Nodathu Iraipurinthu Yaarmattum
Thernthusei Vakhthe Murai Kural 541*

ஒர்ந்துகண் ணோடாது இறைபுரிந்து யார்மாட் டும்
தேர்ந்துசெய் வக்தே முறை. குறள் 541

“Deliberate well and lean not to either side: be impartial and consult the men of law: that is the way to administer justice”

*Thakkangu Nadith Thalaichchella Vannaththal
Oththangu Oruppathu Venthu Kural 561*

தக்காங்கு நாடித் தலைச்செல்லா வண்ணத்தால்
ஒத்தாங்கு ஒறுப்பது வேந்து. குறள் 561

“The prince (manager/ management) shall measure the guilt of the offender and punish him so that he offend not again: but the punishment shall not be excessive”

HOME FESTIVALS - 11

கார்த்திகை - Kartikai (November/December)



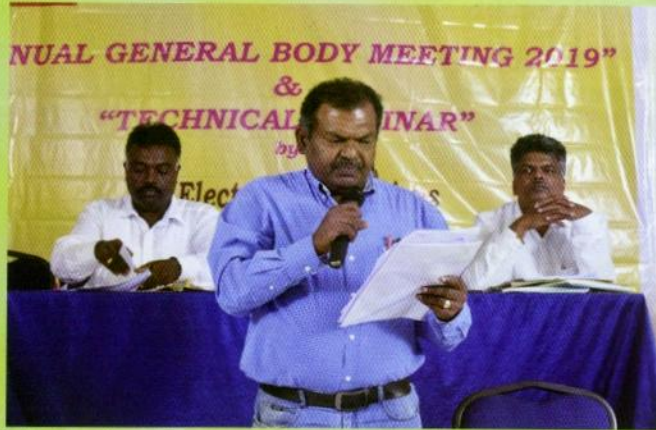
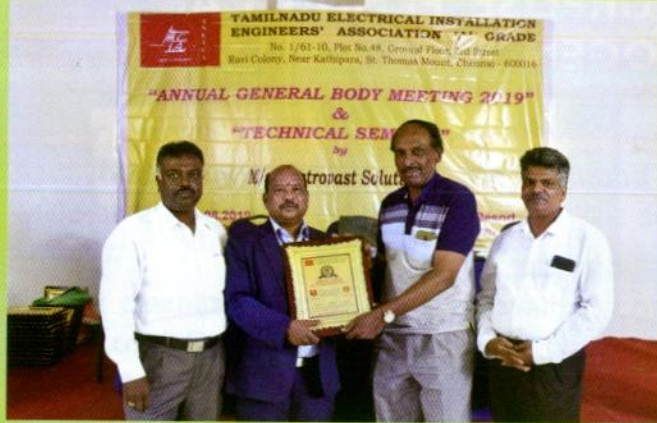
Krittika Dipa (right) is a joyous festival held on the Krittika nakshatra (when the moon is in Pleiades constellation). Also called Sivalaya Dipa, it is celebrated most famously at Tiruvannamalai (upper left in the painting),

on top of Arunachala Hill, home of saint Ramana Maharishi. A bonfire is lit on top that can be seen for miles around. Karthigai Purnima, the full-moon day, honours Lord Murugan. In one traditional story, six sparks from Siva's third eye became six babies (lower left), later gathered into one six-headed Arumugam (centre) 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.

(To be continued)

ANNUAL GENERAL BODY MEETING TECHNICAL SEMINAR - PHOTOS



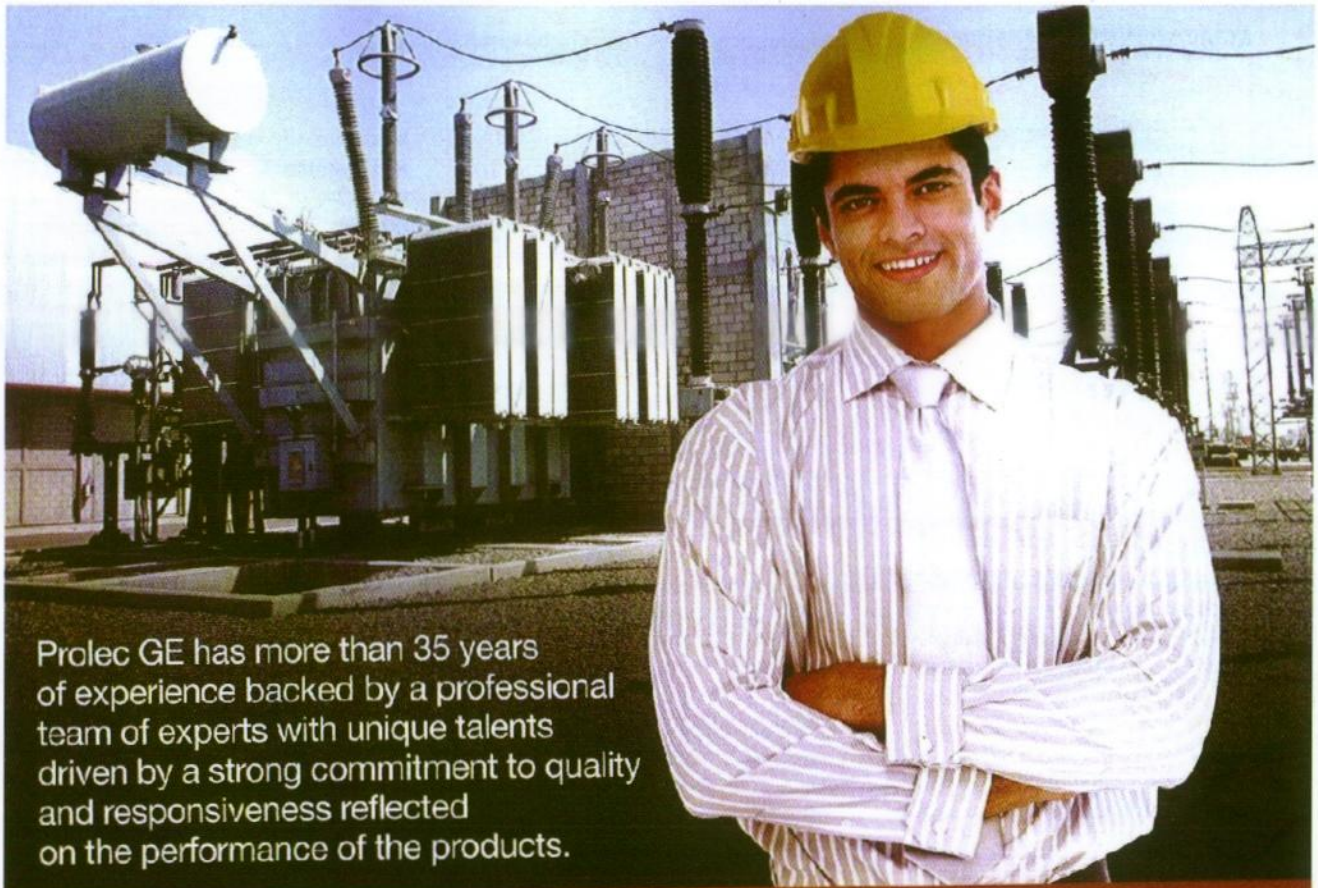


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