

The Institution of Engineers (India)

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VOICE.......

FARIDABAD LOCAL CENTRE

"A Century Of Service to the Nation"

Estd 1920

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Dear Engineers, Greetings to all of you,

CHAIRMAN'S MESSAGE

It gives me immense pleasure on the release of IEI Newsletter of Faridabad Local Centre. An initiative and efforts have been made to update members regarding activities of Faridabad IEI centre. We look forward for support and suggestions for further improvements.

FROM HONORARY SECRETARY'S DESK

Technical Activities Conducted by Faridabad Local Centre during the 3rd Quarter Oct to Dec. 2023 :-

- 1. World Habitat Day on 3rd October 2022
- 2. World Standards Day on 14th October 2022
- 3. Technical Lecture Meeting on Electric Vehicle : Present Scenario and Future Opportunities (India) on 19th November 2022
- 4. All India National Seminar for 3 days on 10th 11th 12th December 2022
- 5. Energy Conservation Day on 15th December 2022

Technical Activities to be held in 4th Quarter 2023 January to March 2023 :-

- 1. Technical Lecture Meeting on 7th January 2023
- 2. Technical Lecture Meeting on 18th February 2023
- 3. World Engineering Day on 4th March 2023
- 4. World Water Day on 22nd March 2023

Corporate Members are requested for their Contribution towards the Institution of Engineers (India) by way of Articles, Advertisements and Donation etc.

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> Er. Inderdeep Singh Oberoi, FIE Honorary Secretary

The Institution of Engineers (India) FARIDABAD LOCAL CENTRE



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Technical Activities Conducted by IE (I) Faridabad Local Centre



The Institution of Engineers (India), Faridabad Local Centre organized a Webinar on "World Habitat Day "on 3nd Oct 2022 through digital medium- Zoom App. The event started by lighting the lamp of knowledge digitally and IE (I) Anthem was played.

Excerpts of deliberation: Er. I.S Oberoi, FIE: - World Habitat Day is observed on the first Monday of October every year. This year, it is being observed on October 4 across the world. The day is recognized by the United Nations and observed to reflect on the state or condition of towns and cities and promote the basic right to adequate shelter or housing for all. This year's theme is "Mind the Gap. Leave No One and Place Behind". The focus is on the growing inequalities and challenges in cities and human settlements. These are the problems that have been aggravated due to what the UN calls triple Cs: Coronavirus (COVID-19), Climate, and Crisis. These triple Cs have hampered the progress made against poverty. The UN calls tackling urban poverty and inequality an "urgent global priority". They have called for local actions toward Sustainable Development Goals.

Honorary Secretary, Er. K.R. Gupta FIE concluded the session with vote of thanks and expressed his gratitude to all the speakers, Moderator and all the participants. The event was then punctuated with National Anthem. Attended by 32 participants the event was a grand success.



Webinar on "World Standards Day" Theme – Shared Vision for a Better World

The Institution of Engineers (India), Faridabad Local Centre organized "World Standards Day "on 14th Oct 2022 at Multimedia Centre Hall, J.C Bose University of Science & Technology (YMCA). The event started by lighting the lamp of knowledge digitally and IE (I) Anthem was played.

Excerpts of deliberation: Dr. Pradeep Kumar, FIE, The Sustainable Development Goals (SDGs), which project to address social imbalances, develop a sustainable economy, and slow the rate of climate change, are highly ambitious. To reach them will require the cooperation of many public and private partners, and the use of all available tools, including international standards and conformity assessment.

Honorary Secretary, Er. K.R. Gupta FIE concluded the session with vote of thanks and expressed his gratitude to all the speakers, Moderator and all the participants.

The event was then punctuated with National Anthem. Attended by 42 participants the event was a grand success.

Technical News

LVM3 M2/One Web India-1 Mission is completed successfully. All 36 satellites are placed into their intended orbits

In its second operational flight, LVM3 launch vehicle placed 36 satellites of One Web to their intended orbits taking off at 0007 Hrs. on October 23, 2022, from the second launch pad at Satish Dhawan Space Centre, Sriharikota, and Andhra Pradesh.

This was the fifth flight of LVM3. This was a dedicated commercial mission for a foreign customer through NSIL. A total of 36 One Web Gen-1 satellites of about 150 kg each totaling about 5,796 kg were launched to a circular low-earth orbit of about 601 km with a 87.4 degree inclination. The separation of satellites involved a unique maneuver of the cryogenic stage to orientation and reorientation covering 9 phases spanning 75 minutes. One Web confirmed the acquisition of signals from the satellites.

One Web Gen-1 satellites utilize a bent-pipe technology approach to offer communication in Kuband and Ku-bands. They are arranged in 12 orbital planes with 49 satellites in each plane at 1200 km.

Calling the launch of LVM3 M2 a historic event, Shri S. Samantha, Chairman, ISRO lauded the synergetic efforts between ISRO, NSIL, and One Web in realizing the mission in a record time. He specifically acknowledged the design and development of an inertial navigation system at LPSC for C25 operations.

This was one of the biggest commercial orders executed by ISRO. With this launch, the LVM3 enters into global market in a grand manner.



Technical Activities Conducted by IE (I) Faridabad Local Centre





Excerpts of deliberation: Er. Ankur Mittal, MIE Er. Ankur Mittal presented the topic with a well prepared presentation. It was discussed in the webinar about need of Electric Vehicle (EV) adaptability in India to address lowering the GHG emission. Currently there are lots of challenges in establishing the Electric Vehicles in India. This technical session on the subject topic provided the brief literature review on the Electric Vehicles with discussions on the advantages and threats in promoting EVs in India. The topic covered the information for the options offered by automobile manufacturers, government subsidy plans and progress going on making e vehicle affordable and durable in masses.

Honorary Secretary, Er. I.S Oberoi, FIE delivered vote of thanks and expressed his gratitude to Speaker Er. Ankur Mittal, Moderator and all the participants at the end with FLCC commitment to serve the Engineering fraternity continually and consistently. The event was then punctuated with National Anthem. Attended by 42 participants the event was a grand success.



The Institution of Engineers (India), Faridabad Local Centre organized a technical activity on the topic of **"Energy Conservation Day"** on 15 December 2022. The speakers for the event were Er J.P Malhotra, President, DLF Industries Association, Keynote speaker, Dr. P.P Mittal, Accredited Energy Auditor & Er. Manish Mangla, Energy Auditor, LEED AP. The event started at 16: 00 Hrs by welcoming audience by Er Sushil Bajaj, Program Moderator and Chairperson technical committee - FLCC. The event started by lamp lightening and IEI anthem.

Excerpts of deliberation: Er. J.P Malhotra, FIE: - Er. J. P. Malhotra discussed regarding the importance of energy conservation. He stressed on opening Energy clubs in the schools, so that the future generation can be sensitized regarding the energy conservation importance. He also mentioned about the Electric motors replacement scheme launched by the Govt. of India for MSME and requested the audience to take the benefit of the same. Importance of Solar Energy was also highlighted and announced the incentive on behalf of DLF industries association to all the beneficiaries of solar energy, who can bring down their power bills for more than 5%.

Excerpts of deliberation: Dr. P.P Mittal, FIE: - <u>Energy Journey of</u> <u>Mankind</u> when the human life appeared on the universe, the only need of human was food. As the wheels of civilization further moved, the necessity of human life also required clothing. A stage comes when the need of shelter also arose, up to this stage humans were living either on trees, or in caves. But after food, clothing & shelter (Roti, Kapda & Makan), the overriding necessity of human kind became Energy. Now it is difficult to imagine our existence without energy. Energy has become the life and requirement of present civilization. It touches every one of us and is major input to economy for development of any area/country.

Honorary Secretary, Er. I.S Oberoi, FIE delivered vote of thanks and expressed his gratitude to Speakers Er. J.P Malhotra, Dr. P.P Mittal, Er. Manish Mangla, Moderator Er. Sushil Bajaj and all the participants at the end with FLCC commitment to serve the Engineering fraternity continually and consistently. He also apprised the audience regarding the spiritual energy and harnessing the same by spreading positiveness. The event was then punctuated with National Anthem. Attended by 31 participants the event was a grand success.

Technical Activities Conducted by IE (I) Faridabad Local Centre



Brief Details about the Programme:

IE(I)- Faridabad Local Centre organized a Three Days All India National Seminar in association with IMT Industries Association on the technical topics related to industries & SME on 10th 11th 12th December 2022 at HSIIDC Ground, Sector – 68, Faridabad, Haryana. The keynote speaker for the event was Sh. Krishanpal Gurjar Honorable Minister of State of Power and heavy Industries, Government of India and Member of Parliament - Faridabad. The event started at 11: 00 AM on 10th Dec. The Welcome address was delivered by Er. Kuldip Raj Gupta, Chairman IEI FBD LC. The event started every day by lamp lightening and IEI anthem.

The speakers for the event were Dr. Raman and N Shukla, Mr. Sushant Kumar, Mr. Rajesh Sharma, Dr. Saumyaditya Bose, Er. Ankur Mittal, Er. Ankush Prashar, Mr.J.R Choudhary, Mr. Jagdish Chaubey, Er. Rakesh Bhatia, Mr. Rajan Gupta, Er. Gurparsad Singh Bagga

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Day-1(Forenoon)	Er. Kuldip Raj Gupta, Chairman IE(I) FBD LC, delivered welcome address and made aware the gathering about need of the technical knowledge for the industries & SME in the current competitive environment.
Inaugural Session Inaugural programme, Keynote Address	Er. I.S Oberoi, Honorary Secretary, IEI FBD LC. apprised the audience regarding the activities and achievements of IEI at centre & local level The Keynote Address was delivered by Shri Krishanpal Gurjar, Honourable Minister of State of Power and heavy Industries, Government of India and Member of Parliament - Faridabad Invited Lecture by - Dr. Ramanand N. Shukla Topic - ZED for MSME Industries
Day-1(Afternoon) Technical Session I 1 Invited Lecture (about 1 hour duration) and minimum 4 papers or two invited lectures / presentations	1. Invited Lecture by - Topic Mr. Sushant Kumar 2. Invited Lecture by - Topic Mr. Rajesh Sharma 3. Invited Lecture by - Topic Dr. Saumyaditya Bose - Dr. Saumyaditya Bose Corporate Sustainability/ ESG strategy - Vendor Registration Maruti
Day-2 (Forenoon) Technical Session II 1 Invited Lecture (about 1 hour duration) and minimum 4 papers or two invited lectures / presentations	1. Invited Lecture by Topic - Er. Ankur Mittal 2. Invited Lecture by Topic - Solar Energy- Utilisation & Economics for the industry 2. Invited Lecture by Topic - Er. Ankush Prashar - Safety First: Challenges & Opportunity Area
Day-2 (Afternoon) Technical Session III Minimum 2 papers or two invited lectures / presentations	1. Invited Lecture by Topic - Er. J.R Choudhary - 2. Invited Lecture by Topic - Mr. Jagdish Chaubey - 8. Role of Metallurgical in manufacturing Industries
Day-3 (Forenoon) Technical Session IV 1 Invited Lecture (about 1 hour duration) and minimum 4 papers or two invited lectures / presentations	1. Invited Lecture by - Mr. Satish Nema 2. Invited Lecture by - Er. Rakesh Bhatia Topic - Finance & Capital options for MSM0E Topic - Vendor Registration in Difence and Railways 3. Invited Lecture by - Gurparsad Singh Bagga - Recycling of PV modules: A Circular economy approach
Day-3 (Afternoon) Valedictory Session	Valedictory Address by - Er. I.S Oberoi, Hon' Secretary IEI FBD LC. giving his presentation regarding IEI History

Technical News



PSLV-C54/EOS-06 Mission is accomplished. All the satellites have been injected into their intended orbits.

ISRO's work horse PSLV-C54 has successfully launched EOS-06 satellite along with Eight Nano-satellites into two different SSPOs. The mission was accomplished from Satish Dhawan Space Centre SHAR on 26th November 2022.

EOS-06 is third generation satellite in the Ocean sat series, which provides continued services of Oceansat-2 with enhanced payload capability. The satellite onboard carries four important payloads viz. Ocean Color Monitor (OCM-3), Sea Surface Temperature Monitor (SSTM), Ku-Band Scatter meter (SCAT-3), ARGOS. The Oceansat-2 which was a launched during Sept-2009 configured to cover global oceans and provide continuity of ocean color data with global wind vector and characterization of lower atmosphere and ionosphere. The mission resulted in many research collaborations nationally and internationally on various areas global chlorophyll distribution, Kd 490 distribution, ocean color images, oil spillages, wind vector products. Researchers have successfully split seawater without pretreatment to produce green hydrogen :-



The international team was led by the University of Adelaide's Professor ShizhangQiao and Associate Professor Yao Zheng from the School of Chemical Engineering.

"We have split natural seawater into oxygen and hydrogen with nearly 100 per cent efficiency, to produce green hydrogen by electrolysis, using a non-precious and cheap catalyst in a commercial electrolyser," said Professor Qiao.

A typical non-precious catalyst is cobalt oxide with chromium oxide on its surface.

"We used seawater as a feedstock without the need for any pretreatment processes like reverse osmosis desolation, purification, or alkalisation," said Associate Professor Zheng.

"The performance of a commercial electrolyser with our catalysts running in seawater is close to the performance of platinum/iridium catalysts running in a feedstock of highly purified deionised water. The team published their research in the journal Nature Energy.

"Current electrolysers are operated with highly purified water electrolyte. Increased demand for hydrogen to partially or totally replace energy generated by fossil fuels will significantly increase scarcity of increasingly limited freshwater resources," said Associate Professor Zheng.

Seawater is an almost infinite resource and is considered a natural feedstock electrolyte. This is more practical for regions with long coastlines and abundant sunlight. However, it isn't practical for regions where seawater is scarce.

Seawater electrolysis is still in early development compared with pure water electrolysis because of electrode side reactions, and corrosion arising from the complexities of using seawater.

"It is always necessary to treat impure water to a level of water purity for conventional electrolysers including desalination and deionisation, which increases the operation and maintenance cost of the processes," said Associate Professor Zheng.

"Our work provides a solution to directly utilise seawater without pretreatment systems and alkali addition, which shows similar performance as that of existing metal-based mature pure water electrolyser."

The team will work on scaling up the system by using a larger electrolyser so that it can be used in commercial processes such as hydrogen generation for fuel cells and ammonia synthesis

Technical News

Researchers propose new structures to harvest untapped source of freshwater :-



The study, led by civil and environmental engineering professor and Prairie Research Institute executive director Praveen Kumar, evaluated 14 waterstressed locations across the globe for the feasibility of a hypothetical structure capable of capturing water vapor from above the ocean and condensing it into fresh water -- and do so in a manner that will remain feasible in the face of continued climate change.

Kumar, graduate student Afeefa Rahman and atmospheric sciences professor Francina Dominguez published their findings in the journal Nature Scientific Reports.

"Water scarcity is a global problem and hits close to home here in the U.S. regarding the sinking water levels in the Colorado River basin, which affects the whole Western U.S.," Kumar said. "However, in subtropical regions, like the Western U.S., nearby oceans are continuously evaporating water because there is enough solar radiation due to the very little cloud coverage throughout the year."

Previous wastewater recycling, cloud seeding and desalination techniques have met only limited success, the researchers said. Though deployed in some areas across the globe, desalination plants face sustainability issues because of the brine and heavy metal-laden wastewater produced -- so much so that California has recently rejected measures to add new desalination plants.

The researchers performed atmospheric and economic analyses of the placement of hypothetical offshore structures 210 meters in width and 100 meters in height.

Through their analyses, the researchers concluded that capturing moisture over ocean surfaces is feasible for many water-stressed regions worldwide. The estimated water yield of the proposed structures could provide fresh water for large population centers in the subtropics.

"The climate projections show that the oceanic vapor flux will only increase over time, providing even more fresh water supply," Rahman said. "So, the idea we are proposing will be feasible under climate change. This provides a much needed and effective approach for adaptation to climate change, particularly to vulnerable populations living in arid and semi-arid regions of the world."

The researchers said one of the more elegant features of this proposed solution is that it works like the natural water cycle.

"The difference is that we can guide where the evaporated water from the ocean goes," Dominguez said. "When Praveen approached me with this idea, we both wondered why nobody had thought about it before because it seemed like such an obvious solution. But it hasn't been done before, and I think it is because researchers are so focused on land-based solutions -- but our study shows other options do, in fact, exist."

The researchers said this study opens the door for novel infrastructure investments that can effectively address the increasing global scarcity of fresh water.

Harnessing solar energy: New method improves readings of double-sided panels :-



A leading laboratory in photonics and renewable energy at the University of Ottawa has developed a new method for measuring the solar energy produced by bifacial solar panels, the double-sided solar technology which is expected to meet increased global energy demands moving forward.

Published in the journal Joule, this study from the SUNLAB team in the Faculties of Engineering and Science proposes a characterization method that will improve the measurement of bifacial panels indoors by considering external effects of ground cover such as snow, grass and soil. This will provide a way to consistently test bifacial solar panel performance indoors that accurately represents how the panels will perform outdoors.

With bifacial photovoltaics expected to provide over 16% of global energy demand by 2050, the SUNLAB's methodology will improve international device measurement standards which currently do not distinguish between ground cover.

"Our proposed characterization method, the scaled rear irradiance method, is an improved method for indoor-measuring and modelling of bifacial devices that is representative of outdoor environmental conditions," explains Erin Tonita, lead author and a Physics PhD student studying under Professor Karin Hinzer, whose research group develops new ways to harness the sun's energy.

Photovoltaics is the study of converting solar energy into electricity through semiconducting materials, such as silicon. In bifacial solar panels, the semiconducting material is wedged between two sheets of glass to allow for sunlight collection on both sides, with one side typically angled towards the sun and the other side angled towards the ground. The additional light collected by bifacial solar panels on the rear-side offers an advantage over traditional solar panels, with manufacturers touting up to a 30% increase in production compared to traditional solar panels. Bifacial solar panels are also more durable than traditional panels and can produce power for over 30 years.

"Implementation of this method into international standards for such panels can enable predictions of outdoor bifacial panel performance to within 2% absolute," says Tonita.

"This method is of particular importance as renewable energy penetration increases towards a net-zero world, with bifacial photovoltaics projected to contribute over 16% of the global energy supply by 2050, or around 30,000 TWh annually," says Hinzer, founder of SUNLAB and the University Research Chair in Photonic Devices for Energy and a Professor at the School of Electrical Engineering and Computer Science.

Housed at the University of Ottawa's Centre for Research in Photonics, SUNLAB is the premier Canadian modelling and characterization laboratory for next generation bifacial, multi-junction, and concentrator solar devices.