

FORTNIGHTLY ENGINEERING REVIEW

The voice of engineers

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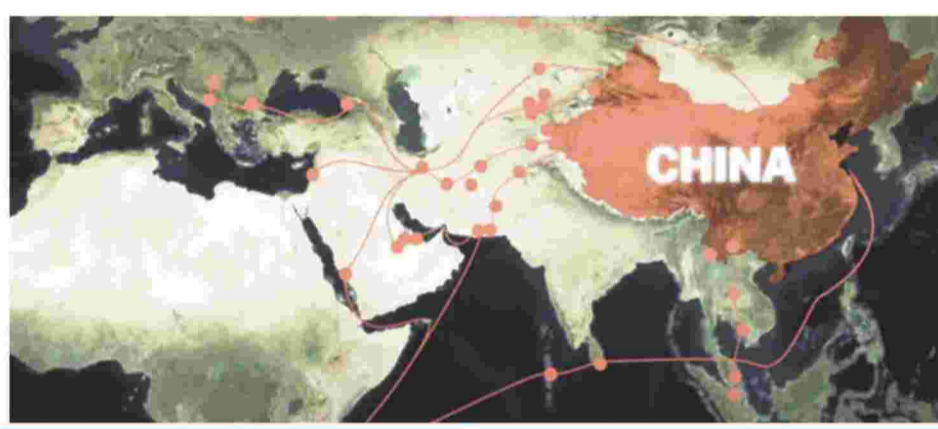
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Belt and Road initiative after 10 years of its birth Has BRI really trapped countries into a debt distress?

While China concentrates on celebrating the 10th anniversary of its Belt and Road initiative, multiple countries and analysts are looking at the success of this initiative which according to many, continues to lose its charm among the nations that banked on it for the economic development.



The initiative, a signature foreign policy strategy launched in autumn 2013 after Xi became president has spawned ports, railways, highways, power plants and other projects stretching from Asia to Africa, says a report that appeared in a leading Asian news outlet.


From Beijing's standpoint, the report says, the BRI has largely achieved its two original goals, according to Ammar Malik, a senior researcher at AidData, a research lab at U.S. University William & Mary.

One way to deploy "excess construction and financial capacity at home to return-generating projects abroad," he said. The other, he

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- Christopher Reeve

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Belt and Road initiative after 10 years of its birth

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added, was to build strategic leverage by spreading goodwill toward China in participating countries and gaining policy influence over governments.

China's State Council recently said that about 150 countries and 30 international organizations had signed BRI cooperation agreements by June this year, with construction contracts reaching \$2 trillion.

But while the BRI helped to meet developing economies' project financing needs, alongside other international lenders, critics say it has contributed to debt distress amid rising interest rates and other economic pressure.

"The proportion of BRI participating countries now suffering from debt distress per the International Monetary Fund has doubled in the past eight years," said AidData's Malik. He cited examples including Zambia, Sri Lanka and Pakistan, which have either defaulted or are at risk of doing so.

China consistently rejects the charge that it has led some countries into a "debt trap."

But AidData's study also found that over a third of all BRI projects have suffered from implementation challenges such as environmental damage, corruption scandals and labor violations. One example is Malaysia's East Coast Rail Link, which had to be renegotiated after a new Malaysian government was elected in 2018 and suspended it on concerns about costs and transparency.

The world around the BRI is changing, too. During the early years, U.S. President Donald Trump's "America First" slogan against globalization made the Chinese idea of connectivity and integration more appealing to many countries, said Xue Gong, an academic at Singapore's S. Rajaratnam School of International Studies.

However, BRI activity has declined sig-

nificantly since 2018, amid a slowdown in China's own economy and growing concerns about unsustainable debt in recipient countries, according to U.S. risk adviser Eurasia Group.

"For construction projects, the [average] deal size in 2022 was the lowest since the BRI was announced in 2013, with about \$321 million in 2022 compared to \$496 million in 2021," a report issued by Shanghai's Fudan University said. "Construction projects tended to be smaller, possibly as they rely on sovereign guarantees that became harder to secure due to tighter recipient government budgets and adjusted risk management models of Chinese financial institutions in the global economic uncertainty."

A decade on, China appears to be honing its pitch, shifting the emphasis from large-scale infrastructure projects to what it deems "small and beautiful" technology-based cooperation in recent years. Beijing has also pledged to cease fossil fuel investments in favor of clean energy development.

In a policy paper published last week, Beijing vowed to open up the BRI to more areas of cooperation and provide project financing based on local needs and conditions to avoid causing debt risk.

Still, questions persist over the enduring appeal of the BRI after the experience of the past 10 years.

China has said that over 140 countries are sending representatives to this week's forum. Apart from Putin, the guest list includes the leaders of Serbia, Sri Lanka and Thailand, among others. But the event was expected to attract only about a dozen heads of state and government after more than 35 attended the last BRI gathering in 2019.

"Unlike the success of the two BRI summits held several years ago, the expected low attendance at the upcoming third forum is a sign that the BRI may be losing its attraction," said Singapore's Gong. -- ERMD

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Three takeaways of 28th AGM of PEC at Quetta

Engineers, technologists, technicians have their separate domains: Engr. Najeeb Haroon

Chairman PEC says engineering education losing interest among students in Pakistan



By Manzoor Shaikh

The 28th Annual General Meeting (AGM) of the Pakistan Engineering Council (PEC) in Quetta had three major takeaways for those who traveled to Pakistan's mountainous province.

One, is that Balochistan's engineers are as closely connected and engaged with the engineering industry and education as their counterparts in the rest of the country.

Two that they, though smaller in numbers are well-versed and involved in engineering political streams running in the country and thus are the part of consultative process for the PEC Elections 2024.

Three, they are ready to defend the rights of engineers not only in Balochistan but also across the country.

This moot in a spacious hall held on 1st October turned out to be a forum raising

issues relating to young engineers and also a turn-system in the PEC elections for the office of the chairman so as to offer opportunity to the smaller provinces but failed to become Peshawar-like AGM held last year.

A large number of engineers from all over Pakistan participated in the moot. A sizeable number of young engineers from every corner of Balochistan along with the senior lot also showed up for the meeting.

The meeting presided over by the Chairman of Pakistan Engineering Council, Engr Najeeb Haroon was graced by Balochistan Governor Malik Wali Khan Kakar, Minister for Education Qadir Buzdar, Minister for Information Jan Achakzai, former Minister for Science and Technology Changaiz Jamali and Senator Ruksana Zubari.

Engr Najeeb Haroon shared the performance of the council for the last two years saying over 2,500 young engineers have been inducted into the industry under the Graduate Internship Program launched by the council. He further said this program

would continue in the future.

Haroon said the council is trying its level best to attract young people to engineering education in the wake that the trend to move to engineering is on the decline because of the emergence of other professions and fields in education. In order to do so the council has started STEM education to engage school students so that engineering education could be encouraged.

Haroon also shared the details of the efforts that the PEC has taken to tackle the issue of cost escalation of development projects in the country.

Talking about the issue of technologists, he said all three sections of engineering such as engineers, technologists, and technicians have their separate domains. They shall continue playing their part in the development of the country.

He also informed the moot of the performance of the PEC committees formed for working in various sectors.

Malik Wali Khan Kakar, Governor of

Balochistan said he was happy to see such a congregation of engineers in his province. 'We can make the best use of engineers for Balochistan. We appreciate their expertise.'

He said the engineers should play their part in renewable technologies and energy as Balochistan province is facing a very different situation in the power sector. We are facing days of load shedding in rural areas.

He called upon engineers to work for the people of Balochistan.

He touched on the quality of works and referred to issues developed in the dams during recent floods in Balochistan.

Being the Chancellor of universities, he stressed research and development in the universities of Balochistan.

He said it's time to computerize every government department and the engineers must guide the public sector.

He appreciated the VCs of public Universities of Balochistan for their focus on higher education. ■

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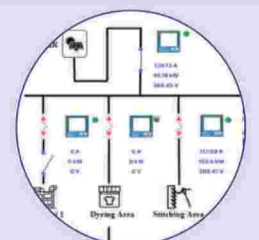
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Haier Pakistan-commercial AC Shines at 2023 Haier Overseas Entrepreneurs Summit in China

In the ever-evolving world of technology and innovation, the 2023 Haier Overseas Entrepreneurs Summit in China emerged as a pivotal event that brought together major brands and companies from around the globe. Colleagues from various global regions communication EMCs participated in the summit. The Haier Global Communications Summit stands as an annual gathering of industry leaders, tech innovators, and communication experts. It provides an exceptional forum to discuss emerging trends, share success stories, and explore the future of global communications. Located in China, it serves as a bridge between East and West, cultivating cooperation and synergy among participants from diverse corners of the globe. Centered around the theme of "Communication

Creates Value," the summit was divided into three sections: Innovation, Sharing, and Win-Win, exploring how to accelerate the construction of Haier Smart Home's global communications ecosystem. Amidst a sea of prominent participants, Haier Pakistan distinguished itself by securing a top-tier position at this

of September 2023 with the prior arrival of guests on the 17th of September. The guests were warmly welcomed by the Haier HQ team upon arrival in Qingdao City, China. All guests were then invited to join the Haier HQ facility the next day to witness the latest technology products being showcased over there.

products as per the latest industry standards and comfort. Haier Overseas RenDan-HeYi Strategy Communication Conference was held on the 19th of September. Guests or participants from all the over globe participated in it and shared their experiences and feedback for future

mercial Team secured a top-tier position amongst all the global guest partners. The team was considered premium finalists from global teams with their strong commitment towards brand and achievements in sales and growth of Commercial AC products, worldwide. This achievement underscores the brand's dedi-

company's reach in the Pakistani market. Customer-Centric Approach: Haier Pakistan's success is deeply rooted in its customer-centric approach. The brand's dedication to understanding the unique needs of Pakistani consumers and tailoring its products and services accordingly was a



prestigious summit. This article delves into the key highlights and achievements of Haier Pakistan at the summit, highlighting the brand's commitment to excellence and innovation. The 2023 Haier Global Communications Summit was successfully held on the 20th

Guests from all over the world have shown their keen interest in the Haier products and expressed their deep gratitude. The live interactive session being the guests continued for a long for discussing the products, latest innovations, and further research work in process for the upgradation of

prospects with Haier. A contingent of Haier Pakistan's Commercial Air Conditioning (CAC) Department including Mr. Salman Saleem (HOD Commercial AC) with their Chinese Counterparts Mr. Long Bin and Mr. Yu Zijing participated in the conference. The Haier Pakistan's Com-

mercial Team secured a top-tier position amongst all the global guest partners. The team was considered premium finalists from global teams with their strong commitment towards brand and achievements in sales and growth of Commercial AC products, worldwide. This achievement underscores the brand's dedi-

vibrant platform for sharing insights, fostering collaboration, and charting the future of global communications. Among the distinguished participants, Haier Pakistan emerged as a top-tier standout, showcasing the brand's unwavering commitment to excellence in the realm of global communication.

As Haier Pakistan emerges from the 2023 Haier Global Entrepreneurs Summit with accolades and newfound industry connections, the brand is poised for even greater success in the future. By continuously pushing the boundaries of innovation, embracing sustainability, and remaining committed to its customers, Haier Pakistan is well-positioned to shape the future of technology and communications in Pakistan. The summit served as a testament to the global impact of Haier Pakistan. The brand's remarkable achievements and contributions were acknowledged and celebrated among industry peers and leaders. As Haier Pakistan continues to lead the way in innovation, sustainability, and customer satisfaction, it stands as a shining example of success in the ever-evolving world of technology and communication.

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 Terry Redmond

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MUET, Archroma Pakistan Extend Agreement of Cooperation

On a momentous occasion at the Archroma Pakistan Ltd. facility in Jamshoro, Mehran University of Engi-

neering and Technology of Mehran University, and Mr. Mujtaba Rahim, the visionary CEO of Archroma Pakistan Ltd., came together to extend their Agreement of Mutual

Cooperation for another five years.

This significant partnership was sealed in the presence of Mr. Mark Garret, the distinguished President and Group CEO of Archroma

LLC, who expressed his unwavering support and confidence in the collaboration. The roots of this collaboration trace back to August 1, 2017, when the initial Memorandum of Understanding (MoU) was

signed at the main campus of Mehran University of Engineering and Technology in Jamshoro, Sindh, Pakistan. Now, this dynamic duo is ready to embark on another exciting chapter of cooperation. Both par-

ties are committed to fostering innovation through collaborative Research and Development (R&D) projects. They will continue to provide valuable training and mentorship for students, ensuring their holistic development. Work-

shops and seminars will be conducted, benefiting not only the university faculty but also the dedicated staff at Archroma. But the scope of cooperation doesn't stop there! The partnership will also see the organization of joint national and international events that promise to bring together experts and innovators from diverse fields. At the signing ceremony, the distinguished attendees included Prof. Dr. Kamran Ansari, Director of Engineering and the Focal Person for the Agreement, as well as Mr. Naeemuddin Qazi, Head of Operations, Mr. Ahsan Siddiqui, Head of Quality Assurance, and Mr. Sajid Ahmed Junejo, Manager Admin and IR at Archroma Pakistan Ltd.



neering and Technology and Archroma Pakistan Ltd. renewed their commitment to collaboration. Prof. Dr. Tauha Hussain Ali, the

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the US-Pakistan Center of Advanced Studies in Water, Prof. Dr. Zeeshan Khatri, Chairman of the Department of Textile Engineering, Dr. Awais Khatri, Associate Professor in the Department of Textile

This renewed partnership between Mehran University of Engineering and Technology and Archroma Pakistan Ltd. promises to be a beacon of innovation, education, and progress for the years to come. ■

Pakistan Cables clinches PSX Top 25 Companies Award 2022

second time in a row

Pakistan Cables won the PSX Top 25 Best Companies Award 2022 as announced in a statement by the Pakistan Stock Exchange earlier. The award is given by the PSX in recognition of the Company's excellent financial and managerial performance for the fiscal year 2022.

The Company's robust performance across the award

criterion some of which include CSR, Governance and Investor Relations, sustainability, profitability and liquidity remained exemplary during the reporting period.

Pakistan Cables has been recognized by the PSX for the second time in a row, overall winning the prestigious award eight times over the years.

About Pakistan Cables Ltd Founded in 1953, Pakistan Cables is the premiere

and most reputable cable manufacturer in Pakistan. Being the only wire and cable manufacturer listed on the PSX since 1955, it is also a member company of the Amir S. Chinoy group. The Company has the largest geographical footprint in Pakistan with presence in over 200 cities. It is ISO 9001:2015, ISO 14001:2015 and OHSAS 18001:2007 certified and various cables type tested by KEMA, Netherlands. ■

5th Monthly Technical Session of PES-IEEE- Karachi

The 5th monthly technical session of PES-IEEE- Karachi section held on 12th

October 2023 at sunset club on topic "Electrical Energy Optimization",

The renowned senior consultant Mr. Tahir Saleem conducted this technical session. He explained the importance of energy opti-

mization of any industries, Hotel, Large Building etc.

He covered the main topic Motor sizing and its efficiency consideration, Power quality impact on



energy conservation, Procedure for energy audit, Load factor, Tariff selection, Voltage unbalancing etc.

Total 33 No's professional engineers from dif-

ferent organization attended this technical session.

Very informative session emphasizing the need of energy conservation to reduce the energy cost

which is very important in the present situation.

Mr. Ishtiaq ul Haque chair PES, IEEE Karachi, thanks the presenter and the participants for a very lively and productive discussion in the present context of energy crisis. ■

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1st Intl Conference on Women Development in Engineering Science & Technology

A 2-day international conference was held at the U.S.-Pakistan Center for Advanced

and Technology, Jamshoro.

The purpose of the conference was to promote gender equality while fostering

vators.

The conference aimed to catalyze increased representation of women in engineering, science, and technology, leading to more diverse and inno-

The conference opened with inspiring keynote addresses from renowned thought leaders, including a welcome Address by Prof. Dr. Khadija Qureshi (Conference Chair),

(PEC), An address by Prof. Dr. Tauha Hussain Ali, Vice Chancellor Mehran UET Jamshoro, An address by the Chief Guest, Engr. Najeeb Haroon, Chairman Pakistan

were held in the areas of Chemical Engineering, Environmental Engineering, Civil Engineering, Architecture Engineering, Social Sciences, and so on. The sessions pro-



Studies in Water (USP-CAS-W), Mehran University of Engineering

knowledge sharing and collaboration among women professionals, researchers, and inno-

vative advancements in these fields.

Key Highlights

1. Inauguration Ceremony:

and an address by the Guest of Honor, Engr. Syed Abdul Qadir Shah, Chairman Pakistan Engineering Council

Engineering Council (PEC), and a keynote speech by Fathiah Binte Mohamed Zuki, Department of Chemical Engineering, Universiti Malaya. Their presentations set the tone for an intellectually stimulating event.

2. Plenary Sessions: The panel Discussions such as 'Women's Development in Engineering, Sciences, and Technology: A Meaningful Conversation and Insights' and 'Global Leaders Panel Discussion: Charting STEM Careers' were both informative and

provided a platform for researchers, experts, and practitioners to present their latest findings, innovations, and discoveries.

Keynote Speaker Sessions The keynote talks provided a focal point for addressing critical themes and trends, offering valuable insights from distinguished experts. These sessions not only set the tone for the entire conference but also served as a source of inspiration and knowledge for attendees, helping them gain a broader perspective and deeper

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engaging. They offered practical insights and enhanced attendees' skills in particular areas. The discussions were moderated by Dr. Shumaila Memon and Dr. Mamiko Reeves Respectively.

3. Parallel Sessions: During the 2 days of the conference, a number of sessions were delivered by various researchers and intellectuals. The sessions had varied categories like Technical sessions, keynote speaker sessions, guest speaker sessions, and paper presentations.

Technical sessions
Various Technical sessions

understanding of the subject matter. Following Keynote sessions were held:

- Building(s) for the future – questions vs answers by Prof. Dr. Griet Verbeeck.
- The Joys and Challenges of International Collaborations by Dr. Julie A. Sinclair.
- The Next Generation Battery: Paving the Way for a Sustainable Future by Dr. Haeyoung, Choi.
- Exploring Gender Equity in Elementary and Middle School Small Group STEM Activities by Dr. Jeanna R. Wieselmann
- Scoping an ethical framework for information systems while swimming in the academic waters Prof. Sule Yildirim Yayilgan
- Designing for Impact by Dr. Natalia Plechkova
- Water & Sediment Assessment of Water Bodies in Pulau Indah and Klang Port Terminal by Dr. Fathiah Binte Mohamed Zuki,
- Advanced Method for

Contd on page 09

Concluding Ceremony at Sir Syed University 7th Int'l Conference on Space Science & Technology



To mark World Space Week, the Mathematics Department of Sir Syed University of Engineering & Technology, organized a concluding session of the 7th International Conference on Space Science and Technology (ICSST-2023) in collaboration with the Institute of Space Science and Technology, University of Karachi. The event was attended by the Vice Chancellor, Prof. Dr. Vali Uddin, Registrar Syed Sarfraz Ali, Prof. Dr. Mir Shabbar Ali, Prof. Dr. Muhammad Asif, Dr. Asma, Prof. Dr. Rashid Kamal Ansari, Prof. Dr. Javaid Iqbal (KU), chairmen, faculty members, and others.

Addressing the session, Vice Chancellor Sir Syed University of Engineering & Technology (SSUET), Prof. Dr. Vali Uddin said that the rapid advancements in artificial intelligence, robotics, and material science showcased at this conference have opened up new frontiers in space exploration. These technologies are not only enhancing our understanding of the universe but also paving the way for ambitious missions to Mars, the establishment of lunar habitats, and the development of a sustainable space ecosystem.

Vice Chancellor of KU, Prof. Dr. Khalid Iraqi has already said in the opening session that advancements in space science and technology will not only help in exploring new things in our universe, but it is being used in many fields, such as for planning urban development, monitoring natural disasters, and others.

The KU Director ISST, Prof. Dr. Muhammad Jawed Iqbal shared that the main reason for organizing the international event is to create awareness about space science education in Pakistan.

Dean of the Faculty of Computing & Applied Sciences, Prof. Dr. Muhammad Asif said that the improvements in space technology would facilitate a better understanding of the climate and faster broadband connections. The advancements in space technology will revolutionize various industries. Organizations need to understand the potential of space technology and adapt to the changing industry trends to ensure a significant position in a competitive market. So many space activities are increasing day by day due to technological advancement and Artificial Intelligence is playing a significant role in spacecraft and entrepreneurship. Deep learning and space learning help analyze data gathered from space that helps understand the universe. Space technology is not just sending rockets and satellites into space; rather, it is transforming our daily lives, from climate solutions to internet access.

Prof. Dr. Rashid Kamal Ansari said that Space Technology is growing exponentially and turning sci-fi dreams into reality. The future of space exploration is bright due to the steady growth in the space exploration sector.

Dr. Asma Zafar, Chairperson of the Mathematics Department, said that astronomers are discovering new stars, planets, galaxies, and other celestial bodies to gain a better understanding of the creation of the universe.

Presenting a vote of thanks, Registrar Syed Sarfraz Ali said that universities might play a vital role in motivating students and faculty members to get knowledge of space and navigation work. The challenges of space exploration have sparked new scientific and technological knowledge of inherent value to humankind, leading to a better understanding of our universe and the solar system in which we live. ■

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Project: Zong compak Head Office Building Type: Office Location: Islamabad Capacity: 1,800 Ton				

Solutions for Intermittent Renewable Energy Sources

Engr. Dr. Muhammad Nawaz Iqbal

Little impact is felt on grid operations when tiny amounts of intermittent power are used. The grid infrastructure may need to be upgraded or perhaps completely redesigned if more intermittent electricity is used. Storage, improved interconnection between various variable sources to smooth out supply, the use of dispatchable energy sources like hydroelectricity, and overcapacity are all options for absorbing significant amounts of variable energy into the grid. The latter will ensure that there is enough energy produced even when the weather is unfavorable. Additional ties between the energy industry and the construction, transportation, and industrial sectors could be beneficial. Power demand and supply matching is a challenge that affects all power sources, not only intermittent ones. Existing power systems already have components of uncertainty, such as unexpected power plant outages and abrupt, significant fluctuations in demand. Despite the fact that power networks are currently built with considerable capacity above predicted peak demand to handle these issues, significant changes may be necessary to handle significant volumes of intermittent electricity.



operators to choose which of the available power sources to use the following day, and weather forecasting is used to determine the expected availability of wind and solar power. Despite the fact that wind power predictions have been used operationally for decades, the IEA is coordinating global cooperation to increase their accuracy as of 2019.

The amount of electricity produced at any one time by a specific plant will depend on the wind speed, air density, and turbine parameters because wind energy is a variable resource (among other factors). The wind turbines must be shut down to prevent damage if the wind speed is too high, and they cannot produce power if the wind speed is too low. While the output from a single turbine can change significantly and quickly as local wind speeds vary, the average power production becomes less variable as additional turbines are connected over larger and

larger areas. Solar energy is inherently erratic since it depends on the amount of sunshine present at a certain location and time to generate renewable electricity. Dust, fog, cloud cover, frost, and snow can all have an impact on the solar output, which fluctuates throughout the day and across the seasons. Many seasonal variables can be predicted quite well, and some solar thermal systems use heat storage to generate grid power for a whole day.

Dispatched generating that is being replaced by storage hydro, geothermal energy, nuclear energy, natural gas, biomass, or coal could be. It is less expensive to use nuclear or geothermal energy continuously as base load power than to start and stop these sources. Any excess power that is produced can be used to replace heating fuels, be stored, or be sold to another grid. When intermittents are not producing electricity, biofuels and conventional hydro can be preserved. In addition to demand patterns, which frequently cause big swings in the amount of electricity suppliers

deliver into the grid, all sources of electrical power are somewhat variable. The tools to impact supply and demand are well-developed, and grid operations procedures are designed whenever possible to match supply and demand at high levels of reliability. Large-scale, highly variable power generation may necessitate adjustments to current practices and new expenditures. In reality, partially loaded conventional plants that are already in place to offer response and reserve change their output to make up for variations in the power output from wind. The bigger overall changes at higher penetration levels will necessitate extra reserves or other forms of compensation, whereas low penetration levels of intermittent power may employ existing levels of responsiveness and spinning reserve. ■



A Lesson for B2B Sales (Specially for Young Sales Engineers) THE UNDERDOGS:

By Muhammad Tariq Haq

In the 1960s and first half of the 70s, the Pakistan cricket team had some great names. Each one of them was a superstar. The batsmen could anni-

hate the world's best bowling attacks at will. Bowling was also reasonably strong; we had the best wicket keeper in the world. The star-studded team had many all-rounders also. But this team was shy of winning. It used to lose from the brink of victory. Despite such a strong team, they were always treated as underdogs. They didn't have the killer instinct and would falter and fumble at the last moment. Then, in 1976, Mushtaq Mohammad instilled some winning habits and in the early 1980s a complete transformation took place. Imran Khan and Javed Miandad took over as captain and vice captain respectively. They completely changed the outlook of the team; it started to win from hopeless posi-

tions; they would pull out a victory from the jaws of the defeat every now and then. This transformation from the 70s to the 80s was the result of just one thing; PASSION TO WIN! The same thing happened perform the seven steps of personal selling viz. Prospecting, Pre-approach, Approach, Sales presentation, Handling objections, Closing, Follow-up etc with renewed energy, excitement and enthusiasm. You will



hilate the world's best bowling attacks at will. Bowling was also reasonably strong; we had the best wicket keeper in the world. The star-studded team had many all-rounders also. But this team was shy of winning. It used to lose from the brink of victory. Despite such a strong team, they were always treated as underdogs. They didn't have the killer instinct and would falter and fumble at the last moment. Then, in 1976, Mushtaq Mohammad instilled some winning habits and in the early 1980s a complete transformation took place. Imran Khan and Javed Miandad took over as captain and vice captain respectively. They completely changed the outlook of the team; it started to win from hopeless posi-

with India also. Kapil Dev, Sunil Gavaskar and then a battery of newcomers transformed India from minnows to a mighty force. Giving up, losing, surrendering became a thing of the past and winning became the new norm! The ascendancy of team India became so pronounced that it was no longer an underdog. On the contrary, its rivals became underdogs in mutual rivalry! The Pakistan and India contests even eclipsed the England and Aussies Ashes matches! From being an underdog in B2B sales, losing orders after orders to your more accomplished, more experienced competitors, you can start winning and even reverse the roles! With a change of attitude, you will

change your fortunes and change the fortunes of your company also. Remember a battle is first won in the mind and then actually on the battlefield! Unless you envision victory, you can't achieve it in real life. The transformation from underdogs to champions begins within. Consequently, dramatic improvements and breakthroughs in processes and their re-engineering have taken place! It all starts from painting a big picture; then packing it with the power of positive thinking, public relationships, persistence, patience, perseverance, passion, piety and prayers till you become unstoppable like Pakistan cricket under Imran! Each "P" is important, like the "Ps" in marketing! ■

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STORY OF THE OWNER OF TWO GARDENS (SURAH KAHF)

By Muhammad Tariq Haq

About two persons there is a narration
 One of them was poor; the other one with abundant provisions

Two gardens laden with grapevines and palm trees
 In between, there was vegetation

Both the gardens produced in abundance
 A river flowed between them, for irrigation

The rich person boasted to his poor companion
 I am in possession of great wealth and a large number of assistants

This is an outcome
 of my own efforts and intelligence

It will never come to an end
 and will remain forever in my possession

In the unlikely event of life after death,
 I will be in an even better position

The poor companion cautioned
 Don't associate anyone as God's companion and about
 resurrection don't be in suspicion

Attribute success to GOD, and thank Him for what has been given
 Otherwise it may all be retaken

So it happened
 The boastful person lost all his possessions and was left twisting
 his hands with humiliation

He ultimately had the realisation
 He should not have joined anyone as God's companion and
 instead remained obedient

1st Intl Conference on Women

Contd from page 6

Synthesizing Metal-Organic Framework Membrane for Gas Separation by Dr. Yeong Yin Fong.

Invited Talks: Guest speaker talks played a crucial role in the conference, bringing authoritative voices, fresh perspectives, and cross-disciplinary insights to attendees. They inspired, motivated, and provided invaluable networking opportunities, contributing significantly to the event's success. Following guest speaker talks were held:

- 'Applications of membrane Technology in CO2 Capture' by Prof. Dr. Arshad Hussain
- 'Road that I traversed as a women engineer: current research and future outlook' by Dr. Aqsa Shabbir
- Andragogy: Methods and Techniques of Teaching Adults by Dr. Ahmed Hussain

1. Training Workshop: An interactive workshop was held titled 'Unlocking the Power of Patents: A Comprehensive Talk on Intellectual Property and Women's Contributions'. The workshop was facilitated by Prof. Dr. Attiya Baqai, Professor, Department of Electrical Engineering, MUET, Jamshoro.

2. Networking Opportunities: The conference provided ample networking opportunities to the attendees and they had the pleasure of connecting with fellow professionals, sharing experiences, and building potential collabora-

tions.

3. Closing Ceremony: The closing ceremony of the conference was a momentous occasion, featuring several notable speakers who highlighted the conference's achievements and outlined its impact. The notable talks included a conference report by Dr. Khadija Qureshi (Conference Chair), an Address by Prof. Dr. Tauha Hussain Ali, Worthy Vice Chancellor, Mehran University of Engineering and Technology, Jamshoro, an Address by Guest of Honor, Dr. Tahmina Mangan Worthy Vice Chancellor Begum Nusrat Bhutto Women University, Sukkur, an Address by Chief Guest, Engr. Rukhsana Zuberi, Member of the Senate of Pakistan, Former Chairperson of Pakistan Engineering Council, and a Vote of thanks by Dr. Masroor Ahmed Abro, Conference Secretary.

Key Takeaways:
 • Enhanced Gender Inclusivity: The conference promoted greater gender

inclusivity in engineering, science, and technology, encouraging women's active participation and leadership.

• Knowledge Exchange and Collaboration: Attendees benefited from valuable knowledge exchange, networking, and collaborative opportunities.

• Empowerment and Inspiration: Participants left the conference inspired and empowered to overcome challenges, advance their careers, and contribute to positive change in their respective fields.

Conclusion:
 In summary, the 1st International Conference on Women Development in Engineering Science & Technology was a remarkable event that facilitated the exchange of knowledge, ideas, and experiences among professionals. The conference made a pivotal step towards gender equality, empowerment, and collaboration among professionals. ■

ER Bureau Chief at Quetta

We are pleased to share with our respected readers and viewers on our social media accounts that Mr. Jawed Langah, a senior journalist based in Quetta is now part of Engineering Review team. He will represent ER as Bureau Chief at Quetta. Editor



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صوبائی حکومت کے حکمہ پی این ڈی نے 2022 کارپس شیڈول جو بنا ہوا ہے اور 07 جولائی 2022 سے عمل درآمد شروع کروا کر

اور انکم ٹیکس لوگوں کو پریشان کر رہے ہیں۔ سیمینار سے انجینئر واصف نذیر جنرل سیکرٹری کنسلٹنگ انجینئر ذابیسوسی ایشن



پاکستان، محمد عامر سلیم ایڈووکیٹ صدر کراچی بار، افضل الرحمن سابق چیئرمین (کیپ)، انجینئر محمد شفیق ممبر سول انجینئر ذابیسوسی ایشن، انجینئر ننگ کونسل، انجینئر عارف حبیب نائب صدر انسٹی ٹیوٹ آف انجینئرز، انجینئر عبدالجبار شیخ (کیپ) سندھ کے آرگنائزراور چیئرمین انفراسٹرکچر کمیٹی (ایس پی سی سی آئی)، معید انور ایم کیو ایم کی رابطہ کمیٹی کے سرکن، ربیعان ہاشمی سابق چیئرمین ڈی ایم سی سینٹرل اور ایم کیو ایم پاکستان کی رابطہ کمیٹی، سینیئر ڈپٹی ایمن خان، سابق سینئر مہال احمد ہاشمی، نے بھی خطاب کیا۔



جائے ہیں جس کی وجہ سے جاری شدہ تعمیر و مرمت کے کاموں کو شیڈول ٹائم میں مکمل نہیں کر سکتے۔ انجینئر ارشد داد، سابق چیئرمین کیپ اور ممبر ایڈوائزر کی کمیٹی کا کہنا تھا کہ ہر افسر کو بتانا ہو گا کہ ہم بلڈنگ نہیں ہیں ہم کنسٹرکٹرز ہیں ہم صرف سروس پرووائڈرز ہیں کنسٹرکشن انڈسٹری ایک سروس انڈسٹری ہے جو ہم سے انویسٹمنٹ نہیں مانتی ہم اپنی سروس بیچتے ہیں پروڈکٹ نہیں نہ ہم گھر بنا کر بیچتے ہیں۔ ہم سرکاری اساتے بنانے میں اپنا کردار ادا کرتے ہیں ٹھیکیدار پیسے نہیں لگا تا جگہ گھر یا دفتر یا روڈ کی تعمیر ہوتی ہے پیسے اس کے لگتے ہیں ہمارے

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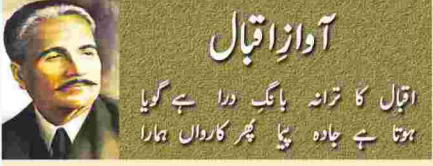
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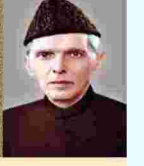
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کلوزے کلوزے کر رکھے ہیں۔ ہندوستان کے نقشہ پر مسلم ہندوستان
اور ہندو ہندوستان پہلے ہی سے موجود ہیں نہ معلوم اس کے متعلق
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کیے جائیں گے؟ اور وہ قوم کہاں ہے جس کی قومیت فنا کی جائے؟
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پاکستان میں بجلی کے استعمال میں گھریلو صارفین کا حصہ 47 فیصد، انڈسٹری کا 28 فیصد جبکہ زراعت اور کمرشل صارفین کا حصہ آٹھ، آٹھ فیصد ہے۔ صارفین کی اس شرح کو دیکھتے ہوئے ہونا تو یہ چاہئے تھا کہ سستی اور قابل تجدید توانائی یعنی سولر پاور کو فروغ دیا جاتا لیکن حقیقت یہ ہے کہ سولر سے پیدا کی جانے والی بجلی کا مجموعی پیداواری استعداد میں حصہ دو فیصد سے بھی کم ہے۔ اس کے مقابلے میں پاکستان اپنی ضرورت کی 59 فیصد بجلی تھرمل، 26 فیصد ہائیڈرو اور 9 فیصد بجلی نیوکلیئر پاور پلانٹ سے حاصل کرتا ہے۔ اس حوالے سے اگر گزشتہ پانچ سال کے اعداد و شمار کا جائزہ لیا جائے تو یہ حقیقت سامنے آتی ہے کہ 2018 سے 2023 تک بجلی کی تھرمل پیداوار میں اضافہ اور ہائیڈرو پیداوار میں کمی آئی ہے جبکہ قابل تجدید توانائی کی پیداوار میں اضافے کی شرح انتہائی سست ہے۔ پاکستان میں توانائی کا بحران

بجلی کے نرخوں میں حالیہ اضافے نے جہاں انڈسٹری کا پیہ روک دیا ہے وہیں صنعتکاروں، تاجروں، مزدوروں اور عام شہریوں کیلئے بجلی کے بلوں کی ادائیگی سب سے بڑا معاشی مسئلہ بن چکی ہے۔ یہ صورتحال ایک دن میں پیدا نہیں ہوئی بلکہ یہ گزشتہ تین دہائیوں کی بدانتظامی اور غلط پالیسیوں کا خمیازہ ہے جسے ہم آج بھگت رہے ہیں۔ سرکاری اعداد و شمار کے مطابق ملک میں بجلی کی مجموعی پیداواری استعداد 41 ہزار میگا واٹ ہے جس میں 10 ہزار 592 میگا واٹ ہائیڈرو، 24 ہزار 95 میگا واٹ تھرمل، 3503 میگا واٹ نیوکلیئر اور 2783 میگا واٹ بجلی دیگر ذرائع سے حاصل ہوتی ہے۔ تاہم اگست 2023ء کے دوران بجلی کی زیادہ سے زیادہ پیداوار کا حجم 25 ہزار 516 میگا واٹ ریکارڈ کیا گیا جو کہ ہماری مجموعی پیداواری استعداد سے تقریباً 15 ہزار 500 میگا واٹ کم ہے۔ اس صورتحال کا ایک اور پہلو یہ ہے کہ سردیوں کے موسم میں بجلی کی زیادہ سے زیادہ ضرورت 10 سے 12 ہزار میگا واٹ تک محدود ہو جاتی ہے یعنی ہماری مجموعی پیداواری استعداد کی 75 فیصد سے زائد بجلی کا کوئی مصرف نہیں رہتا۔

دوسری طرف نیشنل الیکٹریک پاور ریگولیٹری اتھارٹی (نہرا) کے اعداد و شمار کے مطابق جولائی 2023ء میں فرنس آئل پمپنی پلانٹس سے پیدا ہونے والی بجلی کی



اس وجہ سے بھی سنگین تر ہوتا جا رہا ہے کہ بجلی کی پیداوار کا زیادہ انحصار درآمدی تیل اور گیس باہر سے بجلی پر ہے۔ عالمی سطح پر تیل اور گیس کی قیمتوں میں اضافے کیساتھ ساتھ پاکستان کے آبی ذخائر سے بجلی کی پیداوار میں وقت گزرنے کیساتھ ساتھ کمی آرہی ہے۔ اسلئے توانائی کے موجودہ بحران کے پیش نظر قابل تجدید توانائی کے ذرائع سے بجلی کی پیداوار بڑھانے پر زیادہ زور دینے کی ضرورت ہے۔

سولر انرجی اس وقت جدید دنیا میں استعمال ہونے والے سب سے کم مہنگے توانائی کے ذرائع میں سے ایک ہے لیکن ہم تقریباً 600 میگا واٹ بجلی سولر سے حاصل کر رہے ہیں جو مجموعی پیداوار کا 1.6 فیصد ہے۔ ایک اندازے کے مطابق پاکستان میں توانائی کی طلب میں 2030ء تک آٹھ گنا اور 2050ء تک بیس گنا اضافہ متوقع ہے۔ ایسے میں سولر انرجی کے وسائل کو استعمال کرنا بہت ضروری ہو جاتا ہے کیونکہ پاکستان جغرافیائی طور پر اس خطے میں واقع ہے جہاں سال بھر سورج کی روشنی موجود رہتی ہے۔ پاکستان کا جغرافیہ اور ماحولیاتی حالات سولر انرجی کے زیادہ سے زیادہ استعمال کیلئے مثالی ہیں۔ توانائی کے بحران کو نبھانے کے وقت میں حل کرنے کیلئے بھی سولر انرجی انتہائی اہم ہے کیونکہ سولر پلانٹس اور پاور پلانٹس کوئی فضائی آلودگی یا گرین ہاؤس گیس پیدا نہیں کرتے بلکہ سولر انرجی کے استعمال میں اضافے اور دیگر ذرائع سے پیدا ہونے والی بجلی کے استعمال میں کمی سے ماحول پر مثبت اثر پڑتا ہے۔

قیمت 28.7 روپے فی یونٹ تھی۔ اسی طرح درآمدی مائع قدرتی گیس (ایل این جی) کی مدد سے پیدا ہونے والی بجلی 24.4 روپے فی یونٹ فروخت کی گئی۔ علاوہ ازیں ایران سے درآمد کی جانے والی بجلی کی قیمت بھی 10 روپے فی یونٹ سے بڑھ کر 23.6 روپے فی یونٹ ہو گئی۔ اسی طرح مقامی گیس کے ذریعے بجلی پیدا کرنے کی لاگت میں بھی 100 فیصد سے زیادہ اضافہ ہوا ہے جس کی وجہ سے اس کی قیمت پانچ روپے فی یونٹ سے بڑھ کر 13.6 روپے فی یونٹ ہو گئی جبکہ کونلے سے بننے والی بجلی کی قیمت 11.5 روپے فی یونٹ رہی۔

بجلی پیدا کرنے والے تمام ذرائع میں سب سے سستی بجلی نیوکلیئر پاور پلانٹس سے حاصل ہوتی ہے جس کی فی یونٹ قیمت 1.16 روپے ہے۔ نہرا کے مطابق تمام ذرائع سے پیدا ہونے والی بجلی 8.96 روپے فی یونٹ کے حساب سے بجلی کی تقسیم کار کمپنیوں کو فراہم کی گئی۔ تاہم بجلی کی تقسیم کار کمپنیوں کی جانب سے بجلی چوری، لائن لاسز، سرکاری ملازمین کو فراہم کی جانے والی مفت بجلی اور پاور پلانٹس کو کسٹمی پیمنٹس کی مدد سے جانے والی ادائیگیوں کا بوجھ صارفین پر ڈال کر بجلی کے نرخ دس روپے فی یونٹ سے بڑھا کر 30 سے 50 روپے فی یونٹ کر دیئے گئے ہیں۔ یہ اعداد و شمار اس بات کی غمازی کرتے ہیں کہ بجلی کی پیداواری لاگت، بجلی چوری اور لائن لاسز جتنے زیادہ بڑھیں گے اس کا اتنا ہی زیادہ بوجھ گھریلو صارفین کو برداشت کرنا پڑے گا۔ ان حالات کو دیکھتے ہوئے صنعتکاروں نے بجلی

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کنسٹرکٹرز ایسوسی ایشن آف پاکستان

تعمیراتی انڈسٹری کو درپیش مشکلات اور معاشی صورتحال پر سیمینار

ٹینڈرز کا عمل شفاف نہیں، "سسٹم" نے تباہ کر دیا، ود ہولڈنگ ٹیکس کے نام پر بلیک میل کیا جا رہا ہے، انجینئر اشفاق حسین شاہ

کنسٹرکٹرز ایسوسی ایشن آف پاکستان (کیپ) اور کراچی کنسٹرکٹرز ایسوسی ایشن (کے سی اے) کے اشتراک سے کراچی میں ایک سیمینار تعمیراتی انڈسٹری کو نمائندوں نے شرکت کی اور اپنے اپنے خیالات پیش کر سکتے آپ اچھے رٹس لے کر اچھے اور معیاری کام کریں انڈر بڈنگ کے کاموں سے ہمیں بھی آپ کی وکالت کرتے شرمندگی کا سامنا کرنا پڑتا ہے اپنے بچوں کو تعمیر کرنے ملک کا نام ہو گا ملک کے شہری مستفید ہونگے دعا دینگے تو اللہ پاک آپ کو اور ترقی دے گا۔ لہذا کرپٹ عناصر کی صف میں مت کھڑے ہوں۔



درپیش مشکلات اور پاکستان کی معاشی صورتحال کے موضوع پر منعقد ہوا جس میں ملک بھر سے مہمانوں جس میں کنسٹرکٹرز کے علاوہ انجینئرز، سٹیلٹیسٹس، بار کے کے چیئرمین انجینئر اشفاق حسین شاہ نے سیمینار سے خطاب کرتے ہوئے کہا کہ جب تک آپ اپنے حق کے لیے کھڑے نہیں ہونگے اور تعاون نہیں کریں گے ہم کچھ نہیں کر سکتے اور ملک کے اساسوں کی تعمیر صاف ستھرے اور معیاری کاموں سے کریں کنسٹرکٹرز اپنے کردار سے اپنے اندر تبدیلی لائیں پاکستان کے اساسوں کی معیاری حلال کھلائیں اور ملک کے اساسوں کی تعمیر صاف ستھرے آنے والے مہمانوں کو خوش آمدید کہتے ہوئے صوبہ میں ہونے والی سسٹم کے نام پر ہونے والی کرپشن اور سندھ اس سیمینار سے نعیم کاظمی وائس چیئرمین (کیپ) میں اس پر بہت کام کیا اب لوگوں کی شکایات آنا شروع ہونے لگیں نے لوگوں کو پریشان کیا ہوا ہے ہم نے اس پر ماضی بقیہ صفحہ 10

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New cyber algorithm shuts down malicious robotic attack



Australian researchers have designed an algorithm that can intercept a man-in-the-middle (MitM) cyberattack on an unmanned military robot and shut it down in seconds.

In an experiment using deep learning neural networks to simulate the behaviour of the human brain, artificial intelligence experts from Charles Sturt University and the University of

South Australia (UniSA) trained the robot's operating system to learn the signature of a MitM eavesdropping cyberattack. This is where attackers interrupt an existing conversation or data transfer.

The algorithm, tested in real time on a replica of a United States army combat ground vehicle, was 99% successful in preventing a malicious attack. False positive rates of less than 2% validated the system, demonstrating its effectiveness.

The results have been

published in IEEE Transactions on Dependable and Secure Computing.

UniSA autonomous systems researcher, Professor Anthony Finn, says the proposed algorithm performs better than other recognition techniques used around the world to detect cyberattacks.

Professor Finn and Dr Fendy Santoso from Charles Sturt Artificial Intelligence and Cyber Futures Institute collaborated with the US Army Futures Command to replicate a man-in-the-middle cyberattack on a GVT-BOT ground vehicle and

trained its operating system to recognise an attack.

"The robot operating system (ROS) is extremely susceptible to data breaches and electronic hijacking because it is so highly networked," Prof Finn says.

"The advent of Industry 4, marked by the evolution in robotics, automation, and the Internet of Things, has demanded that robots work collaboratively, where sensors, actuators and controllers need to communicate and exchange information with one another via cloud services.

"The downside of this is that it makes them highly vulnerable to cyberattacks.

"The good news, however, is that the speed of computing doubles every couple of years, and it is now possible to develop and implement sophisticated AI algorithms to guard systems against digital attacks."

Dr Santoso says despite its tremendous benefits and widespread usage, the robot operating system largely ignores security issues in its coding scheme due to encrypted network traffic data and limited integrity-

checking capability.

"Owing to the benefits of deep learning, our intrusion detection framework is robust and highly accurate," Dr Santoso says. "The system can handle large datasets suitable to safeguard large-scale and real-time data-driven systems such as ROS."

Prof Finn and Dr Santoso plan to test their intrusion detection algorithm on different robotic platforms, such as drones, whose dynamics are faster and more complex compared to a ground robot. -- SD

AI language models could help diagnose schizophrenia



The research, published in PNAS, aims to understand how the automated analysis of language could help doctors and scientists diagnose and assess psychiatric conditions.

Currently, psychiatric diagnosis is based almost entirely on talking with patients and those close to them, with only a minimal role for tests such as blood tests and brain scans.

However, this lack of precision prevents a richer understanding of the causes

of mental illness, and the monitoring of treatment.

The researchers asked 26 participants with schizophrenia and 26 control participants to complete two verbal fluency tasks, where they were asked to name as many words as they could either belonging to the category "animals" or starting with the letter "p," in five minutes.

To analyse the answers given by participants, the team used an AI language model that had been trained on vast amounts of internet text to represent the meaning of words in a similar way to humans. They tested whether the words people sponta-

neously recalled could be predicted by the AI model, and whether this predictability was reduced in patients with schizophrenia.

They found that the answers given by control participants were indeed more predictable by the AI model than those generated by people with schizophrenia, and that this difference was largest in patients with more severe symptoms.

The researchers think that this difference might have to do with the way the brain learns relationships between memories and ideas, and stores this information in so called 'cognitive maps'.

They find support for this theory in a second part of the same study where the authors used brain scanning to measure brain activity in parts of the brain involved in learning and storing these 'cognitive maps'.

Lead author, Dr Matthew Nour (UCL Queen Square Institute of Neurology and University of Oxford), said: "Until very recently, the automatic analysis of language has been out of reach of doctors and scientists. However, with the advent of artificial intelligence (AI) language models such as ChatGPT, this situation is changing.

"This work shows the potential of applying AI language models to psychiatry - a medical field intimately related to language and meaning."

Schizophrenia is a debilitating disorder that affects around 24 million people worldwide and over 685,000 people in the UK.

According to the NHS, symptoms of the condition may include hallucinations, delusions, confused thoughts and changes in behaviour.

The team from UCL and Oxford now plan to use this technology in a larger sample of patients, across more

diverse speech settings, to test whether it might prove useful in the clinic.

Dr Nour said: "We are entering a very exciting time in neuroscience and mental health research. By combining state-of-the-art AI language models and brain scanning technology, we are beginning to uncover how meaning is constructed in the brain, and how this might go awry in psychiatric disorders. There is enormous interest in using AI language models in medicine. If these tools prove safe and robust, I expect they will begin to be deployed in the clinic within the next decade." -- SD

Modular dam design could accelerate the adoption of renewable energy

Southwest Research Institute has developed a new modular steel buttress dam system designed to resolve energy storage issues hindering the integration of renewable resources into the energy mix.

The m-Presa modular steel buttress dam system facilitates the rapid construction of paired reservoir systems for grid-scale energy storage and generation using closed-loop pumped storage hydropower (PSH), cutting dam construction costs by one-third and reducing construction schedules by half.

Electric power systems use PSH for load balancing. The method uses the gravitational potential energy of water, pumped from a lower-elevation to a higher-elevation reservoir using low-cost, off-peak surplus electric power to run the pumps. During periods of high electrical demand, the stored water is returned to the lower reservoir, driving turbines to produce electric power. Although the losses from the pumping process mean it consumes more energy than it generates, the system creates value by providing more electricity during periods of peak demand, when electricity prices are highest, which mitigates the challenges associated with huge daily swings in intermittent, variable and carbon-free renewable energy, such as solar and wind power.

"Pumped storage hydropower accounts

for approximately 95 percent of all energy storage in the U.S., and modern PSH plants have a round-trip efficiency approaching 80-percent," said Dr. Gordon Wittmeyer, a hydrologist in SwRI's Chemistry and Chemical Engineering Division. "However, only one moderate-sized 40 MW PSH plant has been constructed in the past two decades in the U.S. Three factors stand in



the way of rapidly deploying PSH: cost to construct, time to construct and potential environmental impacts. The SwRI-developed m-Presa system addresses all three of these issues."

Cost factors that continue to deter new investment in PSH include large capital costs -- as much as \$5,000 per kW installed capacity -- and the lack of clear

energy storage pricing signals. The m-Presa™ design could reduce construction costs to \$1,500 per kW-installed capacity, making PSH competitive with other long-term energy storage modes.

Time to construct reservoirs is a significant cost component as well. It often takes 10 years to site, design, construct and commission a conventional PSH plant

age systems.

"We propose closed-loop pumped storage hydropower units by storing water in upper and lower reservoirs, impounded by buttress dams constructed from prefabricated structural steel modules," Wittmeyer said. "These structural steel modules can be transported on standard-sized flatbed trailers to allow rapid modular construction of 10- to 40-foot-high buttress dams that can enclose a wide range of surface areas and water volumes."

Potential environmental impacts of reservoir construction are another significant impediment to adoption of PSH when impounding a natural waterway. Potential environmental impacts associated with closed-loop PSH can be reduced or avoided if the upper and lower reservoirs are created by constructing fully enclosed dams separate from natural streams or rivers.

"The m-Presa system uses strong, long-lived steel buttress dams to create water impoundments that can store hundreds to thousands of MWh of energy to supply power during periods of peak demand and provide ancillary services for grid stability," Wittmeyer said. "A PSH unit using the m-Presa system can be constructed in less than half the time needed for traditional PSH units that use earthen embankment or concrete dams to impound water."

The m-Presa system will be featured at booth 313 at the Clean Currents Conference in Cincinnati from October 10-13. -- SD