

# FORTNIGHTLY ENGINEERING REVIEW

The voice of engineers

Founded by **Najam ul Hassan (Marhoom)**  
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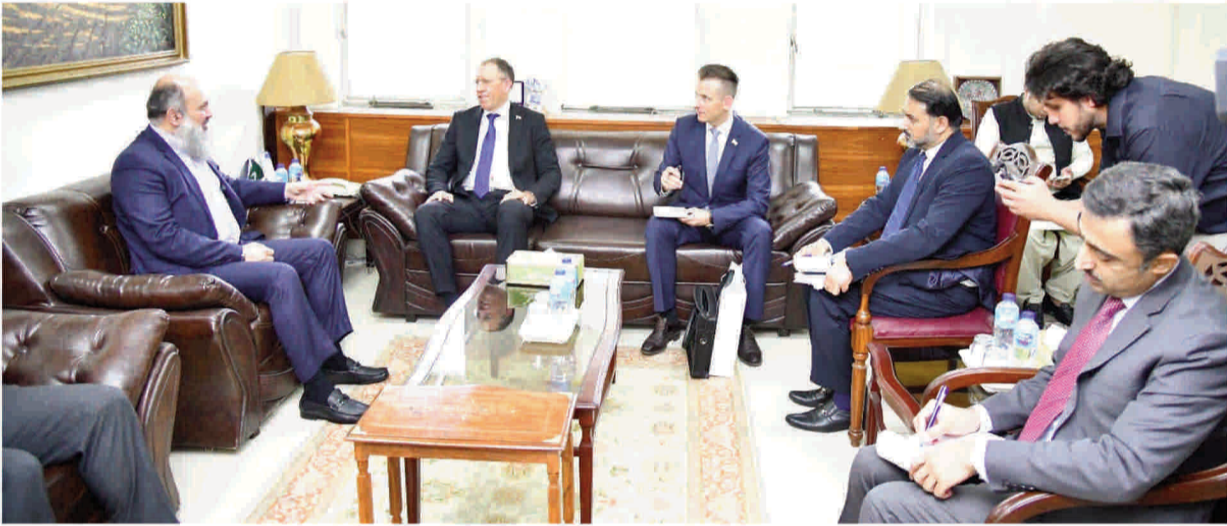
## Pakistan, Belarus Reignite Industrial Cooperation with Balochistan Plant Reactivation and Joint Ventures

Pakistan and Belarus have taken significant strides to reinvigorate bilateral industrial cooperation with a renewed focus on a previously delayed Belarus-backed industrial plant in Balochistan.

Originally associated with DMV and Omnigroup, the project is now poised for revival, signaling a broader commitment to strategic economic collaboration between the two countries.

The development came during a comprehensive meeting between Federal Minister for Commerce Jam Kamal Khan and Belarusian Ambassador Andrei Metelitsa in Islamabad.

Both dignitaries discussed an expansive agenda, including industrial project revival, textile partnerships,



labor cooperation, and procurement of heavy machinery.

At the heart of the discussions was the reactivation of the Belarus-support-

ed industrial plant in Balochistan, a key initiative that had previously stalled but is now regaining

momentum. Minister Kamal stressed the importance of utilizing existing infrastructure to reduce delays and deliver fast-track progress. "Efficiency comes from

using what's already in place. We aim for speed, impact, and sustainability," he stated.

The Minister also commended Belarus's sustained engagement in Pakistan's industrial development, particularly in tractor manufacturing. He noted encourag-

ing proposals from Pakistani entities such as HIT (Heavy Industries Taxila) and the Shahzad Group,

urging all stakeholders to prioritize initiatives with near-term deliverables aligned with Pakistan's industrialization roadmap. Pakistan-Belarus Textile

### Joint Venture in Focus

A major highlight of the meeting was the proposed Pakistan-Belarus joint venture in the textile sector. Minister Kamal underscored the need for Belarus to take the lead through financial investment and technological support, given the current challenges faced by local investors in the sector. He emphasized that such a partnership could transform Pakistan's textile landscape, particularly in areas such as spinning machinery and modernization of production lines.

A Belarusian delegation and senior officials from Pakistan's Ministry of Commerce, including the Additional Secretary, have already inspected the proposed site. To support this initiative, the National Tex-

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## Pakistan, Belarus Reignite Industrial Cooperation with Balochistan Plant Reactivation and Joint Ventures

*Contd from page 1*  
tile University may also be engaged to offer technical assessments and consultancy services.

### Cotton Shortage & Alternative Sourcing

The meeting also addressed Pakistan's mounting cotton shortfall, with domestic production standing at just 5.5 million bales, significantly short of the 13-15 million bales required to meet industrial demand. While the United States remains a key supplier, geopolitical uncertainties and sanction-related risks have prompted Pakistan to diversify its sourcing options. Minister Kamal expressed interest in exploring imports from Tajikistan and Kazakhstan, noting that regional cooperation could help bridge the critical supply gap.

### Labour Mobility and Skills Exchange

Labor collaboration emerged as another key discussion point. Minister Kamal highlighted Belarus's labor shortage, presenting an opportunity for Pakistan to export skilled manpower. Currently, around 200 Pakistani workers are

employed in Belarus, and the potential exists to expand this number significantly, particularly in manufacturing and services sectors.

Ambassador Metelitsa expressed optimism over expanding people-to-people and business-to-business exchanges. He reaffirmed Belarus's readiness to provide technology transfer, engineering support, and workforce training, all of which are critical to industrial modernization.

### Machinery Procurement and Joint Working Mechanism

Both sides explored procurement of Belarusian industrial equipment, including trucks, dumpers, excavators, and electric buses—machinery that has already proven effective in Pakistan's coal and cement sectors. These high-performance vehicles could play a key role in expanding Pakistan's infrastructure and logistics capacity.

Minister Kamal supported the idea of holding an online Joint Working Group (JWG) meeting to monitor

progress on bilateral projects. He noted that Pakistan's Economic Affairs Division (EAD) is actively following up on multiple fronts to ensure the timely realization of planned initiatives.

### Path Forward: Strategic, Sector-Wide Engagement

In closing, Minister Kamal reiterated Pakistan's resolve to deepen sector-specific collaboration with Belarus. He called for timely follow-ups, enhanced participation in trade exhibitions, and the strengthening of institutional partnerships. "We regard Belarus as not only a strategic ally but also a trusted collaborator in building Pakistan's industrial base and unlocking new economic opportunities," he said.

The meeting concluded with expressions of mutual appreciation and a shared commitment to translating bilateral goodwill into tangible results—ushering in a new era of industrial partnership and green growth. - ERMD

## Chinese Firm to Establish Super Mini Truck Assembly Plant in Karachi: Sindh Minister

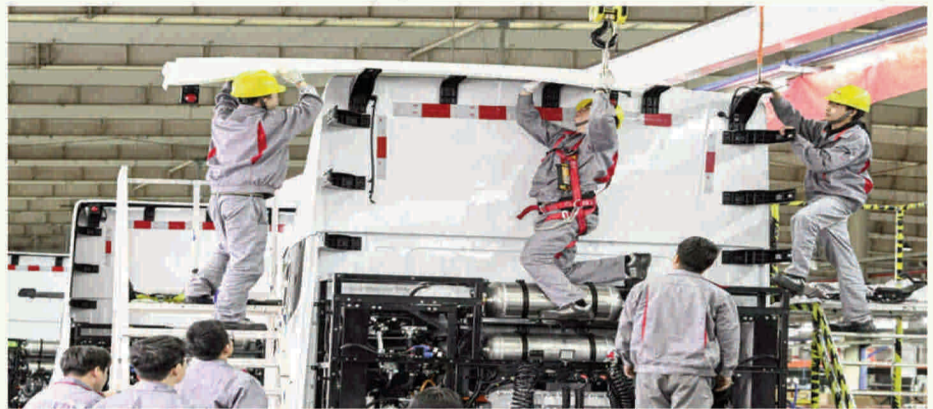
In a significant step toward industrial development and Pakistan-China technological collaboration, Chinese investors have agreed to establish a Super Mini Truck assembly plant in

assembly facility is expected to boost industrial activity in Karachi and enhance Pakistan's automotive sector through local manufacturing and job creation.

The minister highlighted future plans and revealed that electric vehicle (EV) charging stations will be set

and technological exchange," Memon remarked. "It is affordable, accessible, and environmentally compatible — designed to meet Pakistan's rising need for light commercial vehicles."

He further emphasized that the Karachi assembly



Karachi, Sindh's Senior Minister Sharjeel Inam Memon announced during a launch event in Bozhou, China, reports said.

Speaking at the Super Mini Truck unveiling ceremony — a joint innovation by Chery Holding and Peddy Technology Company Limited — Memon said the upcoming plant will offer wide-ranging benefits for local business groups and individual entrepreneurs. The

up across Sindh to support the growing demand for environmentally friendly transportation.

Describing the Super Mini Truck as a revolutionary product, Memon noted its unique versatility — the vehicle can be converted into a super mini car, offering a flexible and sustainable mobility solution for both urban and rural logistics.

"This vehicle exemplifies the strength of Pakistan-China industrial cooperation

plant would play a key role in accelerating local manufacturing, enabling technology transfer, and positioning the city as a potential automotive manufacturing hub in the region.

Memon concluded by assuring full support from the Sindh government, including regulatory facilitation, infrastructure development, and workforce training, to ensure the project's successful execution. -- ERMD

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## Engineering Review

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## Mari Energies Wins 10 New Oil and Gas Exploration Blocks in Competitive DGPC Bid Round

**M**ari Energies Limited (MariEnergies) has been provisionally awarded 10 new oil and gas exploration blocks by the Directorate General of Petroleum Concessions (DGPC), according to a notification shared with the Pakistan Stock Exchange (PSX) today.

The awards were granted following the Pakistan Onshore Exploration & Production (E&P) Bid Round 2025,



The formal award of these petroleum rights is subject to the following conditions:

Issuance of Petroleum Exploration Licenses by the Government

Signing of Petroleum Concession Agreements

Execution of Joint Operating Agreements among JV partners

Completion of other legal and procedural formalities

MariEnergies stated that this strategic expansion aligns with its long-term goal of growing its exploration acreage to unlock new hydrocarbon resources and enhance Pakistan's energy security and self-sufficiency. — ENGINEERING REVIEW

Sr.	Name	Province	Operator (Working Interests)	JV Partners (Working Interests)
1.	Ziarat North	Balochistan	MariEnergies (33.16%)	OGDCL (24.87%) PPL (24.87%) TPOC (10%) GHPL (7.10%)
2.	Ahmad Wal	Balochistan	MariEnergies (60%)	OGDCL (40%)
3.	Padag	Balochistan	MariEnergies (100%)	-
4.	Chagai	Balochistan	MariEnergies (100%)	-
5.	Dalbandin	Balochistan	MariEnergies (100%)	-
6.	Merui	Balochistan	MariEnergies (100%)	-
7.	Merui West	Balochistan	MariEnergies (100%)	-
8.	Kalat South	Balochistan	PPL (40%)	OGDCL (30%) MariEnergies (30%)
9.	Khiu-II	Punjab	OGDCL (60%)	MariEnergies (40%)
10.	Sukhpur-II	Sindh	Prime (25%)	OGDCL (30%) MariEnergies (30%) TPOC (15%)

held on April 30, 2025, where various E&P companies submitted competitive bids based on committed work units.

Out of the ten awarded blocks, MariEnergies will operate seven blocks independently, while par-

ticipating as a joint venture (JV) partner in three others. The JV partnerships involve leading industry players such as Oil and Gas Development Company Limited (OGDCL), Pakistan Petroleum Limited

(PPL), Prime Global Energies Limited (Prime), Government Holdings (Private) Limited (GHPL), and Turkish Petroleum Overseas Company (TPOC).

Details of the Awarded Blocks:

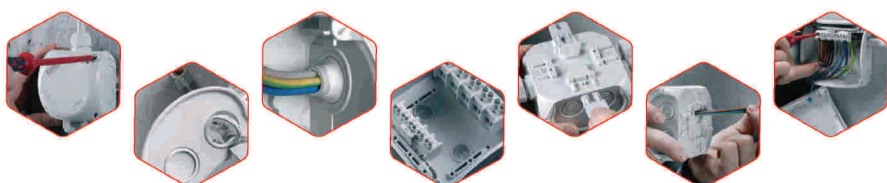
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## CDWP Clears Rs249 Billion Worth of Development Projects, Refers Major Schemes to ECNEC

The Central Development Working Party (CDWP) has cleared 10 development projects worth Rs249 billion.

The CDWP, which met under the chairmanship of Federal Minister for Planning, Development & Special Initiatives and Deputy Chairman of the Planning Commission Ahsan Iqbal, approved four projects with a cumulative cost of Rs21.83 billion at the CDWP level, while six projects, amounting to approximately Rs227.34 billion, were recommended to the Executive Committee of the National Economic Council (ECNEC) for final consideration/approval.

A project related to information technology, namely the "Expansion of Safe City, Islamabad (New)" worth Rs7,499.339 million, was approved by the CDWP. The project is proposed to be financed through the Public Sector Development Programme (PSDP). Currently,

35% of Islamabad is under surveillance through the Safe City project. After completion, all major areas of the city will be covered.

A project in the higher education sector, namely the "Establishment of National Center for Quantum Computing (NCQC)" worth Rs3,318.363 million, was approved by the forum. Another project related to the higher education sector, namely "Higher Education Development in Pakistan (HEDP) (Revised)," was referred to ECNEC with a revised cost of Rs21,190.777 million. Under this project, tertiary education in Pakistan includes universities and affiliated colleges (ACs), with the former overseen by the Higher Education Commission (HEC) and the latter jointly managed by universities and provincial departments.

Similarly, six projects related to the transport and communication (T&C) sector were also considered. These included the "Dualization of Sargodha-Khushab-Mianwali Road (60.43 km) in District Khushab (Revised)," which was referred to ECNEC for further consideration at a revised cost of Rs11,806.516 million. The project envisages the construction/dualization of a

revised cost of Rs21,190.777 million. Under this project, tertiary education in Pakistan includes universities and affiliated colleges (ACs), with the former overseen by the Higher Education Commission (HEC) and the latter jointly managed by universities and provincial departments.

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## Dr. Altaf Sial Honoured as Meritorious Professor and Receives IEP Distinguished Engineer Award

Renowned academic and engineering education advocate, Dr. Altaf Sial, has been conferred with the prestigious "Institution of Engineers Pakistan (IEP) Distinguished Engineer Award" in recognition of his outstanding achievements and unwavering commitment to the field of engineering.

acknowledges Dr. Sial's sustained excellence, leadership, and service to both the profession and the broader community. With decades of experience in engineering education, research, and development, Dr. Sial has played a pivotal role in shaping academic standards and promoting innovation across the engineering sector in Pakistan.

In his remarks, Dr. Sial expressed deep gratitude for the honour, stating, "I am truly humbled to receive the IEP Distinguished



The award was presented by the Chairman and office bearers of IEP during the celebration of the 77th IEP Foundation Day, held at the IEP Karachi Center.

In addition to this high honour, Dr. Altaf Sial was also celebrated for his exemplary role in academia, being recognized with the title of "Meritorious Teacher"—a testament to his impactful contributions to engineering education and mentorship of future generations.

The IEP Distinguished Engineer Award

Engineer Award and be recognized as a Meritorious Teacher. These accolades inspire me to continue my journey of empowering students and contributing to the advancement of engineering in Pakistan."

Dr. Altaf Sial's recognition marks a significant moment for the engineering community, reflecting the vital importance of educational leadership in national development and technological progress. ■

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## IEEEP Nawabshah Centre to Host 3rd National Student Symposium on May 28-29

The Institute of Electrical and Electronics Engineers Pakistan (IEEEP) Nawabshah Centre is all set to organize the 3rd National Student Symposium (IEEEP-NSS 2025) on May 28-29, 2025, hosted by Quaid-e-Awam University of Engineering, Science & Technology (QUEST), Nawabshah.

Themed around innovation, research, and sustainable development, the symposium aims to unite final-year and recently graduated students from

various universities across Pakistan, particularly from the disciplines of electrical, electronics engineering, and computing. The event provides a platform for young researchers and innovators to showcase cutting-edge ideas and contribute toward the Sustainable Development Goals (SDGs).

According to the organizers, the deadline for abstract submission was May 10, 2025. The symposium will serve as a dynamic knowledge hub fostering discussion on technological advancement and sustainable innovation.

Who Can Join?

Students in their final year or those who have recently graduated in relevant engineering and computing fields are invited to participate and submit their research abstracts.

Perks for Participants  
Gold, silver, and bronze medals for the top three papers

Cash prizes and certificates for all authors/presenters

Networking opportunities with academia and industry leaders

The symposium is spearheaded by Prof. Dr. Abdul Sattar Saand, Chairman of IEEEP Nawabshah Centre and Chief Organizer of IEEEP-NSS 2025. - ER

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## International Steels Limited Commissions 6.4 MW Solar Power Project at Karachi Facility

International Steels Limited (ISL) has successfully completed and commissioned a 6.4 MW solar power project at its manufacturing facility in Karachi.



The company disclosed the development in a notice to the Pakistan Stock Exchange (PSX), confirming that the solar plant is now fully operational.

"This initiative aligns with International Steels Limited's long-term sustainability strategy, reinforcing our commitment to energy efficiency, environmental responsibility, and cost optimization," the statement said. The project

is expected to generate significant operational savings while contributing to a reduced carbon footprint.

Company Profile: International Steels Limited is one of Pakistan's

leading producers of flat steel products, including cold rolled, galvanized, and color-coated steel. Headquartered in Karachi, the company plays a key role in supporting Pakistan's construction, automotive, and home appliance industries. ISL is listed on the Pakistan Stock Exchange and is recognized for its focus on innovation, quality, and sustainability. — ENGINEERING REVIEW

## Lucky Cement Fires New Clinker Line in Iraq, Consolidates Global Production Capacity

Lucky Cement Limited has announced the successful firing of a new clinker production line at its joint venture, Najmat Al-Samawah (NAS), located in Samawah, Iraq.

The company shared this development in a disclosure to the Pakistan Stock Exchange (PSX) under Sections 96 and 131 of the Securities Act, 2015 and Regulation 5.6.1 of the PSX Regulations.

The new clinker line has a production capacity of 1.82 million tons per annum (MTPA). This marks a key milestone in the company's overseas expansion strategy. The development follows Lucky Cement's earlier notice dated May 18, 2023, which outlined its plans to expand production at NAS.

Additionally, a cement grinding plant with a production capacity of 0.65 MTPA is also under construction at NAS. The company noted

that construction is progressing rapidly and commissioning is expected within the first half of FY2026.

Lucky Cement stated that the clinker capacity expansion will increase its market share in Iraq by ensuring a stronger supply of cement to the local market upon commissioning of the grinding plant. Furthermore, surplus clinker produced at the facility will be marketed and sold domestically within Iraq.

Upon completion of these initiatives, the consolidated production capacities of Lucky Cement Limited — across domestic and international operations — will total 21.48 MTPA, as outlined in the table below:

Lucky Cement emphasized that these additions are aligned with the company's long-term vision of expanding its production footprint and supporting Pakistan's energy security and economic growth while continuing to strengthen its international presence. — ENGINEERING REVIEW

## CDWP Clears Rs249 Billion Worth of Development Projects, Refers Major Schemes to ECNEC

*Contd from page 4*

60.43-km long, 7.31-meter wide, four-lane dual carriageway from Khushab to Mianwali.

Another T&C project, namely the "Development of a Controlled Access Corridor Facility from Niazi Interchange to Babu Sabu Interchange, Lahore," worth Rs10,842.253 million, was also referred to ECNEC for further consideration.

A project in the T&C sector, namely the "Dualization of Road from Gujranwala to M-2 Interchange at Kot Sarwar via Hafizabad (Length 70.5 km) (Revised)," was referred to ECNEC at a revised cost of Rs13,230.672 million. A project of Pakistan Railways, namely the "Rehabilitation of Track Maintenance Machines (Revised)," worth Rs5,312.876 million, was approved by the forum.

A project titled "Reconstruction of National Highway N-5 under Pakistan's Resilient Recovery and Reconstruction Framework Project, Phase-I (210 km)," worth Rs155,408.403 million, was also referred to ECNEC. The project is proposed to be financed through foreign funding on a 90:10 sharing basis. The Asian Infrastructure Investment Bank (AIIB) will provide 90% of the funding,

while 10% will be financed through the PSDP.

The PC-I of Phase-I involves the reconstruction, rehabilitation, and conversion of a 210-kilometre stretch of the N-5 (GT Road) from a four-lane to a six-lane dual carriageway. Phase-I comprises two sub-phases: Phase I-A and Phase I-B. Phase I-A, spanning 141 kilometers, includes sections from Ranipur to Rohri, Rawalpindi to Hassanabdal, and Nowshera to Peshawar. Phase I-B, covering 69 kilometers, includes the Lahore to Gujranwala section and the Nai Baran Bridge.

Another T&C sector project presented in the meeting, namely the "Dualization of Road from Chishtian to Chak No. 46/3R via Dahmawala (41.154 km), including a Two-Lane Link Road from Dahmawala to Chak 175M (4.859 km) (Revised)," worth Rs14,859.054 million, was also referred to ECNEC for further consideration. The project will be jointly financed by the federal government and the Government of Punjab on a 50:50 cost-sharing basis.

Finally, a project related to the environment sector, namely the "IPF Component for Punjab Clean Air Program (PCAP)," worth Rs5,700.351 million, was approved by the forum. ■

## Lt. Gen (Retd) Anwar Ali Hyder Appointed Chairman of Agritech Limited

Agritech Limited has announced the appointment of Lt. Gen Anwar Ali Hyder HI (M) (Retd) as the new Chairman of the Board of Directors, effective May 5, 2025.

He succeeds Mr. Shahid Iqbal Choudhri.

The company has formally notified the Pakistan Stock Exchange (PSX) of this leadership change and requested that the TRE Certificate Holders of the Exchange be informed accordingly.

Agritech Limited is a leading company in Pakistan's agriculture sector, focused on the manufactur-



ing and marketing of urea and phosphate fertilizers. The company plays a vital role in enhancing agricultural productivity by providing farmers with quality nutrients and sustainable farming

solutions. Agritech continues to contribute to the country's food security and economic development through its innovative and responsible business practices. — ENGINEERING REVIEW

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# VRF Conference in Riyadh by CPI Industry A Milestone for Sustainable Cooling Technologies under Saudi Vision 2030

By Engr. Javeria Asad, Riyadh, Saudi Arabia

The “9th Middle East VRF Conference” was held in the Saudi capital, Riyadh, under the auspices of CPI Industry. The conference focused on the challenges of climate change and the promotion of sustainable HVAC (Heating, Ventilation, and Air Conditioning) technologies. Experts, consultants,

event and discussed solutions for energy efficiency and environmental protection through the latest VRF (Variable Refrigerant Flow) technologies.

Aligned with Saudi Vision 2030, the conference highlighted the role of VRF technology in supporting Saudi Arabia’s green initiatives and sustainable development goals.

in hot regions has become a necessity. The conference showcased cutting-edge VRF systems capable of reducing energy consumption by up to 40%. In Saudi Arabia and other Gulf countries, more than 70% of electricity consumption during the summer is attributed to air conditioning. In this context, advanced VRF systems not only offer significant energy savings

ipation from the Pakistani company Windmason Arabia and Bait Al-Salat as strategic knowledge partners, both of which have played a vital role in promoting HVAC technology in the region.

Midea Group, Zamil, Samsung, and Mekar air conditioning units participated in the event as sponsors.

The speaker lineup featured industry authorities



industry leaders, and government officials attended the

Climate change experts emphasized that the installation of smart cooling systems

but also help mitigate the impacts of climate change. The event featured partic-

including Ubaidullah Khaja Mohamed Siddiqui (Tatweer), Mohamed Yassen (President, Saudi ASHRAE), Dr. Iyad Al-Attar (Cranfield University), Anas Alfar (Husain & Al Hassan G. Shaker Bros.), Yazan Al Zyoud (Samsung Electronics), and Shakeel Ahmed Kayani (Windmason Arabia), who delivered an engaging session on Indirect Evaporative Cooling (IDEC) in extreme climates.

Two major panel discussions were held during the conference. The first, titled “Technologies That Enable Growth of the VRF Market in the Kingdom,” featured in-depth conversations on refrigerant technology, AI integration, Building Energy Management Systems (BEMS), smart grid connectivity, and digital twins.

The second panel, “How VRF Systems Can Be Used as Part of a Broader Strategy to Improve Health and Safety During Pandemics,” explored topics such as indoor air quality, UV-C integration, pathogen-specific filtration, and the role of VRFs in hospital and educational environments. These panels emphasized the relevance of VRF systems in building resilience against health crises while ensuring energy efficiency.

Frédéric Paillé, Co-Founder and Commercial Director of CPI Industry, led the Sponsor Recognition Ceremony, acknowledging the critical support of industry partners in making the event a success. The conference also featured a vibrant exhibition space where attendees engaged with technology providers, observed product demonstrations, and explored partnership opportunities. ■

# MUET Goes Global: Strengthening International Academic Partnerships

In a significant step toward expanding global academic ties, Prof. Dr. Tauha Hussain Ali, Vice Chancellor of Mehran University of Engineering & Tech-

ration, including:  
•Graduate-level research cooperation  
•Postdoctoral exchange programs  
•Strategic faculty partnerships and knowledge sharing  
Both institutions



nology (MUET), Jamshoro, and Prof. Dr. Bhawani Shankar Chowdhry, Advisor (H) for International Collaboration, held a high-

expressed strong interest in fostering long-term collaboration that supports innovation, academic excellence, and global knowledge exchange.

This meeting reflects



level academic meeting with Dr. Mohamed Lachemi, President & Vice Chancellor of Toronto Metropolitan

MUET’s ongoing commitment to global engagement and its vision to evolve into a world-class research and innovation varsity through strategic international partnerships.



University (TMU), Canada.

Prof. Dr. Cory Searcy, Assistant Vice President, International at TMU, was

**Prof Chowdhry Empowers Global Collaboration**

Prof Bhawani Shankar Chowdhry, Sitara-E-Imtiaz, Distinguished National Professor and Advisor International Collaboration Development MUET, has been appointed an Invited Professor at the prestigious University of Oradea, Romania.

This recognition fuels his passion for building bridges across borders and advancing Global Collaboration Development. He is excited to work alongside brilliant minds to foster innovation, knowledge exchange, and lasting international partnerships. He said he is grateful to the University of Oradea for this opportunity and inspired to continue making a global impact! ■



also present at the meeting. The discussions were highly productive, focusing on potential areas of joint academic and research collabora-

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# Pakistan, China Explore Local Production of Medical Equipment and Technologies to Strengthen Health Sector

**O**n the sidelines of the ongoing 77th World Health Assembly, Pakistan has taken a strategic step to explore joint production of medical equipment and advanced health technologies in collaboration with China, signaling a new chapter in bilateral health cooperation.

Federal Minister for Health, Mustafa Kamal, held a high-level bilateral meeting with the Minister of Health of the People's Republic of China, where both sides discussed deepening their partnership in the health sector. The discussions centered around local manufacturing of vaccines, medical devices,

and technologies aimed at bolstering Pakistan's health-care infrastructure and reducing reliance on imports.

## Highlighting the historic

under its broader healthcare reform agenda. “We are focused on building domestic capacity for vaccine manufacturing, medical equipment

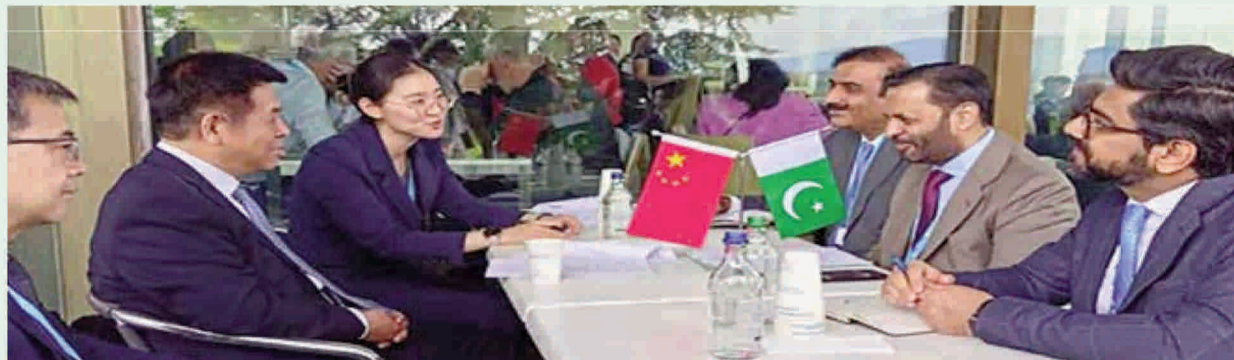
nology transfer, and joint research and innovation initiatives. Kamal noted that such partnerships are vital to achieving self-sufficiency in

mitment to supporting Pakistan in its efforts to develop a self-reliant health system. He underlined the importance of technology sharing, train-

gible cooperation,” said Kamal. “Under the Prime Minister’s guidance, we are building a health system that is robust, resilient, and innovation-driven.”

The discussions reflect Pakistan's proactive health diplomacy and its resolve to establish strategic partnerships aimed at enhancing local production, improving access to quality care, and ensuring long-term sustainability in the health sector.

As the World Health Assembly continues, Pakistan's engagement with China stands as a strong signal of its commitment to building collaborative, forward-looking solutions to meet the country's evolving healthcare needs. - ERMD



and strategic relationship between the two nations, Kamal remarked, “The Pakistan-China friendship is unique. Our mutual trust and shared vision pave the way for impactful collaboration—especially in the health sector.”

He emphasized that Pakistan is prioritizing the localization of medical production

production, and the integration of new technologies in healthcare delivery," he said.

The meeting also explored avenues for collaboration in areas such as traditional medicine, health tech-

critical healthcare resources and strengthening Pakistan's resilience against future health emergencies.

The Chinese Health Minister welcomed the initiative and reaffirmed China's com-

ing programs, and industry linkages as part of a broader vision to advance health outcomes in both countries.

“This meeting marks a significant step in transforming goodwill into tan-

# Pakistan's IT Exports Soar to \$3.5 Billion Amid Economic Stabilization and Digital Transformation

Federal Minister for Information Technology and Telecommunication Shaza Fatima Khawaja announced that Pakistan's IT exports have crossed \$3.5 billion in the first ten months of FY2024-25, marking a major milestone in the country's digital economy and showcasing resilience amid global economic headwinds.

Speaking to the media, the minister emphasized that Pakistan has moved from the edge of economic instability to a path of sustainable growth and digital progress under the leadership of Prime Minister Shehbaz Sharif. "Strong governance, coordinated economic policies, and strategic digital reforms have revitalized investor confidence and accelerated the pace of IT exports," she said.

Between July 2024 and April 2025, Pakistan's IT sector brought in over \$3.5 billion in total exports, with \$3.14 billion generated from core IT services alone. She highlighted that the IT sector continues to outperform other service sectors, boasting a trade surplus of approximately \$2.3 billion — the highest in its category.

Despite global challenges such as declining demand and restrictive trade environments, Pakistan's digital exports have remained strong. "This performance is the outcome of macroeconomic stability and focused initiatives like the Special Investment Facilitation Council (SIFC), which have significantly improved the investment climate," she said.

Shaza Fatima also lauded the success of Pakistan's first-ever Digital FDI Forum, held in

collaboration with the Saudi-based Digital Cooperation Organization (DCO). The event attracted over 500 attendees, including 100 international investors and global tech CEOs, and resulted in concrete foreign investments worth \$700 million into Pakistan's digital ecosystem.

"This is not just about MoUs — these are signed investment agreements that will fuel our IT growth for years to come," she said, thanking the Ministry of IT, PSEB, PTA, Foreign Affairs, and especially P@SHA Chairman Sajjad Syed for their role in making the forum a success.

In addition to export growth, the minister noted significant progress in digital access and inclusion. Pakistan now has over 200 million mobile subscribers, with internet usage growing by over 25% in 2024. The Gender Digital Divide Policy also helped reduce the gender gap in mobile internet use from 38% to 25%. As a result, 8 million women accessed mobile internet for the first time last year.

“Women and youth are the backbone of our digital future,” she said, stressing that inclusive access to technology will drive innovation and socio-economic development.

The minister also highlighted major connectivity achievements through programs like Ignite and the Universal Service Fund (USF), which connected over one million people in 900+ remote areas. Additionally, two new submarine cable projects are underway to further boost Pakistan's international digital connectivity.

"These developments are paving the way for a truly digital Pakistan — where every citizen has a digital ID and access to government services via mobile apps, eliminating the need for physical queues," she stated ■



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## Agriculture in Pakistan

Pakistan's agriculture sector contributes around 23 percent to the GDP and employs 37.4 percent of the national

labour force.

About 70 percent of Pakistan's exports are directly or indirectly derived from agriculture. Covering an area of 30.5 million hectares, about 47 percent of the national land is agricultural land, higher than the

global average of 38 percent.

In the agriculture sector, livestock has an overwhelming contribution of 62 percent, followed by important crops (4.1 percent), other crops (3.3 percent), forestry (0.5 percent) and fisheries (0.3 percent). ■

# Pakistan Invites Azerbaijan to Invest in Carbon Trading and Green Energy Projects

In a high-level meeting held in Islamabad, Senator Musadik Masood Malik, Federal Minister for Climate Change & Environmental Coordination, extended a strategic investment proposal to the Ambassador of Azerbaijan to Pakistan, Khazar Farhadov, highlighting Pakistan's untapped market potential in carbon offsetting and trading, particularly through forestry and mangrove restoration projects.

Minister Malik pro-



posed that Azerbaijan consider investing in these nature-based climate solutions, which could generate high-value carbon credits for sale on the international market—yielding returns that may significantly exceed initial investments. The offer forms part of Pakistan's broader efforts to

attract foreign collaboration in its emerging green economy.

During the meeting, both sides held in-depth discussions on shared interests in environmental conservation, climate resilience, and sustainable investment. Minister Malik emphasized Pakistan's commitment to building a robust carbon

market and expanding its footprint in renewable energy and green industries.

"Pakistan is positioning itself as a hub for green industry," said Malik. "We welcome international partnerships to develop projects that are not only profitable but also deliver environmental impact. This creates a unique opportunity for Azerbaijani investors

to take part in a win-win venture."

He further encouraged Azerbaijani investment in solar energy projects, noting their commercial viability and alignment with Pakistan's sustainability goals. He invited Azerbaijan to explore joint ventures, especially those supporting ESG (Environmental, Social, and Governance) compliance, carbon reduction, and green innovation.

Ambassador Farhadov expressed keen interest in the investment prospects and acknowledged Azerbaijan's strong desire to deepen bilateral cooperation, particularly through economic and environmental collaboration.

He also emphasized the importance of people-to-people ties and highlighted the role of the business community

as a vital pillar in Azerbaijan's diplomatic engagement with Pakistan. Ambassador Farhadov noted the significant rise in tourism between the two nations, revealing that approximately 250,000 Pakistani citizens visited Azerbaijan in 2023, making it one of the most popular travel destinations for Pakistanis.

Both leaders reaffirmed their commitment to strengthening bilateral relations, with a focus on climate-smart investments, sustainable development, and economic cooperation. They agreed that enhanced collaboration in environmental and green sectors would not only bolster diplomatic ties but also accelerate progress toward shared development goals. — ER Report



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## Pakistan Eyes \$125 Billion Agri Exports by 2030

Federal Minister for National Food Security and Research, Rana Tanveer Hussain, announced that Prime Minister Shehbaz Sharif envisions a "Second Green Revolution" aimed at transforming Pakistan's agriculture sector and boosting agri-exports to \$125 billion by 2030.

Chairing a high-level consultative meeting at the Pakistan Agricultural Storage and Services Corporation (PASSCO) headquarters, the Minister emphasized that the federal government is prioritizing comprehensive reforms to modernize agriculture, livestock, and fisheries through 28 strategic initiatives.

"These initiatives will enhance value chains, strengthen export capacity, and generate substantial foreign exchange," said Hussain. "In line with the Prime Minister's vision, six specialized working groups have been formed to accelerate agricultural growth through innovation, farmer empowerment, and regulatory reform."

The working groups will focus on:

- Integrating technology and IT in agriculture
- Enhancing research and farmer training
- Promoting mechanization
- Expanding financial inclusion
- Developing legal and regulatory

frameworks

Driving comprehensive sectoral growth

Punjab Leading the Way in Agricultural Reforms

Praising Punjab's agricultural progress, Rana Tanveer lauded the efforts led by Chief Minister Maryam Nawaz Sharif, calling the province a model of farmer-friendly reforms. He stressed that digitally empowering farmers to access services at their doorstep is a core objective of the national strategy.

Punjab Agriculture Minister Ashiq Hussain Kirmani presented updates on the province's Rs400 billion agriculture transformation plan, highlighting the use of advanced seed technologies and modern farm machinery to improve crop yields.

"This year, four Agri Malls are being set up, with plans to expand to ten in the next fiscal year," said Kirmani. "Farmers are being given access to state-of-the-art machinery on rent at the tehsil level."

He also noted key initiatives for financial empowerment, including:

Punjab Kisan Card: Over Rs55 billion disbursed in interest-free loans

Subsidised Green Tractors: 9,500 farmers benefitted, each receiving a Rs1 million subsidy — a first in the country's history

To enhance outreach and advisory services, 1,000 agriculture graduates have been hired to provide technical assistance. The

government also plans to roll out mobile extension offices and labs at the union council level, offering free soil and water testing and expert guidance.

As part of the Punjab Clean Air Programme, 5,000 super seeders are being distributed to manage rice stubble without burning, promoting sustainable practices.

Policy Support and Sectoral Challenges

Punjab Chief Secretary Zahid Akhtar Zaman affirmed that progress in agriculture and livestock is driven by a farmer-centric approach, with a particular emphasis on introducing improved cotton seed varieties.

However, Punjab Agriculture Secretary Iftikhar Ali Sahoo highlighted a major hurdle: high import duties on agricultural machinery. "There's currently a 25% duty on locally produced equipment and 35% on imported machinery, which must be reduced to support the mechanization drive," he urged.

Looking Ahead

With a comprehensive reform strategy, inter-provincial coordination, and a clear export-oriented vision, Pakistan is preparing to transform its agriculture landscape. The collaborative efforts between the federal and Punjab governments reflect a united push toward sustainable, high-yield, and technologically advanced farming practices — setting the stage for a new era of agricultural prosperity. — ERMD

# Pakistan's cyber landscape requires a balanced approach

By Prof. Dr. Tariq Rahim Soomro, Rector, IoBM, Karachi

Cybersecurity refers to the practice of protecting systems, networks, and data from digital attacks, unauthorized access, and damage through preventive measures like encryption, firewalls, and policy frameworks. While the term Cybercrime encompasses illegal activities conducted via digital means, such as hacking, fraud, identity theft, and the dissemination of malicious content.



The population of Pakistan as of April 2025 is 254.28 million, with real-time estimates indicating a daily growth rate of approximately 1.58% (<https://populationtoday.com/pk-pakistan/>).

Projections for mid-2025 suggest the population will reach 255.2 million, reflecting Pakistan's

position as the 5th most populous country globally (<https://worldpopulationreview.com/countries/pakistan>). Below is a detailed breakdown of key demographic metrics and trends:

Let's explore the demographic trends of Pakistani population. The median age 20.6 years,

indicating a youthful population (<https://www.worldometers.info/demographics/pakistan-demographics/>). If we categorize the population, it is interesting that 35.3% under

15 years, 60.2% aged 15–64, and 4.5% over 65 (2025 UN projections - [https://en.wikipedia.org/wiki/Demographics\\_of\\_Pakistan](https://en.wikipedia.org/wiki/Demographics_of_Pakistan)).

As of early 2025, Pakistan's Internet penetration rate stands at 45.7%, with 116 million internet users out of a population of 253 million. This reflects a steady growth trajectory, though

challenges, such as, infrastructure limitations, digital divide (urban-rural divides) and cybercrime victims. Mobile broadband dominates, accounting for 142 million subscriptions (compared to 3

million fixed broadband connections - [https://en.wikipedia.org/wiki/Internet\\_in\\_Pakistan](https://en.wikipedia.org/wiki/Internet_in_Pakistan)).

The median mobile internet download speed improved to 20.89 Mbps (+25.3% year-on-year), while

fixed broadband speeds reached 15.53 Mbps (<https://datareportal.com/reports/digital-2025-pakistan>).

Pakistanis are found of the following social media platforms:

Pakistan's social media adoption trends:

As far as market share is

concerned, Facebook dominates with 95.95% of social media traffic,

followed by TikTok (1.79%) and YouTube (0.86%) (<https://gs.statcounter.com/social-medias-tats/all/pakistan>). Social media users skew heavily male (70.4% male vs. 29.6% female -

<https://datareportal.com/reports/digital-2025-pakistan>).

Keeping in view the Pakistani population penetration on the Internet, the traditional criminal

moves their heads towards cybercrime. Cybercrime is an emerging threat driven by rapid Internet

penetration and limited regulatory frameworks. Key forms include hacking, financial fraud,

cyberbullying, and identity theft.

Cyber-dependent crimes (e.g., hacking, malware) score 5/10 in Pakistan's criminal markets,

indicating moderate but growing activity (<https://ocindex.net/country/pakistan>). A 2023 study

found that 42.85% of Pakistani university students experienced cyberbullying, with urban areas

and higher socioeconomic groups more vulnerable (<https://www.sciencedirect.com/science/article/abs/pii/S0160791X2100052X>).

Financial crimes,

such as phishing and credit card fraud, are rising due to weak cybersecurity measures and unlicensed software use ([https://www.academia.edu/39793853/Pakistan's\\_Internet\\_Landscape\\_2018](https://www.academia.edu/39793853/Pakistan's_Internet_Landscape_2018)).

Here we are discussing the prominent cybercrimes happening in Pakistan along with its possible

solution to prevent them.

1. Cyber Terrorism and Recruitment: Cyberterrorism involves hacking critical infrastructure

(e.g., government websites) or using social media to recruit for extremist groups. For example,

Section 10 of PECA 2016 criminalizes cyberterrorism, with penalties up to 14 years imprisonment

(<https://www.globalvillagespace.com/cyber-crimes-and-cyber-security-in-pakistan/>). The

possible challenges are lack of advanced forensic tools and cross-border coordination

(<https://www.linkedin.com/pulse/pakistan-cybercrime-wing-ccw-fia-combating-digital-threat-tahir-kvjof>). The

right solution had been made and the new agency was

formed names as National Cyber Crime Investigation Agency (NCCIA) with specialized training and funding

(<https://rsilpak.org/2025/2025-amendments-to-the-prevention-of-electronic-crimes-act-2016-an-introduction/>) (<https://tocspectrum.com/happenings/pakistan-cybercrime-bill-2025/>). Fortunately

the new DG was appointed on April 4, 2025. These steps will enhance interna-

tional cooperation

through treaties like the Budapest Convention (<https://www.coe.int/en/web/octopus/-/pakistan>)

(<https://www.icrc.org/en/document/pakistan-round-table-ihl-cyber-security>) and implement realtime monitoring of extremist content on social media

(<https://ipi.media/pakistan-amendedcybercrime-law-poses-new-threats-to-press-freedom/>).



2. Online Harassment and Child Exploitation: Includes cyberstalking, non-consensual sharing

of explicit content, and child pornography. Over 150 journalists were charged under PECA in 2024

for "defamation," often linked to critical reporting (<https://ipi.media/pakistan-amendedcybercrime-law-poses-new-threats-to-press-freedom/>). The possible challenges are

underreporting due to social stigma and weak enforcement. The possible

solutions are establishing dedicated Cybercrime Reporting Centers with 24/7 helplines (e.g., FIA's CCW 1991 helpline -

<https://www.linkedin.com/pulse/pakistan-cybercrime-wing-ccw-fia-combating-digital-threat-tahir-kvjof>),

launch public awareness campaigns on digital literacy and safe online practices

(<https://www.icrc.org/en/>)

document/pakistan-round-table-ihl-cyber-security) and enforce stricter

penalties under PECA Section 21 (protection of women) and Section 22 (child abuse)

(<https://www.globalvillagespace.com/cyber-crimes-and-cyber-security-in-pakistan/>).



3. Financial Fraud and Phishing: Scams like Business Email Compromise (BEC) and SIM card

fraud. In 2025, a Pakistan-based group, Heart-Sender, caused \$3 million in losses through phishing

kits. The possible challenges are lack of secure payment gateways and public awareness. yyyThe

(<https://www.globalvillagespace.com/cyber-crimes-and-cyber-security-in-pakistan/>), collaborate

with international agencies (e.g., Interpol) to dismantle cross-border networks

(<https://therecord.media/pakistan-cybercrime-busted-dutch-doj>) and train financial institutions to

recognize and report suspicious activity (<https://www.linkedin.com/pulse/pakistan-cybercrimewing-ccw-fia-combating-digital-threat-tahir-kvjof>).

4. Misinformation and

Contd on page 11

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# Defining Sustainability Protocols in Technology Development

Engr. Dr. Muhammad Nawaz Iqbal

**T**echnological development, when considered with environmental, social, and economic considerations at all stages of innovation, is referred to as technical development in technology.

With digital transformation underway, those of us building technologies are now concerned about whether they harm tomorrow's resources. This calls for a development model shift from the traditional models to those that reflect long-term viability, ethical models, and a low environmental footprint. When understanding the relationship between how their technological products or services affect the environment, developers must first start with an in-depth understanding of that. At each stage of the technology life cycle, there is potential to have environmental consequences from the sourcing of raw materials through the energy used during use, and then disposal. An effective method to trace and quantify these impacts is an industry practice known as Life Cycle Assessment (LCA), which can be employed to enable teams to make informed decisions resulting in a significant reduction of nega-

tive externalities. By embedding sustainability into design thinking, developers can develop innovation mixed with responsibility at the same time.

The process is to select recyclable or biodegradable materials to work with, design for energy efficiency, and use modular systems that can be repaired and upgraded as opposed to having to be replaced. Developers can increase the usability of their products as well as reduce waste if they design with the end-of-life scenarios as part of the design phase. This is especially true for sustainable protocols of energy consumption factors such as data centers, cloud computing, and mobile applications. One of those is optimizing systems to consume less electricity by using efficient coding, hardware optimization and usage of renewable energy sources. It would be a good thing for people developing systems to be measured and report its carbon footprint, and always for new ways to reduce this carbon footprint. Sustainable technology development also depends on material sourcing. There are rare earth elements that often used in electronics, can be found in conflict zones, or are extracted in environmentally damaging ways.

Protocols were to include sourcing standards thereof

which should favor the sponsorship of certified, ethically mined materials, thereby promoting supply chains that support human rights while reducing ecological degradation. Such principles of the circular economy help minimize the linear "take-make-dispose" under which much of today's technology development takes place. Products should be designed to facilitate disassembly, reuse, and recyclability at the end of their life. This would drastically reduce the environmental burden that electronic waste creates by making manufacturers responsible for the proper management of their products at the end of their lives. Software itself has ecological implications, especially in terms of scale; inefficient software can drain batteries, necessitating bigger, and thereby more powerful, servers that generally increase operational costs. Among green software engineering principles that developers should adopt would be efficient algorithms, reduced processing needs bulging and low memory consumption. Though these changes may seem to be much less important by themselves, they could end up contributing massively to the benefits gained in the environment.

Infrastructure decisions have implications for sustainability as well. Servers, networks, and other back-end

systems consume large amounts of energy. The design of IT architecture with energy-efficient equipment, virtualization technologies, and the use of clean energy sources can significantly lower the environmental footprint. Long-term strategy must incorporate regular maintenance and replacement of these systems with more efficient ones. Beyond the environment, sustainability also means social responsibility. Technology solutions should be designed with inclusiveness in mind, catering to many users' needs and avoiding designs that would exclude or marginalize other users. This includes accessibility features, multilingual capabilities, and user training in the adoption of socially sustainable technology. As part of global sustainability initiatives, developers and organizations must adhere to recognized frameworks and regulations. Standards such as ISO 14001 and the Sustainable Development Goals (SDGs) provide guidelines for ethical and sustainable practices. These frameworks will provide both accountability and a compass for routine operations to integrate sustainability.

Such advancement in technology should be aimed at solving urgent societal and environmental problems. From applications that support disaster response to

those enabling remote education or clean energy management, proper synchronization of innovative technology to meaningful objectives ensures that the resultant technological progress contributes even more to the aggregate welfare. Of course, impact assessment and sustainability reporting are important for transparency and tracking measures. Organizations should publish detailed reports on their environmental footprints, resource usage, and community impact. These reports encourage accountability and build stakeholder trust and benchmarking against competition. Through team education and awareness at development, tech development teams need to build them up for the future. The developer, project managers, and even visitors need training on the sustainability dimensions of their actions, the unsustainability consequences, and the opportunities available when adopting the sustainability mindset. This awareness can be institutionalized using internal policies and workshops.

Sustainability protocols should be understood as living, organic rules and never as absolute. They should respond to new discoveries, the changing nature of regulation, and advances in technology. Mechanisms of feedback, innovations in green



practice, and periodic review of sustainability objectives will guarantee that these protocols remain relevant and effective. To integrate and sustain sustainability in the technology development process, organizations must embed sustainability as a core value, project planning, and operational process. They should have clear definition of measurable sustainability goals, involve stakeholders in the process of developing these goals, and hold teams accountable for both environmental and social footprints. Cross-functional collaboration, continuous improvement, and deliberate investment in green technologies are all mandatory. Ultimately, sustainability becomes neither destination nor end; it describes how every decision is cast and how every innovation is viewed. ■

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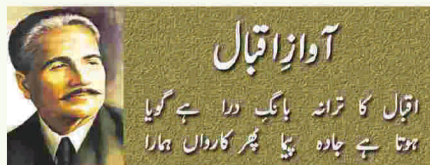
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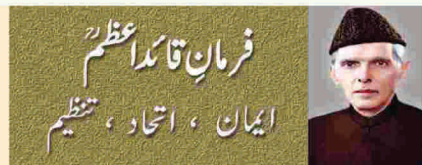


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صرف اس وجہ سے ہے کہ انگریز اس سارے ملک پر حکمران ہیں۔  
(مسلم لیگ کانفرنس، بمبئی، 26 مئی 1940ء)



#### اصول اور تفصیلات

گاندھی جی کہتے ہیں: "ہندوستان کو جیتنے کی کلے کلے کیا جا رہا ہے"  
راج گپال جی کہتے ہیں: "بچے کے کلے کلے کیے جا رہے ہیں"  
قدرت نے پہلے ہی سے ہندوستان کو تقسیم کر رکھا ہے اور اس کے

## Pakistan's cyber landscape requires a balanced approach

### Contd from page 9

Fake News: Intentional spread of false information under Section 26-A of PECA 2025, punishable by 3 years imprisonment (<https://tecspectrum.com/happenings/pakistan-cybercrime-bill-2025/>). The possible challenges are vague definitions like "public fear" enable misuse against journalists (<https://ipi.media/pakistan-amended-cyber-crime-law-poses-new-threats-to-press-freedom/>) (<https://www.paradigmshift.com.pk/peca-amendment/>). The possible solutions are promote factchecking initiatives and media literacy programs (<https://www.icrc.org/en/document/pakistan-roundtable-ihl-cyber-security>) and ensure judicial oversight for content removal by the Social Media Protection Tribunal.

5. Identity Theft and Data Breaches: Unauthorized access to personal data for fraud. For example, hackers selling call records and email accounts



(<https://www.linkedin.com/pulse/pakistan-cybercrime-wing-ccw-fia-combating-digital-threat-stahir-kvjof>). The possible challenges are weak data protection laws and poor compliance by private entities. The possible solutions are enact a Data Protection Act with penalties for breaches, encourage companies to adopt ISO 27001 cybersecurity standards (<https://www.cissmp.com/index.php/CISSMP>)

/article/view/94) and establish Computer Emergency Response Teams (CERTs) for rapid incident response (<https://www.icrc.org/en/document/pakistan-roundtable-ihl-cyber-security>) and officially Government of Pakistan announced the formation of countries 1st National Computer Emergency Response Team (CERT) on March 11, 2024 ([https://en.wikipedia.org/wiki/Pakistan\\_Computer\\_Emergency\\_Response\\_Team#:~:text=4%20R](https://en.wikipedia.org/wiki/Pakistan_Computer_Emergency_Response_Team#:~:text=4%20R)ferences-History,Emergency%20Response%20Team%20(CERT).).

#### 6. Hacking and Malware Attacks:

Attacks on government and private systems, such as Distributed Denial of Service (DDoS) and ransomware are being in common in Pakistan and

Pakistan ranks 14th in Asia-Pacific for cyber vulnerabilities (<https://www.icrc.org/en/document/pakistan-roundtable-ihl-cyber-security>). The possible challenges are outdated infrastructure and insufficient investment in cybersecurity. The possible solutions are upgrade national cybersecurity infrastructure with AI-driven threat detection (<https://www.cissmp.com/index.php/CISSMP/article/view/94>), conduct regular pene-

tration testing for critical systems (<https://www.linkedin.com/pulse/pakistan-cybercrime-wing-ccw-fia-combating-digital-threats-tahir-kvjof>) and foster public-private partnerships to share threat intelligence. In conclusion, Pakistan's cyber



landscape requires a balanced approach: robust legal frameworks (e.g., PECA 2025 amendments - <https://rsilpak.org/2025/2025-amendments-to-the-prevention-of-electronic-crimes-act-2016-an-introduction/>), institutional capacity-building (e.g., NCCIA - <https://tecspectrum.com/happenings/pakistan-cybercrime-bill-2025/>), and public education.

However, safeguards against misuse, such as judicial oversight and clear definitions, are critical to protecting civil liberties (<https://www.paradigmshift.com.pk/peca-amendment/>). Also note that digital deception, for example, Deep-Fake and Digital Arrest are around the corners and law enforcement agencies have to watch them carefully. - (The author is Chair IEEE Karachi Section, Cybersecurity Expert - tariqsoomro@gmail.com, rector@iobm.edu.pk)■

BISMILLAH HIR REHMAN NIR RAHEEM

## PROPHET YOUSUF

By Muhammad Tariq Haq | ESL

In ancient lands where tales unfold,  
— A story to Muhammad (PBUH), was divinely told.

Sent by Allah, a guiding light,  
— Through tests and trials, Yusuf was always tried.

In Quran, his tale shines bright,  
— Meccans inquired "How Bani Israel to Egypt arrived?"

They doubted Muhammad's claim,  
— Yet eternal truth, brought them to shame.

Young Yusuf dreamed of stars and sun,  
— Jacob cautioned: "mention to none."

His brothers envied, their hearts were led astray,  
— They cast him in a well and walked away.

A caravan passed through the desert sands,  
— Lifted him to foreign lands.

In Egypt's mansions, as a slave he stayed,  
— In Aziz's house, his true qualities were displayed.

But in Zulaikha's heart, was a fire alight,  
— She desired pleasure and delight.

She tempted, but he ran outside,  
— Preserving his honour, with dignity and pride

When her friends criticised,  
— They cut their hand with the knife; utterly mesmerised

Imprisoned, though it was not justified  
— while he interpreted dreams, his wisdom was recognised.

Two prisoners sought his insight,  
— One would serve wine, the other would be crucified

In prison's dark, Joseph spent his days and nights,  
— Till king saw a dream, continued his plight.

About seven cows fat and thin, he prophesied  
— Seven years of prosperity and then famine will strike

With wisdom rare, Yusuf advised:  
— "Store the ears of grain; be prepared and wise."

From prisoner to ruler, he made his rise,  
— Thus, Allah rewards the true and upright.

His brothers came, in need of grain,  
— Unaware, their brother Yousuf held power and might.

Through subtle tests, their hearts he tried,  
— To see if any virtue therein did reside.

His brothers bowed, as childhood dreams saw the daylight,  
— Yusuf responded with mercy and generously supplied.

He turned to them with grace profound,  
— "Today, no blame is on you, but only respite."

The Quran's message is loud and clear,  
— Invite mankind to reflect and by it teachings abide.

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## پاکستان "تھوریم" ذخائر سے ہزار ہا میگا واٹ بجلی بنا سکتا ہے

سندھ و بلوچستان کے صحرائی علاقوں  
میں 10 ہزار ٹن یہ دھات محفوظ ہے،  
سائنسی رپورٹ

ایک سائنسی رپورٹ کے مطابق سندھ و بلوچستان کے صحرائی علاقوں کی چٹانوں میں تھوریم (Thorium) دھات کے 10 ہزار ٹن تک ذخائر موجود ہیں۔ دھات مولیبنڈیم سالت نامی ری ایکٹر میں کیپسولیٹ میں سے یورینیم 233 بن کر بجلی بناتی ہے، صرف 1 ٹن تھوریم سے 200 ٹن یورینیم اور 35 لاکھ ٹن کوئلے جتنی نسبتاً صاف بجلی بنا سکتا ہے، چین سالت گولڈ میں دنیا کا پہلا مولیبنڈیم سالت ری ایکٹر تعمیر کر رہا ہے، پاکستان بھی جتنی تعاون سے یہ جدید ترین ری ایکٹر لگا سکتا ہے، ماہرین کہتے ہیں کہ چین میں 10 تا 15 لاکھ ٹن تھوریم کے ذخائر محفوظ ہو چکی ہیں۔ چینی ضروریات 50 ہزار سال تک پوری کر سکتے۔ پاکستان چین سے بھی تھوریم منگوا کر سستی بجلی بنا سکتا۔ ■

## پاکستان اور روس کا کراچی میں نئی اسٹیل مل قائم کرنے پر اتفاق

وزیر اعظم کے معاون خصوصی ہارون اختر خان اور روسی نمائندے ڈینس نظروف کے درمیان ایک اہم ملاقات ہوئی۔ ہارون اختر خان اور ڈینس نظروف نے اس ملاقات میں کراچی میں نئی اسٹیل مل کا قیام کے بارے میں تبادلہ خیال کیا۔



دونوں فریقین نے منصوبے کی تکمیل کیلئے پاکستان اور روس کا ایک مشترکہ ورکنگ گروپ بنانے پر اتفاق کیا۔ ہارون اختر خان نے کہا کہ غیر ملکی سرمایہ کاروں کے لیے پاکستان میں سرمایہ کاری کرنے کیلئے یہ بہترین وقت ہے کیونکہ اب سرمایہ کاری کیلئے پاکستان ایک مضبوط اور محفوظ مقام بن چکا ہے اور یہ

## دھانیجی اسپیشل اکنامک زون اہم، عالمی سرمایہ کاری آئیگی، مرادشاہ

1 لاکھ سے زیادہ روزگار کے مواقع پیدا ہونگے، اعلیٰ سطح کے اجلاس میں گفتگو

کمل ہو چکا ہے جبکہ بجلی، 10 ایم پی ڈی واٹر پائپ لائن کی تنصیب اور گیس کے بنیادی ڈھانچے پر کام تقریباً مکمل ہو چکا ہے۔ امریکا اور چین کے درمیان جاری تیرف کشیدگی کے بعد کئی چینی صنعتکار اپنی صنعتوں کو کم لاگت والے علاقوں میں منتقل یا وسعت دینے کے خواہاں ہیں۔ دھانیجی اسپیشل اکنامک زون جو کہ کسی پیک کا ترجمانی منصوبہ ہے، 2 سے 3 ارب ڈالر کی سرمایہ کاری کو راغب کرے گا اور 1 لاکھ براہ راست و بالواسطہ روزگار کے مواقع پیدا کرے گا۔

وزیر اعلیٰ مراد علی شاہ نے دھانیجی اسپیشل اکنامک زون کی اسٹریٹجک اہمیت پر زور دیتے ہوئے کہا کہ یہ منصوبہ سندھ کو بین الاقوامی اجلاس کو بتایا گیا کہ دھانیجی اسپیشل اکنامک زون میں تعمیراتی کام تقریباً 12 فیصد



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## 3-D printed smart fabrics maintain flexibility and sensing ability after repeated washes

**I**magine a T-shirt that could monitor your heart rate or blood pressure.

Or a pair of socks that could provide feedback on your running stride. It may be closer than you think, with new research from Washington State University demonstrating a particular 3D ink printing method for so-called smart fabrics that continue to perform well after repeated washings and abrasion

washing.

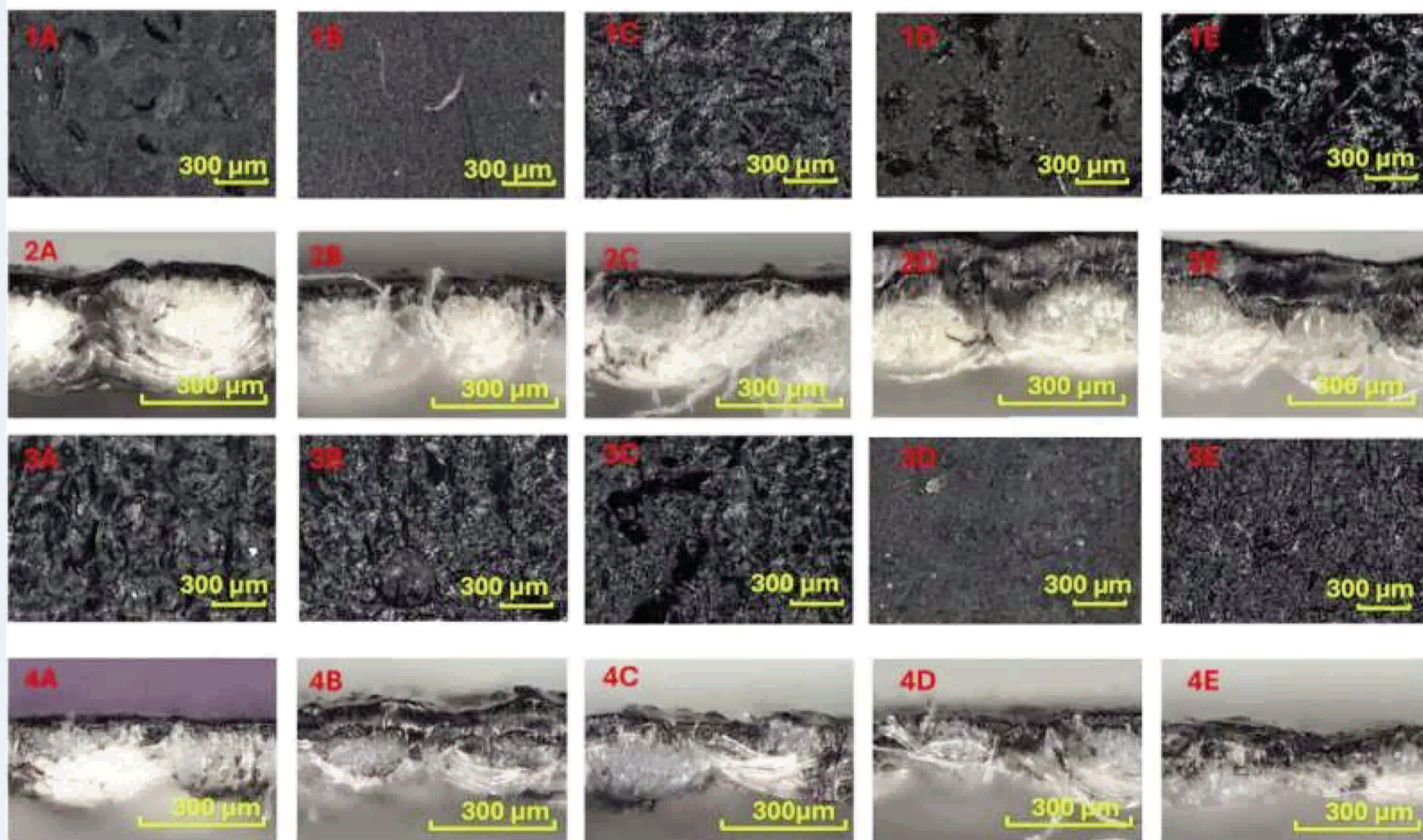
"The materials used, or the technology used, generally produce very rigid or stiff fabrics," said Liu, an associate professor in the Department of Apparel, Merchandising, Design and Textiles. "If you are wearing a T-shirt with 3D printed material, for example, for sensing purposes, you want this shirt to fit snugly on your body, and be flexible and soft. If it is stiff, it will not be comfortable and the sensing performance will be compromised."

containing carbon nanotubes onto two types of fabric. The printed fabrics showed excellent electrical conductivity, mechanical strength, gauge factor and stability under repeated strains, and the solution's ability to penetrate and bond with fibers gave the fabrics an enhanced washability and resistance to abrasion.

They tested printed fabrics for tensile strength, electrical conductivity, their ability to function as motion sensors, and other qual-

can perform some of the same tasks as smart watches and other such devices. The technology has the potential for applications in health care, for first responders, in the military and for athletes.

The study was a part of the doctoral dissertation of one of Liu's students, Zihui Zhao, who was the lead author. Liu has been working on various elements of smart fabrics for several years; she developed a fiber with the flexibility of cotton and the electrical conduc-



tests. The research, published in the journal ACS Omega, represents a breakthrough in smart fabric comfort and durability, as well as using a process that is more environmentally friendly.

Hang Liu, a textile researcher at WSU and the corresponding author of the paper, said that the bulk of research in the field so far has focused on building technological functions into fabrics, without attention to the way fabrics might feel, fit, and endure through regular use and maintenance, such as

Initial methods of developing smart wearables involved gluing, weaving or sewing functional components such as conductive threads or sensors into fabrics. Newer approaches involving printing have shown promise, but have still faced problems with comfort and maintenance.

Liu's team used direct ink writing 3D printing technology to print solutions of polybutylene succinate—a biodegradable polyester that is compatible with natural fibers—

ities. They found the fabrics continued to perform well after 20 cycles of washing and drying, and the surfaces did not scratch or crack after 200 cycles of abrasion testing or 500 cycles of tensile cyclic testing.

The team also used a biodegradable, non-toxic solvent, Cyrene, for processing, which is more environmentally friendly than commonly used toxic solvents.

Smart fabrics are an emerging trend, offering the promise of clothing items that

tivity of a polymer that could have use in wearable tech, as detailed in a paper published in 2023.

The most recent work on 3D printing focused on the ability of fabrics to sense and monitor information; developing functional smart wearables will also require power source and data transmission technologies.

"This is only one part of the whole smart system," Liu said. - TP

# Interlocked electrodes push silicon battery lifespan beyond limits

As demand surges for batteries that store more energy and last longer powering electric vehicles, drones, and energy storage systems—a team of South Korean researchers has introduced an approach to overcome a major limitation of conventional lithium-ion batteries (LIBs): unstable interfaces between electrodes and electrolytes.

Most of today's consumer electronics such as smartphones and laptops rely on graphite-based batteries. While graphite offers long-term stability, it falls short in energy capacity.

Silicon, by contrast, can store nearly 10 times more lithium ions, making it a promising next-generation anode material. However, silicon's main drawback is its

dramatic volume expansion and contraction during charge and discharge, swelling up to three times its original size.

This repeated expansion

replacing liquid electrolytes with solid or quasi-solid-state electrolytes (QSSEs), which offer better safety and stability. Yet, QSSEs still

POSTECH (Pohang University of Science and Technology) and Sogang University has developed an in-situ Interlocking Electrode-Elec-

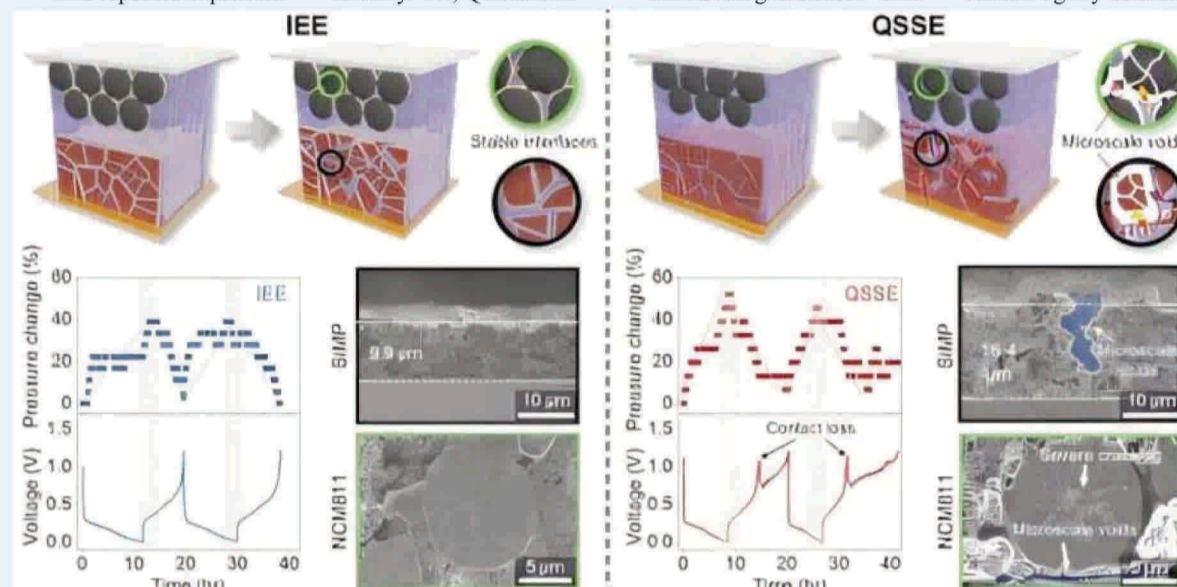
tem bonds the two into a chemically entangled structure, like bricks held together by hardened mortar, so they remain tightly connected

cycles, those using the IEE design maintained long-term stability.

Most notably, the IEE-based pouch cell demonstrated an energy density of 403.7 Wh/kg and 1,300 Wh/L, representing over 60% greater gravimetric energy density and nearly twice the volumetric energy density compared to typical commercial LIBs. In practical terms, this means electric vehicles can travel farther and smartphones can operate longer using the same-sized battery.

"This study offers a new direction for next-generation energy storage systems that simultaneously demand high energy density and long-term durability," said Professor Soojin Park of POSTECH, who co-led the study.

Professor Jaegwon Ryu of Sogang University added, "The IEE strategy is a key technology that could accelerate the commercialization of silicon-based batteries by significantly enhancing interfacial stability." - TP



and contraction causes mechanical gaps between the electrode and the electrolyte, quickly degrading battery performance.

To address this, researchers have explored

struggle to maintain full contact with the expanding and contracting silicon, leading to separation and performance loss over time.

Now, a collaborative research team from

trolyte (IEE) system that forms covalent chemical bonds between the electrode and electrolyte.

Unlike conventional batteries where components merely touch, the IEE sys-

tem even under intense mechanical stress.

Electrochemical performance tests showed a dramatic difference: while traditional batteries lost capacity after just a few charge-discharge

## Can generative AI replace humans in qualitative research studies?

Having humans participate in a study can be time-consuming and expensive for researchers stretching limited budgets on strict deadlines.

Sophisticated, generative large language models (LLM) can complete many tasks, so some researchers and companies have explored the idea of using them in studies instead of human participants.

Researchers from Carnegie Mellon University's School of Computer Science identified fundamental limitations to using LLMs in qualitative research focused on a human's perspective, including the ways information is gathered and aggregated and issues surrounding consent and data collection.

"We looked into this question of if LLM-based agents can replace human participation in qualitative research, and the high-level answer was no," said Hoda Heidari, the K&L Gates Career Development Assistant Professor in Ethics and Computational Technologies in CMU's Software and Societal Systems Department (S3D) and Machine Learning Department.

"There are all sorts of nuances that human participants contribute that you cannot possibly get out of LLM-based agents, no matter how good the technology is."

The team's paper, "Simulacrum of Stories: Examining

Large Language Models as Qualitative Research Participants," received an honorable mention award at the Association for Computing Machinery's Conference on Human Factors in Computing Systems (CHI 2025) last week in

Postdoctoral Fellow in the HCII; Motahare Eslami, an assistant professor in the HCII and S3D; and Sarah Fox, an assistant professor in the HCII.

The paper is available in the Proceedings of the 2025 CHI Conference on Human

late and practice real-life scenarios, such as a therapist training to identify mental health crises. In qualitative research, which is often interview-based, LLMs are being trained to mimic human behavior in their responses to

and forth. The tool allowed researchers to compare LLM-generated data with human-generated data and reflect on ethical concerns.

Researchers identified several ways using LLMs as study participants intro-

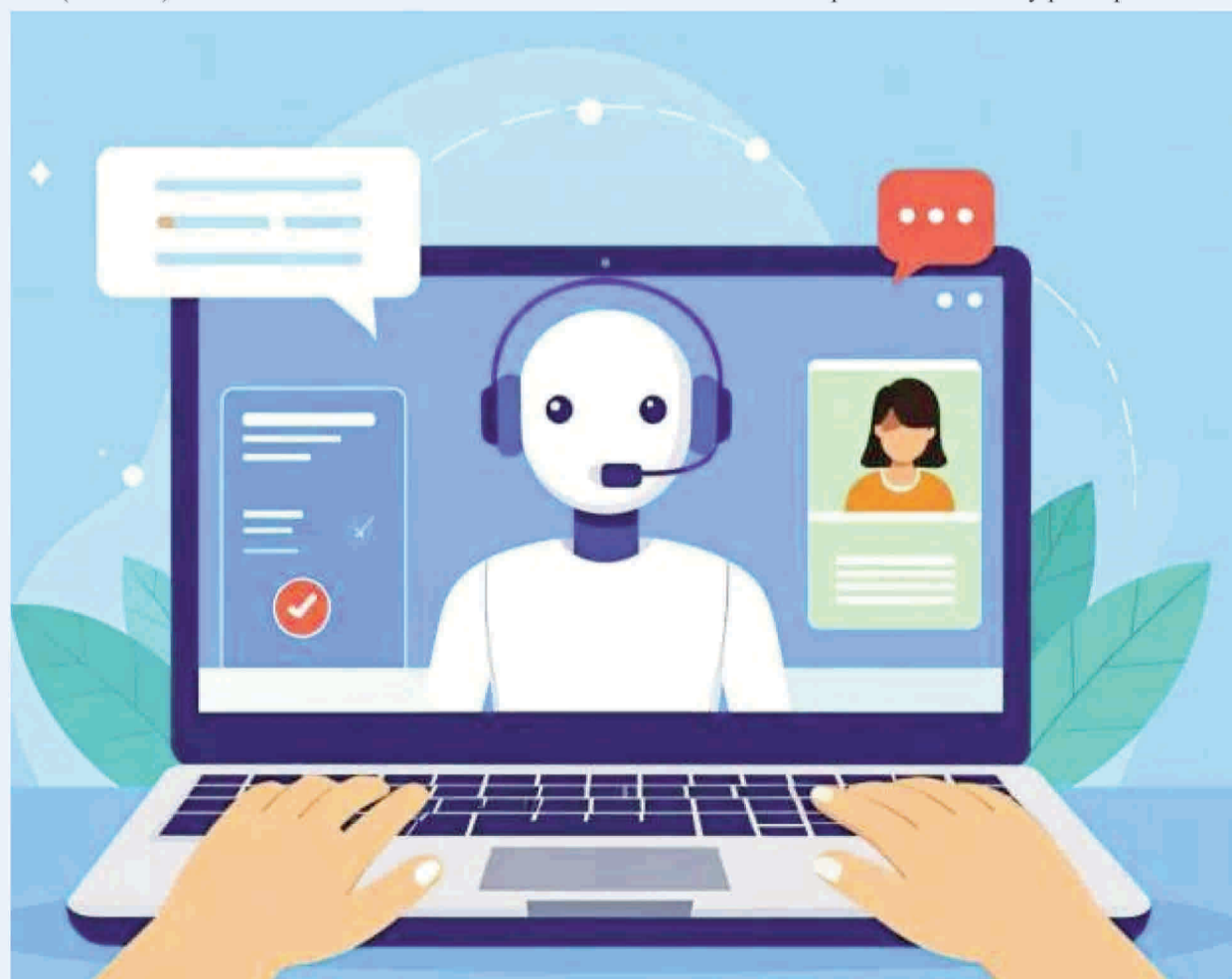
from multiple sources and fit them—sometimes unnaturally—into one response.

For example, in a study about factory working conditions, a worker on the floor and a manager would likely have different responses about a variety of aspects of the work and workplace. Yet an LLM participant generating responses might combine these two perspectives into one answer—conflating attitudes in ways not reflective of reality.

Another way the LLM responder introduced problems into the scientific inquiry process was in the form of consent. In the paper, the researchers note that LLMs trained on publicly available data from a social media platform could raise questions about informed consent and if the people whose data the models are trained on have the option to opt out.

Overall, the study raises doubts about using LLMs as study participants, noting ethical concerns and questions about the validity of these tools.

"These models are encoded with the biases, assumptions and power dynamics of model producers and the data and contexts from which they are derived," the researchers wrote. "As such, their use in research reshapes the nature of the knowledge produced, often in ways that reinforce existing hierarchies and exclusions." - TP



Yokohama, Japan.

Team members from SCS included Heidari; Shivani Kapania, a doctoral student in the Human-Computer Interaction Institute (HCII); William Agnew, the Carnegie Bosch

Factors in Computing Systems.

LLMs are used as tools in training across a variety of fields. In the medical and legal professions, these tools allow professionals to simu-

questions and prompts.

In the study, the CMU team interviewed 19 humans with experience in qualitative research. Participants interacted with an LLM chatbot-style tool, typing messages back

duced limitations to scientific inquiry, including the model's method of gathering and interpreting knowledge. Study participants noted that the LLM tool often compiled its answers