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Islamabad, Sindh Agree on Revival of KCR, Suburban Rail and New Train Services

CM Sindh Murad Ali Shah and Federal Minister for Railways Hanif Abbasi believe developing green corridors along railway tracks will improve mobility and environmental conditions in the city.

By **Manzoor Shaikh**

Sindh Chief Minister Syed Murad Ali Shah and Federal Minister for Railways Hanif Abbasi have agreed on a comprehensive plan to revive Karachi's suburban rail network, including the long-awaited Karachi Circular Railway (KCR), restore key intercity train services, and develop green corridors along railway tracks to improve

mobility and environmental conditions in the city.

Sindh Minister for Transport Sharjeel Inam Memon, Local Govern-

ment Minister Syed Nasir Hussain Shah, Chief Secretary Asif Hyder Shah, Commissioner Karachi Hassan

Naqvi, and senior officials of Pakistan Railways, including Chairman Syed Mazhar Ali Shah and General Manager Hafeezullah.

Revival of suburban rail and KCR

The meeting focused extensively on restoring suburban train services in Karachi to address the city's growing transport challenges. Participants agreed that a functional suburban rail network, particularly the KCR, would provide an affordable, efficient, and environmentally friendly commuting option for mil-



The meeting, held at the Chief Minister House, was attended by

ment Minister Syed Nasir Hussain Shah, Chief Secretary Asif Hyder Shah, Commissioner Karachi Hassan

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IEEE PAPER
26
INDUSTRIAL MEGA EXHIBITION
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Islamabad, Sindh Agree on Revival of KCR, Suburban Rail and New Train Services

Contd from page 1
lions of residents.

Transport Minister Sharjeel Memon highlighted that the KCR is central to Karachi's mass transit system and, once revived, Bus Rapid Transit (BRT) systems would act as feeder networks. It was decided that the Transport Department would develop a comprehensive KCR mega project in

collaboration with a private sector partner.

Chief Minister Murad Ali Shah underscored the urgency of restoring rail-based urban mobility. He noted that Karachi requires efficient mass transit solutions to reduce traffic congestion and improve daily commuting. He also stressed the need for a coordinated federal-provincial framework to rehabilitate infra-

structure, streamline operations, and ensure reliability.

Railways Minister Hanif Abbasi assured full cooperation from Pakistan Railways, stating that the federal government is committed to modernizing suburban rail services in Karachi through joint efforts.

Malir Halt underpass to be expedited

The meeting was informed that the Sindh government plans to construct an underpass at Malir Halt, which has been delayed due to the non-issuance of a No Objection Certificate (NOC). The Railways Minister directed the authorities to issue the NOC immediately to facilitate timely execution of the project.

New train services: Karachi-Rohri and Karachi-Jacobabad

Both sides agreed to revive and launch train services between Karachi and Rohri, as well as between Karachi and Jacobabad via Kotri, Dadu, Larkana, Shikarpur, and Qambar Shahdadkot.

Local Government Minister Nasir Shah noted that these historic routes once served as vital transport links and their restoration would benefit commuters and prove economically viable for the railways.

Green corridors along railway tracks

A key environmental initiative discussed was the development of green belts and linear plantations along railway corridors, particularly from Karachi Cantonment to Jumma Goth. The Chief Minister welcomed the proposal, stating that such green

corridors would improve the urban environment, prevent encroachments, and enhance the city's landscape.

It was agreed that Sindh's Forest and Local Government departments would collaborate with Pakistan Railways to implement plantation drives with proper maintenance systems.

Anti-encroachment drive and safety measures

Encroachments on railway land were identified as a major obstacle to efficient rail operations. The meeting reviewed encroached areas along the KCR track, including Gilani Station, Gulistan-e-Jauhar, and Essa Nagri.

Murad Ali Shah directed the district administration to extend full support to Pakistan Railways in removing illegal encroachments, emphasising that public

infrastructure must be protected. Hanif Abbasi also stressed strict enforcement, terming railway land a national asset.

The issue of pending dues related to railway level crossings across Sindh was also discussed. The Chief Minister called for a comprehensive reconciliation process and directed immediate upgradation of high-risk crossings to ensure public safety.

Strengthening coordination

Both sides agreed to enhance coordination mechanisms, resolve jurisdictional issues through joint demarcation, and accelerate infrastructure development and regulatory enforcement.

Reaffirming his commitment

Contd on page 4

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IEEEEP Expo 2026 Lahore

Exhibitions Must Deliver Technology Transfer, Local Manufacturing Gains

By Manzoor Shaikh

Pakistan's growing engineering and power sector continues to position the country as a major regional hub for electrical, energy, and industrial solutions, but industry stakeholders say exhibitions must move beyond showcasing products to delivering tangible outcomes in technology transfer and local manufacturing.

With a population of over 250 million and expanding demand for electricity, energy systems, and industrial equipment, Pakistan offers a vast market for power sector businesses. This has naturally led to the emergence of large-scale exhibitions where manufacturers, importers, service providers, and policymakers converge to explore

opportunities.

In this context, the Institute of Electrical

and Electronics Engineers of Pakistan (IEEEEP) has been playing a central role, with

its Karachi and Lahore chapters regularly organizing major industrial exhibitions that



and Electronics Engineers of Pakistan (IEEEEP) has been playing a central role, with

attract a wide spectrum of participants, including exhibitors, visitors, and high-level

delegates from across the industry.

The latest edition, IEEEEP Expo 2026, scheduled from May 4 to 6 at the Expo Center Lahore, reflects this growing momentum. Organized in collaboration with Eventive Solutions Pvt Ltd, the event is expected to feature over 150 exhibitors, more than 10,000 visitors, and upwards of 100 VIP delegates.

The exhibition serves as one of Pakistan's largest platforms for electrical, power, and electronics engineering industries, showcasing a broad range of industrial products and services. It also provides foreign companies with an opportunity to introduce their technologies and explore business prospects in the region, while enabling local firms to connect with global players.

Over the years, such exhibitions have successfully boosted business activity, particularly for importers and distributors, helping

Contd on page 4

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Pakistan Cables Secures Diamond Award at Employer of the Year Awards

Pakistan Cables Ltd. is honored to receive the

Diamond Award at the 11th Employer of the Year Award organized by the Employers' Federation of Pakistan (EFP).

The award was presented by Mr. Andreas Wegner, Deputy Head of Mission at the Consulate General of Germany in Karachi, to Aadil Riaz, Director HR & Admin, Pakistan Cables.

The Company is committed to upholding the highest standards of corporate responsibility and excellence,

while continuing to contribute meaningfully to industrial growth and development in Pakistan.

er in Pakistan. Being the first and oldest wires and cables manufacturer listed on the PSX since 1955, it



Founded in 1953, Pakistan Cables is the premier and most reputable wires and cables manufacturer

has the largest geographical footprint in Pakistan with presence in over 200 cities and towns. It is also a member company of the Amir S. Chinoy group. It is ISO 9001:2015, ISO 14001:2015 and ISO 45001:2018 certified and various cables type tested by KEMA, Netherlands. The Company's science-based emission reduction targets are validated and approved by SBTi. It is also a signatory of the UN Global Compact and net zero commitment. To learn more about Pakistan Cables Ltd. - PR

IEEEP Expo 2026 Lahore

Contd from page 3

expand the availability of modern equipment and solutions in the local market. However, industry experts and participants increasingly stress that this commercial success must now translate into deeper industrial development.

"There is no doubt that exhibitions are good for business and networking, but their real success should be measured by how much technology is transferred and how much local manufacturing capacity is built," said

industry leaders, aimed at discussing future trends in energy, innovation, and industrial solutions. These sessions are expected to provide insights into emerging technologies and global developments, setting the stage for meaningful collaboration.

The opening ceremony will bring together policy-makers, business leaders, and innovators, marking the start of three days of networking, knowledge sharing, and business engagement. Organizers say the event will also emphasize business-to-



one professional.

Despite strong participation, a large proportion of exhibitors continue to represent imported products, highlighting a persistent gap in domestic manufacturing. Stakeholders note that while Pakistan has the technical expertise and market demand, the goal of developing a robust local manufacturing base for electrical equipment and components remains largely unrealized.

Industry leaders argue that exhibitions like IEEEP Expo should be leveraged more strategically to encourage joint ventures, local assembly, and eventual indigenization of technology. This includes facilitating partnerships between foreign manufacturers and Pakistani firms, promoting knowledge exchange, and aligning policies to support industrial growth.

The expo's agenda includes keynote sessions by

government (B2G) and business-to-business (B2B) interactions, with a focus on strengthening Pakistan's role in the global energy transition.

While exhibitions remain a vital platform for showcasing innovation and fostering connections, industry stakeholders emphasize that their long-term value lies in enabling Pakistan to shift from a consumption-driven market to a production-driven economy.

As one electrical engineer put it, "The real success of these exhibitions will be when we start seeing 'Made in Pakistan' electrical products competing in both local and international markets."

With growing awareness and policy focus, exhibitions like IEEEP Expo 2026 may increasingly serve not just as marketplaces, but as catalysts for industrial transformation in Pakistan's engineering sector. ■

Islamabad, Sindh Agree on Revival

Contd from page 2

ment, the Chief Minister said the Sindh government would continue to work closely with the federal government to modernise transport infrastructure, improve connectivity, and enhance the quality of life for citizens.

Rohri Railway Station upgradation launched

Separately, Railways Minister Hanif Abbasi, along with Sindh Local Government Minister Nasir Shah, laid the foundation stone for the upgradation of Rohri Railway Station.

Speaking at the ceremony, the minister said the Rs1.33 billion project would be completed within six months and would transform the historic 150-year-old station into a modern facility. He highlighted ongoing development in Sukkur and

Rohri, including improvements in education and healthcare infrastructure.

Abbasi thanked Prime Minister Shehbaz Sharif and the Sindh Chief Minister for their support. He also shared updates on key initiatives, including the ML-1 railway project and Thar coal development, noting their importance for Pakistan's economic growth.

Minister Nasir Shah termed the project a long-standing demand of the people and said the upgradation would significantly improve passenger facilities. He also announced plans to launch the "Ho Jamalo Train" in collaboration with Pakistan Railways.

Officials of Pakistan Railways and local representatives received the delegation upon arrival at Rohri Junction. ■



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UIT University Earns Global Recognition in Prestigious RISC-V Mentorship Program

UIT University has achieved a significant international milestone by being selected for the LFX Summer 2026 RISC-V Mentorship Program, marking its fifth consecutive selec-

tions from around the world, only four projects were selected, highlighting the strong research capabilities and innovation emerging from UIT. The selected projects focus on advanced RISC-V technologies, including open-source vector libraries, high-precision code development, extension mapping, and firmware valida-

UIT University underscores Pakistan's increasing presence in global engineering research and innovation. It also reflects the institution's commitment to fostering cutting-edge technological development and international collaboration in emerging fields such as open-source hardware and artificial intelligence.



tion since 2021.

UIT University, in collaboration with MERL, stood out among global applicants, with only two universities worldwide—UIT and Massachusetts Institute of Technology—receiving recognition in this highly competitive program.

Out of numerous submis-

sion on hardware platforms.

One of the key highlighted initiatives is the "RV-Sparse" project, aimed at developing faster, smarter, and more energy-efficient AI hardware solutions, reflecting the growing importance of sustainable and high-performance computing.

The continued selection of

Academics and industry observers view this achievement as a positive signal for Pakistan's engineering education sector, demonstrating that local institutions can compete at the highest global levels when provided with the right platforms and opportunities. — ER Report

FCDO Delegation from British High Commission Meets ACEP in Karachi

A delegation from the United Kingdom Government's Aid Commercial Expertise Programme, through the Foreign, Commonwealth & Development Office (FCDO), British High

commercial challenges, and opportunities for collaboration.

The engagement forms part of the UK Government's ongoing efforts under the ACEP initiative to support improved practices and strengthen institutional capacity in partner countries. Discussions focused on

Growth Advisor and First Secretary Trade and Economy, Private Sector Team), who engaged with ACEP representatives in a constructive exchange of insights on enhancing project delivery mechanisms and governance frameworks.

ACEP emphasized the importance of sustained collaboration, knowledge shar-



Commission, Islamabad, held a meeting in Karachi with representatives of the Association of Consulting Engineers Pakistan (ACEP) to discuss sectoral priorities, com-

understanding the current project environment, identifying key challenges, and exploring avenues for technical and strategic cooperation.

The delegation included Mr. Louie Dane (Senior Economic Advisor and Macroeconomic Stability and Growth Team Leader) and Ms. Sabiha Ahmed (Green

ing, and alignment with international best practices to improve efficiency, transparency, and overall sector performance.

The meeting concluded with a mutual understanding to continue engagement and explore potential areas for future cooperation under the ACEP framework. - PR

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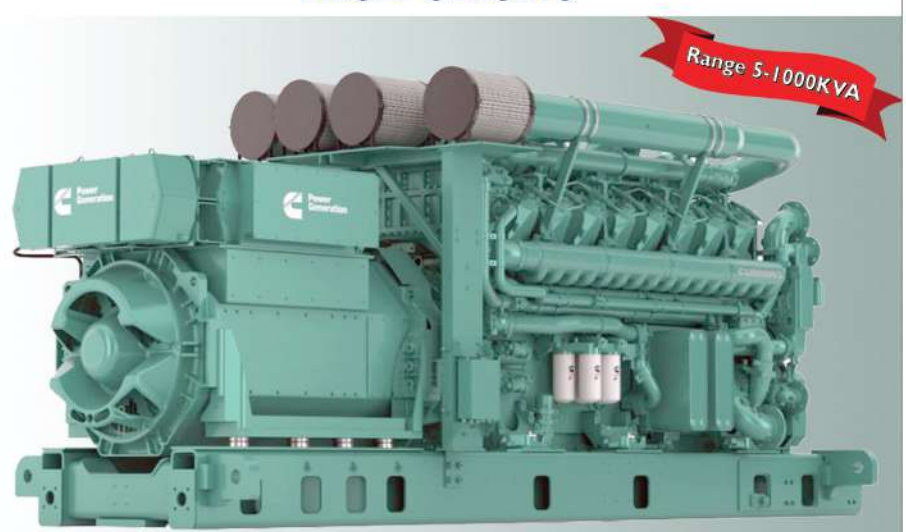


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AI Innovation in Condition Monitoring of High-Voltage Line Insulators

Mehran University of Engineering and Technology (MUET), Jamshoro, proudly announces a significant academic and technological milestone achieved by its research scholar, Mr. Shafi Muhammad Jiskani, who has successfully completed his PhD in high-voltage power system monitoring.

His research presents a transformative solution to one of Pakistan's longstanding challenges in electrical power transmission.

Mr. Jiskani's doctoral research, titled "Leveraging Indigenous Dataset-Based Condition Monitoring of High Voltage Line Insulators through Deep Learning Model," focuses on the intelligent detection of faulty insulators in 500 kV transmission networks. These insulators, when degraded or damaged, are a major cause of ground faults, leading to frequent transmission line trips and widespread power outages across the country.

Addressing this critical issue, Mr. Jiskani developed a deep learning-based condition monitoring system that can identify defective insulators

before the inception of faults, thereby significantly improving the reliability and stability of Pakistan's power grid. A key innovation of this research lies in overcoming the challenge of dataset scarcity by leveraging indigenous data tailored to local environmental and operational conditions.

This research directly contributes to solving a pressing problem faced by the National Grid System (NGS), formerly known as NTDCL, where aging transmission infrastructure often suffers from insulator failures. By enabling early detection, the proposed system has the potential to reduce outages, enhance grid performance, and lower maintenance costs.

The PhD research was conducted under a joint supervision program between Mehran UET, Pakistan, and Dublin City University (DCU), Ireland,

under the prestigious Erasmus+ International Credit

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This research directly

proposed system has the potential to reduce outages, enhance grid performance, and lower maintenance costs.

The PhD research was conducted under a joint supervi-

lenges.

Mr. Jiskani was supervised by a distinguished team of scholars, including Prof. Dr. Tanweer Hussain, Dr. Faheemullah Shaikh, and Dr. Anwar Ali Sahito from Mehran UET, and Dr. Inam Ul Ahad from DCU. The research was generously funded by ICTEF4SD, Sindh Higher Education Commission (HEC), and the Erasmus+ program, reflecting a collaborative investment in innovation and capacity building.

This achievement underscores the vital role of global academic linkages and international collaboration in addressing complex engineering problems. It highlights how partnerships between academia and industry can lead to practical, high-impact solutions that directly benefit national infrastructure.

Mehran UET emphasizes that such collaborative efforts are essential for fostering innovation, strengthening research capacity, and positioning Pakistani institutions at the forefront of global technological advancement. The university reiterates the importance of continued academic partnerships, industrial engagement, and international cooperation to drive sustainable development and engineering excellence in Pakistan. ■



Mobility (ICM) agreement. As part of this collaboration, Mr. Jiskani was hosted at the School of Mechanical and Manufacturing Engineering at

contributes to solving a pressing problem faced by the National Grid System (NGS), formerly known as NTDCL, where aging transmission

program between Mehran UET, Pakistan, and Dublin City University (DCU), Ireland, under the prestigious Erasmus+ International Credit Mobility (ICM) agreement. As part of this collaboration, Mr. Jiskani was hosted at the School of Mechanical and Manufacturing Engineering at DCU, where he benefited from advanced research facilities and international academic exposure.

The research activities were carried out at the National Centre of Robotics and Automation (NCRA) laboratory, with valuable technical and logistical support from NTDCL, ensuring strong alignment with real-world industrial chal-

DCU, where he benefited from advanced research facilities and international aca-

infrastructure often suffers from insulator failures. By enabling early detection, the

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ADB, NHA Sign Agreement to Launch Long-Stalled M6 Motorway Project

Federal Minister for Communications Abdul Aleem Khan has welcomed the signing of a major financing and implementation agreement between the Asian Development Bank and the National Highway Authority for the construction of the long-awaited M6 Motorway, linking Karachi with Sukkur.

Describing the agreement as a “landmark breakthrough,” the minister said the project would serve as a critical pillar for Pakistan’s economic future and significantly enhance national connectivity. He noted that the M6 Motorway—stretching approximately 306 kilometers—would complete the missing segment of the country’s north-south motorway corridor, enabling uninterrupted travel from Karachi to Peshawar and onward to Gilgit.

Under the agreement, ADB will provide financial and technical support for key sections of the project, particularly focusing on sustainable infrastructure, transparent procurement, and international best practices

in project execution. The agreement also includes provisions for institutional capacity building, environmental safeguards, and improved road safety standards, aligning the motorway with global infrastructure benchmarks.

investment and ensure operational efficiency. Meanwhile, financing for other sections has already been secured from multilateral partners, including the Islamic Development Bank and the OPEC Fund for International Development.

expected to significantly reduce travel time, lower transportation costs, and improve logistics efficiency, particularly for goods transported to and from Karachi’s ports.

The minister highlighted that the project had

slowed progress.

He said the current government, through sustained efforts over the past two years, successfully addressed these longstanding issues by engaging international development partners and restructuring the project into bank-

of the country’s trade corridors. By connecting Karachi’s ports with the industrial and agricultural heartlands of Sindh and beyond, the motorway is expected to boost exports, facilitate regional trade, and support economic integration.

He added that improved connectivity would also benefit local communities along the route by creating employment opportunities, promoting industrial growth, and enhancing access to markets and services.

Reaffirming the government’s commitment, the minister stated that the entire M6 Motorway project is targeted for completion within two years. He expressed confidence that with continued support from international financial institutions and private sector partners, the project would be delivered on schedule.

“The revival of the M6 Motorway is not just an infrastructure project; it is a strategic investment in Pakistan’s future,” he said. “It will strengthen national unity, improve economic resilience, and position Pakistan as a key transit hub in the region.”

The agreement marks a significant step forward in addressing one of Pakistan’s most critical infrastructure gaps, long viewed as essential for sustaining economic growth and enhancing regional connectivity. ■



The M6 project will be developed through a hybrid financing model. Two sections, from Hyderabad to Nawabshah, will be executed under a Public-Private Partnership (PPP) framework to attract private

Officials said the motorway would be a six-lane, access-controlled facility equipped with modern tolling systems, advanced safety features, 15 interchanges, and 10 service areas. Once completed, it is

remained stalled for over three decades due to a combination of financial constraints, shifting policy priorities, and delays in structuring viable investment models. Previous attempts to launch the motorway faced hurdles in securing long-term funding, while political transitions and administrative bottlenecks further

able segments. This approach enabled the government to revive investor confidence and move the project toward implementation.

Abdul Aleem Khan termed the M6 Motorway the “missing economic link” in Pakistan’s transport network, emphasizing that its completion is essential for unlocking the full potential

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Punjab Affordable Housing Program Reviewed

The 12th meeting of the Program Steering Committee (PSC) of the Punjab

ment moves to accelerate low-cost housing initiatives across the province.

The meeting brought together senior officials,

aimed at improving access to affordable housing for low- and middle-income groups.

Participants reviewed progress made so far, including land identification,



Affordable Housing Program was held to review progress and deliberate on future strategy, as the govern-

ment partners, and key stakeholders to assess implementation status, address operational challenges, and refine policy direction for the program

financing mechanisms, and construction activities under various housing schemes. Officials noted that while initial phases have seen steady

Contd on page 0

Pakistan, China Explore Skills and Investment Opportunities at TVET Symposium in Beijing

The Embassy of Pakistan in Beijing hosted a Technical and Vocational Education and Training (TVET) Symposium focused on home appliances, electrical equipment, and battery and power storage manufacturing.

The event, themed "Building Partnerships for Skills Development and Academia-Industry Collaboration," brought together Chinese enterprises, leading TVET institutions, and Pakistani companies to explore investment and skills development opportunities in these high-potential sectors.

Officials from China's Ministry of Human Resources and Social Security, along with 41 participants from Chinese TVET institutions and companies, attended the symposium. Pakistan's Minister for Planning, the Special Assistant to the Prime Minister (SAPM) on Industries, the Chairperson of NAVTTC, and representatives of Pakistani companies

participated online.

Pakistan's Ambassador to China, Khalil Hashmi, emphasized the Embassy's commitment to prioritizing and pursuing sector-specific, outcome-oriented collaboration in TVET. Building on the success of the December 2025 TVET Forum on Agriculture, he noted that the symposium served as a preparatory platform for the upcoming B2B Investment Conference on home appliances, electrical equipment, and battery energy and home

Corridor in human resource development and skills transfer.

Federal Minister for Planning, Development and Special Initiatives, Ahsan Iqbal, addressed the symposium via a recorded message, noting Pakistan's growing home appliances market valued at \$5.6 billion and a 75 percent surge in electrical equipment imports to nearly \$6 billion last year.

He stressed that skilled technicians could bridge the gap between import depend-

programs and centers of excellence. Gulmina Bilal Ahmed, Chairperson of NAVTTC, emphasized joint training programs and industry-led apprenticeships under CPEC. Muhammad Ayaz, Trade and Investment Attaché at the Embassy of Pakistan in Beijing, presented cooperation models across 21 priority sectors, including EVs, electronics, and ICT.

Later, Chinese TVET institutions showcased their strengths and expressed keen interest in collaborating with companies investing in Pakistan's priority sectors. Their presentations were followed by interactive discussions on needs, opportunities, and proposals for collaboration with Pakistani companies.

In his concluding remarks, Ambassador Hashmi reaffirmed the Embassy's dedication to translating dialogue into tangible, sector-driven outcomes. He appreciated Chinese institutions that expressed willingness to attend the Pakistan-China B2B Investment Conference in Lahore on May 9-10, focusing on home appliances, electrical equipment, and battery and power storage sectors. — ER/PID



storage system manufacturing, scheduled for May 9-10, 2026, in Lahore. He encouraged Chinese enterprises to actively participate to foster joint ventures and business partnerships.

He underscored that TVET lies at the core of industrial development and economic resilience, reiterating that a skilled workforce is essential to fully harness foreign investment in Pakistan. He also highlighted expanding cooperation under the China-Pakistan Economic

ence and domestic production. He cited the "Livelihood Corridor" under CPEC 2.0 and the "URAAN Pakistan" framework as strategic opportunities for collaboration, reaffirming the government's commitment to upgrading 250 TVET centers and launching a 60,000-person paid internship program.

Haroon Akhtar, Special Assistant to the Prime Minister for Industries and Production, called for greater collaboration with Chinese partners to develop training

Chashma Sugar Mills Initiates Modernization at D.I. Khan Unit

Chashma Sugar Mills Limited has commenced the modernization of its plant and machinery at its CSM Unit-II in Ramak, Dera Ismail Khan, as

The move is aligned with the company's long-term strategy to upgrade infrastructure, improve productivity, and strengthen its position in the ethanol and sugar sectors.

The company has requested the PSX to disseminate the information



part of its growth and expansion strategy.

In a disclosure submitted to the Pakistan Stock Exchange, the company stated that it is also installing molecular sieves at its ethanol fuel plant to enhance operational efficiency and production capacity.

among market participants in accordance with regulatory requirements.

Market analysts view the development as a positive step toward modernization and value addition in Pakistan's agro-based industry, particularly in the ethanol segment. — ER News Desk

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logical change, JC continues to adopt emerging technologies, including smart automation, energy-efficient systems, and advanced power management solutions. This forward-thinking approach reinforces its status as a trusted technical partner, enabling industries to achieve operational



consultation to after-sales support, every interaction with JC reflects their dedication. Their team of experts is committed to providing customized solutions and building lasting relationships with their customers. Whether customers need advice on selecting the best products for their

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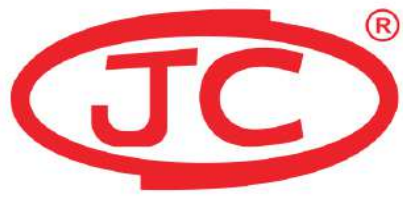


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IEEC 2026 Concludes with Focus on Innovation, Sustainability and Industry Linkages

The 11th International Electrical Engineering Council Conference 2026 (IEEC 2026), a two-day event, concluded at Shah Mahmood Alam Auditorium Main Campus NED University Karachi, after bringing together a large number of engineers, professionals, and students for knowledge exchange and technical discussions.

The conference, held under the theme "Innovating Power & Intelligence for Shaping a Sustainable Future," highlighted the growing role of advanced technologies in transforming the energy and engineering

sectors.

On the first day, Conference Convenor Engr. Saad Ahmed Kazi informed partic-

ipants that over 20 universities and institutions, including international contributors from China, Malaysia, and

Nigeria, presented research papers covering areas such as power systems, artificial intelligence (AI), Internet of

needs, while IEP President Engr. Sohail Bashir emphasized strengthening academia-industry collaboration

tance of continued engagement between academia and industry.

Distinguished keynote addresses were delivered by academic and industrial experts, followed by remarks from Engr. Sohail Bashir, President IEP. The chief guest also addressed the participants, acknowledging the importance of engineering innovation in national development.

Dr. Noman Ahmed, Pro Vice Chancellor of NED University and Patron of IEEC 2026, also shared his views during the closing session.

Conference recommendations were presented by Engr. Dr. Fezan Rafique, Technical Chair of IEEC 2026, summarizing key insights from the technical sessions. The event also included the Chairman's



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Things (IoT), and emerging technologies.

Industry keynote speaker Danish Zahoor, CEO of Barqtron, emphasized the urgent need to improve Pakistan's power transmission and distribution systems. He noted

through incentives, commercialization of research, and regulatory support.

Vice Chancellor of NED University, Dr. Muhammad Tufail, also addressed the conference, underlining the importance of such platforms

Medal for Best Paper and Best Poster Awards, recognizing outstanding research contributions.

Mementos were distributed among speakers and participants, followed by a vote of thanks by Engr. Dr.



that despite having a generation capacity of around 44,000 MW, inefficiencies in transmission and distribution limit effective utilization. He stressed the importance of

in fostering innovation and collaboration.

Closing Session Highlights
The conference concluded with a comprehensive closing session featuring key address-

Raja Masood Larik, Conference Secretary, IEEC 2026.

The conference concluded with a group photograph, marking the successful completion of the two-day inter-



solar energy adoption and battery storage systems, urging local development in energy storage technologies.

Jasrul Jamani from the University of Technology Malaysia highlighted the importance of aligning academic research with industry

es, recommendations, and recognition of participants.

The session began with conference highlights presented by Prof. Dr. Attaullah Khawaja, Chairman IEEE NED UET Student Branch Counsellor. The conference was informed of the impor-

national event.

Organizers noted that IEEC 2026 served as an important platform for dialogue, innovation, and collaboration, reinforcing Pakistan's growing engagement with global engineering communities. – ER Report

Probe Ordered into Off-Merit Power Procurement by DISCOs

Federal Minister for Power Sardar Awaiz Ahmed Khan Leghari has taken serious notice of irregularities in electricity procurement by distribution companies (DISCOs), after it emerged that power was being purchased from Small Power Producers (SPPs) and Captive Power Plants (CPPs) at tariffs higher than the national merit order.

The issue came to light during a recent stock-taking exercise of DISCOs conducted by the Power Division, where discrepancies were identified in the off-take of electricity. Officials found that certain DISCOs were procuring power outside the prescribed Economic Merit Order (EMO), leading to higher costs being passed on to consumers.

Taking immediate action, the minister directed that the practice be discontinued forthwith and aligned with the regulatory framework set by the National Electric Power Regulatory Authority, including the Grid Code and Distribution Code.

He also ordered a formal inquiry to investigate the matter, determine responsibility, and recommend corrective measures to prevent recurrence.

"The procurement of electricity must strictly follow the least-cost principle to protect consumers from unnecessary financial burden," the minister said, emphasizing that any

deviation from the merit order would not be tolerated.

In line with these directives, the Power Division has issued instructions to all DISCOs, clearly stating that no off-merit procurement from SPPs or CPPs will be allowed with-

including SPPs and CPPs, are dispatched strictly in accordance with EMO principles, ensuring cost efficiency in the system.

According to the new instructions, electricity off-take from SPPs will only be permitted when it falls within the prevailing national merit order, determined on the basis of incremental generation cost through the prescribed regulatory mechanism.

Energy experts note that adherence to the merit order is critical for maintaining affordability in the power sector, as deviations can significantly increase the overall cost of electricity generation and ultimately impact end consumers.

The development underscores the government's renewed focus on transparency, regulatory compliance, and financial discipline in the power sector, amid ongoing efforts to reduce circular debt and improve efficiency across the energy value chain. – ER Report



out prior explicit approval from the Independent System and Market Operator (ISMO).

The minister further directed enhanced coordination with ISMO to ensure that all power generation units,

Punjab Affordable Housing Program Reviewed

Contd from page 1
advancement, challenges remain in areas such as land acquisition, cost escalation, and coordination among implementing agencies.

The Punjab Affordable Housing Programme, supported by international development partners including the World Bank, is designed to promote inclusive urban development by facilitating access to housing finance, encouraging private sector participation, and strengthening institutional capacity.

During the meeting,

ing must be integrated with transport, water, and sanitation systems to ensure livable communities rather than isolated housing units.

The PSC also reviewed financial models under the programme, including mortgage facilitation and risk-sharing instruments aimed at making housing loans more accessible to underserved segments. Stakeholders stressed the importance of maintaining affordability while ensuring project viability for developers and investors.



emphasis was placed on improving delivery timelines, enhancing transparency, and ensuring that subsidies and financing tools effectively reach intended beneficiaries. The committee also discussed mechanisms to streamline approval processes and reduce procedural delays that have slowed project execution in some areas.

A key focus of the discussions was the need to align housing development with broader urban planning objectives, including infrastructure provision, access to utilities, and environmental sustainability. Officials highlighted that affordable hous-

The latest review reflects the government's continued commitment to addressing Pakistan's housing shortfall through structured, policy-driven interventions. With rapid urbanization placing increasing pressure on cities, officials reiterated that scaling up affordable housing remains a priority for sustainable economic and social development.

The meeting concluded with a consensus on accelerating implementation, strengthening coordination among stakeholders, and ensuring that the programme delivers tangible benefits to citizens in line with its objectives. – ERMD

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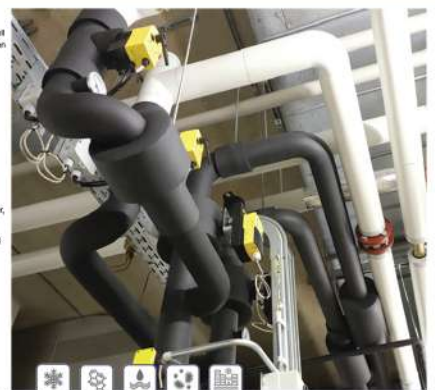


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Why Higher Education Must Embrace AI?

By: Prof. Dr. Tariq Rahim Soomro, SMIEEE.

For the past few years, I have watched a quiet panic spread through faculty lounges and administrative meetings. The catalyst is Large Language Models (LLMs) like ChatGPT, Gemini, DeepSeek, and Claude.

The initial reaction—widespread bans, AI detectors, and threats of academic integrity violations—was understandable, but misguided. As a computer scientist and an academician, I argue that this "blockade mindset" is not only pointless, but actively harmful to our students and our institutions.

We are failing our students because we are clinging to a pre-digital pedagogy. If higher education is to survive the AI era, faculty members must stop policing and start teaching. We need a fundamental shift from a mindset of prohibition to a mindset of integration and embracement.

The Current Mindset: The prevailing logic among many faculty members is that if a student uses AI to generate text or code, the student has not learned.

This rests on an outdated assumption that "thinking" is solely a solitary, slow, and struggle-filled process. Consequently, top management has wasted millions on ineffective "AI detection" software—tools that are notoriously biased against non-native English speakers and easily fooled.

This mindset fails for three reasons. First, AI is now a background utility, like electricity or the Internet; you cannot ban it in the dorm room, while allowing it in the library. Second, the modern workplace explicitly requires AI literacy. By banning AI, we are sending graduates into a workforce, where they are less productive than their peers. Third, the "gotcha" model of education destroys trust. When students fear punishment for using the best tool available, they hide their usage rather than learning ethical applications.

The Future Mindset: The future university must view AI not as a cheating device, but as a cognitive exoskeleton—a tool that enhances, rather than replaces, human reasoning. This requires a complete redesign of assessment and pedagogy, specially from primary education to higher

education.

Faculty members must adopt "process-oriented" teaching methodologies. Instead of grading a final essay, we should grade the dialogue between the student and the AI. For example, in computer science, asking a student to write a sorting algorithm from scratch is now a waste of time. Instead, ask them to use AI to generate three different sorting algorithms, then write a critical report on their time complexity, memory usage, and edge cases. The student learns architecture and evaluation, which are higher-order skills than syntax memorization.

Logical Reasonings: Banning AI in education is equivalent to banning calculators in the 1980s after the invention of the micro-processor. Initially, math teachers worried students would forget arithmetic. They were right—students stopped doing long division by hand. But they learned algebra, calculus, and statistics. The goal shifted from computation to application. Similarly, we must shift from information retrieval to information synthesis. AI is here; it is not leaving. Our choice is

not whether students use it, but whether they use it intelligently.

Prohibiting AI tools actively harms disadvantaged students. Wealthy students will always have access to private tutors and undetectable, premium AI models. Poor students, relying on outdated library terminals and university proctoring software, will be left behind. By officially allowing and teaching AI use, level the playing field. When an institution provides a standard AI tool and trains everyone to use it, we eliminate the underground economy of cheating and replace it with transparent skill-building.

The traditional lecture—where a professor distributes facts that students regurgitate—is obsolete. AI is a better fact-dispenser than any human. The unique value of a human professor is now context, ethics, and creativity. We must teach students how to ask the right questions (prompt engineering), how to verify answers (lateral reading), and how to apply solutions to messy, real-world problems (experiential learning). Faculty who refuse to adopt these methodologies are not pro-

tecting standards; they are renouncing their only remaining unique value proposition.

For university top management, the risk is existential. If you maintain that a degree represents "knowledge earned without AI assistance," you will lose the market. Corporate recruiters already report that they prefer candidates with proven AI augmented workflow skills over traditional high-GPA candidates. If universities do not certify AI literacy, private bootcamps and corporate academies will. Management must rewrite academic integrity policies to define unauthorized AI use (e.g., copying without attribution) versus authorized use (e.g., brainstorming or first draft generation). Faculty must be given release time and training to redesign 20-30% of their assessments for this new paradigm.

A Call to Action To my fellow faculty: Stop asking "How do I catch them?" and start asking "How do I challenge them?" Design assignments, where raw AI output is a starting line, not a finish line. To administrators: Fund faculty development, not surveillance software. Change the honor



code to reward transparency.

The AI era does not spell the end of higher education. It spells the end of lazy higher education. The professors who will thrive are those who treat AI as a co-pilot. The institutions that will lead are those that change their mindset from prohibition to permission (positive integration). Let us not be the gatekeepers of a dead past. Let us be the architects of an augmented future.

Disclaimer: Article is fine-tuned using DeepSeek.

Prof. Dr. Tariq Rahim Soomro, is the Rector, at the Institute of Business Management (IoBM), Karachi and is having more than 31 years of experience in academia and industry. He can be reached at tariq-soomr@gmail.com ■

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PSDP Projects Reviewed, New Infrastructure Schemes for Next Year Approved

Sindh Chief Minister Syed Murad Ali Shah chaired a high-level meeting to review the progress of major development projects under the Federal Public Sector

was attended by Planning and Development Minister Jam Khan Shoro, Works Minister Haji Ali Hassan Zardari, Chief Secretary Asif Hyder Shah, P&D Chairman Najam Shah, Finance Secretary Fayaz Jatoti, Works Secretary Nawaz Soho, Secretary to CM Asif Jameel, Irrigation

the 36-kilometer extension of the Sindh Coastal Highway, improvement of the 150-kilometer Rohri-Guddu Barrage Road, dualization of the 31.4-kilometer Tando Allahyar-Tando Adam Road, dualization of the 135-kilometer Mehran Highway from Nawabshah



Development Program (PSDP) 2025-26 and finalized the strategy for PSDP 2026-27, with a strong focus on road infrastructure, regional connectivity, and economic growth.

The meeting, held at the Chief Minister's House,

Secretary Zarif Khoro, and other senior officials.

The Chief Minister was informed that five major road infrastructure projects, with a combined cost exceeding Rs140.9 billion, are currently underway with joint funding from federal and provincial governments. These include

to Ranipur, and improvement of the 221-kilometer Sanghar-Rohri (N-5) Road.

Officials briefed the meeting that substantial progress has been achieved on several projects, while others are in tendering or early execution stages.

During the current fiscal

Contd on page 15

Power Division Signs IFC Deal for 10 Million Smart Meters Rollout

The Ministry of Energy (Power Division) has signed a Transaction Advisory Services Agreement (TASA) with the International Finance Corporation, a member of the World Bank Group, says a federal government information on PID website.

Under this agreement, the IFC will act as transaction advisor and conduct a comprehensive techno-commercial assessment for a service-provider model or public-private partnership framework to support the large-scale rollout of smart metering infrastructure for 10 million single-phase connections. This initiative aims to attract local and international investors to install, maintain, and operate the infrastructure, thereby advancing Pakistan's digital transformation in the power sector.

The Ministry has accelerated the digitization reform of the national power distribution network. The reform seeks to replace legacy systems with modern infrastructure, thereby enhancing transparency, operational efficiency, and long-term financial viability.

Advanced Smart Metering Infrastructure (AMI) forms the cornerstone of this transformation. Smart meters provide real-time visibility of energy consumption, reduce theft through anomaly detection, improve billing accuracy and recovery rates, and minimize manual errors by reducing human intervention.

Through an international competitive bidding process, the Ministry has reduced the price of both single-phase and three-phase smart meters by 40 percent, delivering substantial savings to the national exchequer and, ultimately, to consumers. All distribution companies have been directed to install smart



meters for every new electricity connection, with no traditional meters to be issued to new applicants. In addition, all existing three-phase consumer meters must be converted to smart meters within a defined timeline, ensuring that commercial and industrial consumers are fully integrated into the digital system.

To address the longstanding issue of faulty and defective meters, the Ministry has collaborated closely with the National Electric Power Regulatory Authority. In its recent determinations on distribution investment plans, NEPRA has authorized distribution companies to replace defective meters with smart meters, thereby expediting the nationwide transition to a fully digital grid.

The Ministry of Energy (Power Division) reaffirmed its commitment to the Prime Minister's vision of an efficient, transparent, and consumer-centric power sector that delivers reliable electricity services across Pakistan. ■

PSDP Projects Reviewed, New Infrastructure Schemes for Next Year Approved

Contd from page 14

year, Rs17.94 billion has so far been released, with expenditures gradually increasing as work advances.

Murad Ali Shah directed all departments to accelerate the pace of work and remove bottlenecks immediately, including the relocation of utility lines, electricity poles, and the removal of encroachments. He emphasized that delays due to administrative or technical issues would not be tolerated and instructed all departments to ensure close coordination for timely completion of projects.

He particularly stressed the need to expedite the shifting of Sui gas pipelines, electricity infrastructure, and water channels, which have been causing delays in project execution.

The Chief Minister also underscored that there should be no compromise on construction quality. "These road projects are the lifeline of our economy. They must be completed on time and built to sustainable standards to maximize public benefit," he said.

Highlighting the broader impact, he noted that improved road infrastructure would boost trade, reduce travel time, and strengthen agriculture, industry, and regional connectivity across the province.

The meeting also

reviewed proposed projects for PSDP 2026-27 and granted in-principle approval to three key schemes. These include the construction of an additional carriageway from Jacobabad Bypass to Kandhkot (100 kilometers), dualization of the Thatta-Sujawal-Badin Road (112 kilometers), and development of a dual carriageway from Dadu to Dokri via key locations (84 kilometers).

Murad Ali Shah stated that these projects would significantly enhance connectivity between upper and lower Sindh, facilitate the transportation of goods, and promote economic activities, particularly in agriculture, fisheries, and coastal trade.

He reiterated that infrastructure development remains a central pillar of Sindh's growth strategy, adding that improved roads lead to better connectivity, stronger markets, and increased employment opportunities. "These projects will open new avenues of economic activity in underdeveloped areas," he said.

Reaffirming his commitment, the Chief Minister directed strict monitoring of all PSDP projects and emphasized the need for efficient utilization of funds. He stressed that every project must deliver tangible economic and social benefits to the people of Sindh. - ERMD

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Agriculture Review



President Zardari Orders Fast-Tracking of Small Dams, Recharge Wells, Storage Projects

President Asif Ali Zardari chaired a meeting on water resources management

affecting Pakistan's water security.

The President expressed concern over India's weaponization of water by suspending the Indus

importance of safeguarding Pakistan's water rights and ensuring that all necessary diplomatic and legal measures are pursued.

Addressing the issue of

across the country. He stressed that any load management should be carried out strictly in a transparent and declared manner, in line with prior public

storage infrastructure be expedited. The President emphasised that conserving water is a national imperative, particularly in the current regional climate.

for Water Resources; Mr. Ahsan Iqbal Chaudhry, Federal Minister for Planning Development and Special Initiatives; Sardar Awais Ahmad Khan



at Aiwan-e-Sadr.

The meeting reviewed issues related to water availability, governance, and regional developments

Waters Treaty. He noted that the attempt to use water as a political tool is a matter of serious consequence. He emphasised the

energy shortfalls linked to the regional situation, the President directed that all possible efforts be made to minimise load shedding

announcements, so that citizens are fully informed and disruption is reduced.

The President also directed authorities to accelerate water conservation efforts across the country. He called for the swift implementation of rainwater harvesting initiatives at domestic, commercial, and industrial levels, and directed that construction of small dams, recharge wells, and water

The meeting also discussed broader regional developments. The President noted that stability in the region remains essential and expressed confidence that, with constructive engagement and sustained efforts by Pakistan, a workable path forward in the evolving situation involving Iran could be achieved.

Mr. Muhammad Moeen Wattoo, Federal Minister

Leghari, Federal Minister for Energy; Senator Rana Sanaullah Khan, Adviser to the Prime Minister on Political and Public Affairs and Inter Provincial Coordination; Senator Saleem Mandviwala; Senator Sherry Rehman; Secretary Water Resources; Chairman WAPDA and Pakistan Commissioner for Indus Water were present during the meeting. – ER News Desk

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CM Sindh Approves Land for 6 MGD Water Treatment Plant in Hyderabad

Syed Murad Ali Shah has approved the allocation of land for the construction of a 6 million gallons per day (MGD) rapid gravity water treatment plant.

Shah chaired a high-level

meeting that the Hyderabad Municipal Corporation had requested land for the project in Deh Jamshoro, Taluka Qasimabad, under the Annual Development Programme (ADP). District authorities identified around 25 acres of land in village Misri Sheikh, of which 22 acres fall under "A-1" category and are suit-

able for immediate use. He directed authorities to expedite work on the project and ensure swift completion of all legal and administrative formalities.

He noted that the project would not only help address water shortages but also play



meeting at the Chief Minister House. The meeting was attended by Planning and Development and Irrigation Minister Jam Khan Shoro, Chief Secretary Asif Hyder Shah, and other senior officials.

During the briefing, Jam Khan Shoro informed the

able for immediate use.

The Chief Minister approved the allocation of approximately 14-22 acres of land in the name of the Mayor of Hyderabad Municipal Corporation for the establishment of the water treatment facility.

Murad Ali Shah emphasized that the provision of clean and safe drinking water

a vital role in improving public health, enhancing quality of life, and promoting sustainable urban development.

The meeting concluded with directives from the Chief Minister to ensure transparency and strict monitoring throughout the implementation of the project. – ER Report

Beyond Steel: The Engineering Case for Type IV Composite LPG Cylinders in Pakistan

By: Adnan Riaz

1. The Material Science of Safety

For over half a century, Pakistan's LPG infrastructure has relied almost exclusively on Type I steel cylinders. However, as of 2026, the engineering landscape is pivoting toward Type IV Composite technology.

A Type IV vessel consists of a seamless, non-load-sharing high-density polyethylene (HDPE) liner, overwrapped with high-strength E-glass or carbon fiber filaments impregnated with a high-performance epoxy resin matrix. Unlike steel, which is prone to fatigue and atmospheric corrosion—particularly in high-humidity coastal hubs like Karachi—the composite matrix offers a non-corrosive, "leak-before-burst" failure mode. From a thermodynamics perspective, the insulating properties of fiberglass prevent the rapid heat transfer that leads to Boiling Liquid Expanding Vapor Explosions (BLEVE) in conventional metal tanks.

2. Technical Benchmarks & Testing Standards

For local engineering ventures and manufacturing startups, the path to market is governed by rigorous international protocols. Any locally manufactured or reverse-engineered cylinder must adhere to:

- ISO 11119-3:2020: The definitive standard for composite gas cylinders with non-load-sharing liners.
- Hydrostatic Pressure Testing: Vessels must withstand burst pressures typically exceeding 2x to 3x their working pressure

(approx. 30 bar for LPG).

- Cycle Testing: A mandatory requirement to survive 12,000+



expansion/contraction cycles, simulating a 30-year service life.

- Environmental & Fire Testing: Specialized "Bonfire Tests" ensure that the cylinder vents gas safely under extreme heat rather than fragmenting.

3. The Early Adopters: Local Pioneers

The transition is already being validated by Pakistan's energy giants, proving that the market is ready for local manufacturing:

- Pakistan State Oil (PSO): Their Blue LPG initiative has successfully deployed composite cylinders in rugged northern terrains like Gilgit-Baltistan, leveraging the lightweight advantage for difficult logistics.

- SSGC (Pvt.) Limited: By introducing "Blast-Proof" cylinders to the urban Karachi market, they have created

a massive consumer pull for safety-centric designs.

- Burshane LPG & Burhan Gas Company (BGC): These players have integrated composite distribution into their core models, highlighting features like "Visible Gas Levels" to build consumer trust.

4. Economic Dynamics & Export Potential

With the April 2026 LPG price adjustments, the "Total Cost of Ownership" (TCO)

is now a critical metric. Type IV cylinders are 50-70% lighter than steel, drastically reducing the carbon footprint and fuel costs of primary distribution.

Furthermore, Pakistan is uniquely positioned to serve the Sub-Saharan Africa and MENA regions. With over \$2.2 billion committed to clean cooking programs across Africa, there is a staggering demand for affordable, high-safety LPG infrastructure. The global composite cylinder market is projected to reach \$1.45 billion in 2026, presenting a "Blue Ocean" opportunity for Pakistani engineers to provide indigenous, "CBAM-compliant" (low carbon) alternatives to expensive European imports.

5. Conclusion: A New Technical Frontier

The shift from metal to composites is more than a product swap; it is the birth of a specialized technical sector in Pakistan. This transition demands a new generation of Composite Technicians, Filament Winding Operators, and NDT (Non-Destructive Testing) Specialists. For the Pakistani engineering community, the fiberglass revolution is the current industrial mandate for a safer, more transparent, and export-oriented energy future. ■



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Digital Ecosystems for Sustainable Global Supply Chains

Engr. Dr. Muhammad Nawaz Iqbal

Digital ecosystems are quickly re-architecting global supply chains by bringing together a wide range of participants, including firms, suppliers, logistics providers, regulators, and consumers, into interdependent, data-driven networks.

Unlike traditional linear supply chains, digital ecosystems are dynamic and adaptive systems with real-time information flows that allow quicker decision-making and more responsive reactions to disruptions. This shift is especially relevant for sustainability, as it provides a framework to align economic efficiency with environmental protection and social responsibility in geographically distributed operations.

The fundamental concept of digital ecosystems is interoperability, or the ability of various platforms, technologies, and organizations to share data seamlessly. Through standardized protocols and common digital infrastructures, supply chain partners can coordinate production schedules, inventory, and transportation operations. This interoperability reduces redundancies and inefficiencies, ultimately lowering carbon emissions and resource waste. Additionally, it enables a transition to predictive supply chain management, where potential disruptions or inefficiencies are identified and mitigated before they escalate.

The use of advanced technologies, including artificial intelligence, blockchain, and the Internet of Things (IoT), enhances the intelligence and transparency of digital ecosystems. AI-based analytics can optimize routing, accurately predict demand, and recommend sustainable sourcing solutions. Blockchain is essential for ensuring traceability and trust, as it provides immutable records of transactions and product origins, which are crucial for ethical sourcing and compliance with environmental standards. IoT devices offer real-time tracking of goods, allowing accurate monitoring of conditions such as temperature, humidity, and energy consumption.

Visibility is increasingly critical for sustainability in global supply chains, and digital ecosystems offer unprecedented transparency. Organizations can monitor the environmental footprint of their products from raw material extraction to final delivery. This end-to-end visibility enables companies to identify high-impact areas and implement targeted interventions, such as reducing emissions in transportation or improving manufacturing efficiency. It also enhances accountability, as stakeholders gain access to verified information on sustainability performance.

Collaboration is another essential aspect of digital ecosystems. Organizations can solve problems collectively and innovate by operating within a shared digital environment. For example, suppliers and manufacturers can collaborate to develop eco-friendly materials or redesign packaging to reduce waste. Logistics providers can coordinate shared transportation networks to minimize empty runs and maximize load capacity. Such collaborative efforts are difficult to achieve in fragmented supply chains but become feasible within integrated digital ecosystems.

Digital ecosystems also facilitate the adoption of circular economy principles within global supply chains. Digital tracking and reverse logistics systems enable the recovery, refurbishment, or recycling of products at the end of their lifecycle. Platforms can balance the supply and demand of secondary materials, thereby reducing reliance on virgin resources. This approach not only conserves natural resources but also creates new revenue streams and sustainable business models.

The role of data governance is crucial in ensuring the effectiveness of digital ecosystems. As the volume of generated and shared data grows, issues of data privacy, security, and ownership become more complex. Robust governance frameworks are required to build trust among stakeholders and ensure compliance with international standards. Clear data policies and strong digital security infrastructures are essential to maintain the integrity and reliability of the ecosystem.

Small and medium-sized enterprises (SMEs) can benefit significantly from participation in digital ecosystems. Traditionally constrained by limited resources and access to information, SMEs can leverage shared digital platforms to gain visibility in global markets and integrate into larger supply chains. This inclusivity enhances supply chain resilience and sustainability by diversifying the supplier base and reducing dependence on a few key players.

Sustainable supply chains are defined by their ability to withstand shocks, and this resilience is strengthened by digital ecosystems, which enable rapid adaptation. Disruptions caused by natural disasters, geopolitical conflicts, or pandemics can be mitigated through real-time data sharing and coordinated responses. Digital twins—virtual replicas of supply chain systems—allow organizations to simulate scenarios and develop contingency plans, further enhancing resilience.

The evolution of digital ecosystems is also driven by changing consumer expectations. Consumers are increasingly demanding transparency regarding the environmental and social impact of the products they purchase. Digital ecosystems enable companies to provide detailed information, such as carbon footprints and sourcing practices, there-

by building trust and brand loyalty. This consumer-driven demand encourages organizations to adopt more responsible practices.

Sustainable supply chains are further supported by the integration of financial technologies within digital ecosystems. Digital payment systems, supply chain financing platforms, and smart contracts streamline financial transactions and reduce administrative costs. These innovations also enable sustainability-linked financing, where organizations meeting environmental or social criteria are offered favorable financial terms.

Policies and regulations play a critical role in shaping digital ecosystems for sustainable supply chains. Governments and international organizations are increasingly promoting digitization and sustainability through incentives, standards, and regulations. International policy harmonization is essential to facilitate seamless data sharing and ensure consistent implementation of sustainability standards across supply chains.

Despite their potential, digital ecosystems face several challenges that must be addressed to realize their full benefits. These include technological disparities across regions, organizational resistance to change, and the high initial costs of digital transformation. Overcoming these barriers requires strategic investment, capacity building, and a cultural shift toward

collaboration and innovation. Ethical considerations are also central to the development of digital ecosystems. Issues such as data misuse, algorithmic bias, and digital exclusion must be carefully managed to ensure that the benefits of digitalization are equitably distributed. Organizations should adopt ethical frameworks that prioritize fairness, inclusivity, and transparency in digital operations.

Looking ahead, the evolution of digital ecosystems will likely be driven by continued technological advancement and growing stakeholder expectations. Emerging technologies such as quantum computing and advanced robotics have the potential to further enhance efficiency and sustainability in global supply chains. As these ecosystems mature, they will play a critical role in achieving global sustainability goals, including climate action, responsible consumption, and sustainable production. ■



collaboration and innovation.

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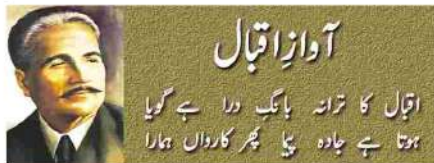
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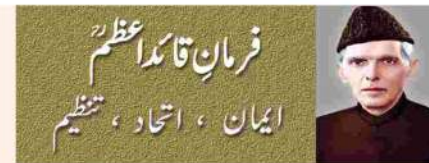
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Why Pakistan Must Manufacture Electrical Components Locally

Pakistan can't build a competitive power sector while importing most of its core components.

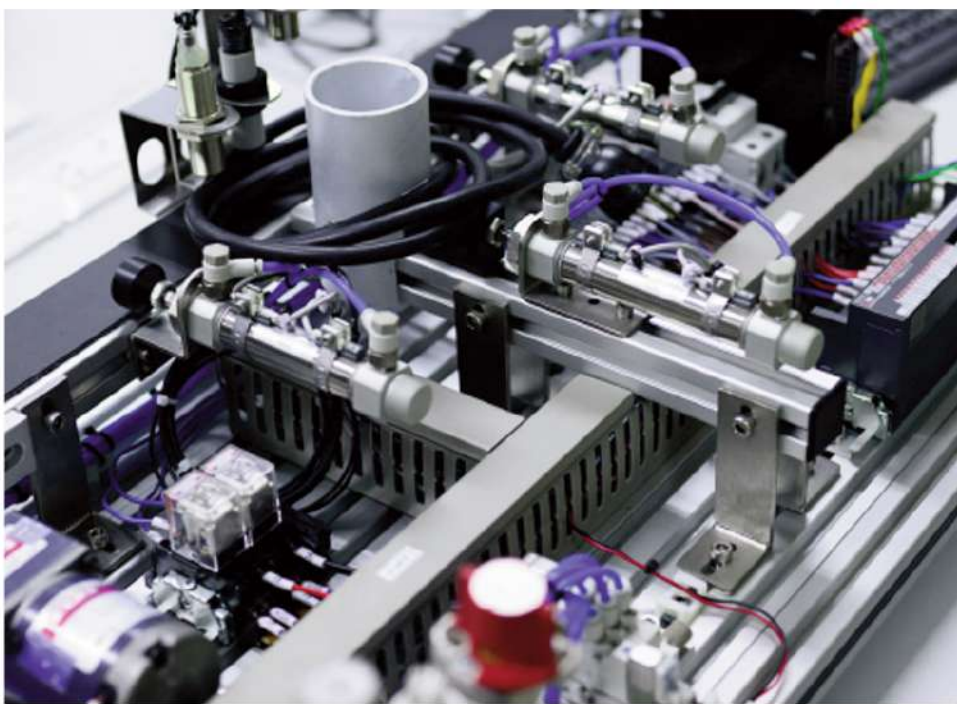
Local manufacturing of electrical equipment isn't just an industrial ambition; it's a practical necessity for cost control, energy security, and long-term economic stability.

First, import dependence makes the entire power value chain vulnerable. Transformers, switchgear, cables, meters, and protection systems are often sourced from abroad, exposing utilities and industries to exchange rate volatility, shipping delays, and geopolitical disruptions. When the rupee weakens, project costs rise instantly. Local production cushions these shocks and ensures continuity in critical infrastructure projects.

Second, manufacturing at home reduces costs over time. While initial setup requires investment, localized production cuts freight, duties, and inventory costs. It also allows customization to Pakistan's grid conditions such as temperature, dust, voltage fluctuations

improving durability and lowering lifecycle costs. Cheaper, more reliable components ultimately mean more affordable electricity for consumers.

Third, it creates jobs and builds technical capacity. Electrical manufacturing is not just assembly; it spans design, materials engineering, testing, and



after-sales services. Developing this ecosystem generates skilled employment for engineers, technicians, and vocational workers. It also strengthens linkages with universities and training institutes, helping align education with industry needs.

Fourth, local manufacturing supports export potential. Pak-

istan already has pockets of capability in cables, transformers, and low-voltage equipment. With the right quality standards and certifications, these products can access regional markets in South Asia, the Middle East, and Africa. Export-led growth diversifies revenue and improves the trade balance.

Fifth, it enhances innovation and technology transfer. When foreign firms partner with local manufacturers—through joint ventures or licensing—knowledge is absorbed domestically. Over time, this builds indigenous design capability, enabling Pakistan to move up the value chain from assembly to engi-

neering and R&D.

Sixth, it improves maintenance and service. Locally made equipment ensures quicker availability of spare parts and technical support. This reduces downtime in power plants, grids, and industrial units—an important factor in a country where outages carry high economic costs.

However, local manufacturing won't happen automatically. It requires consistent policy: stable tariffs, targeted incentives, access to finance, and strict quality enforcement to prevent substandard products. Public procurement should prioritize compliant local content without compromising standards. Equally important is a predictable regulatory environment to attract long-term investment.

With a market of over 250 million

people and rising energy demand, Pakistan has the scale to sustain a domestic electrical manufacturing base. Shifting from import dependence to local production is not just about industry, it's about resilience, affordability, and control over the country's energy future. - Engineering Review

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Tawakkal (Trusting Allah)

By Muhammad Tariq Haq | www.eslpk.com

Let the camel be first tied
Then Allah be trusted and relied

Like the birds which, at twilight, fly back satisfied
Our provisions will, likewise, be supplied

One robin was by another inquired
Why is man so uptight?

He, perhaps, does not find a God by his side
The other one replied

He has always sufficed
For those who have relied on their Lord despite no ray of light

Winners strive all their life
And continue to fight with all their might

Hajra ran seven times for a son who cried
Before miracle of "holy water" transpired

Maryam shook the tree by the lakeside
The dates dropped by her side when blessed with a holy child

Patience of Ayub was fully tested and tried
Before he overcame his long plight

Prophet Ibrahim defied those who conspired
The fire turned into a garden of delight

"For me Allah will suffice", he continued to recite
Besides, "He is the best who sets things right"

Prophet Muhammad in badar did alike
In uhud, too, when the believers reorganised after a brief respite

Prophet Moses was advised to strike by the riverside
Before the passages in the sea were assigned for every tribe

Strive with a life upright
Otherwise, even pharaoh and his allies were destroyed

When our Lord decrees and decides,
He only chooses the best, that is for us right

We must truly strive,
Eventually with His will we must be satisfied

When we decide, only on Allah, we must rely
He will never leave us "high and dry"

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NUST کی کمپیوٹر سائنس میں عالمی درجہ 50 درجے بہتر

انجینئرنگ اینڈ ٹیکنالوجی کے شعبے میں پاکستان میں اپنی پہلی پوزیشن برقرار رکھی
سوشل سائنسز اینڈ مینجمنٹ میں عالمی درجہ بندی 361 سے بہتر کر کے 335 کر لی

پاکستان کی ممتاز ترین جامعہ نیشنل یونیورسٹی آف سائنسز اینڈ ٹیکنالوجی (نسٹ) نے QS ورلڈ یونیورسٹی ریننگز ہائے سبجیکٹ 2026 میں نمایاں پیش رفت کی ہے جو اس کے تعویٰ تعلیمی معیار اور عالمی مسابقت کے عزم کی عکاسی کرتی ہے، رواں سال کمپیوٹر سائنس کے شعبے میں نسٹ نے 2025 میں 114 ویں پوزیشن سے 2026 میں 114 ویں پوزیشن تک پہنچتے ہوئے عالمی سطح پر 50

درجے بہتری حاصل کی، جامعہ نے انجینئرنگ اینڈ ٹیکنالوجی کے شعبے میں پاکستان میں اپنی پہلی پوزیشن برقرار رکھی ہے، نسٹ انجینئرنگ اور کمپیوٹرنگ کے شعبوں میں دنیا بھر میں 150 تا 200 کے درمیان درجہ بندی حاصل کرنے میں کامیاب رہا جبکہ مختلف مضامین میں 300 تا 350 کے درمیان اپنی مستقل موجودگی برقرار رکھی۔



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ٹرانسپورٹ و معیشت کو خطرات، الیکٹرک گاڑیوں اور ریل کے فروغ کی ضرورت، بحران کو سامنے رکھتے ہوئے

پاکستان 5 سالہ جامع حکمت عملی اختیار کرے، ماہرین

مشرق وسطیٰ میں توانائی کے بنیادی ڈھانچے کو شدید نقصانات کے بعد عالمی تیل و گیس مارکیٹ کے استحکام پر غیر یقینی صورتحال برقرار ہے، تاہم یہ بات واضح ہو چکی ہے کہ دنیا، خصوصاً وہ ممالک جو توانائی کی درآمدات پر

سے بڑھ کر 25 فیصد سے زائد ہو چکا ہے، جو بڑی کامیابی سمجھی جا رہی ہے، دوسری جانب پٹرول اور ڈیزل کی قلت نے ٹرانسپورٹ کے شعبے کو شدید متاثر کیا، اگر بحران مزید طویل ہوتا تو معیشت، زرعی پیداوار اور غذائی تحفظ کو سنگین

نیوالے 75 سے 80 فیصد تیل کا ذمہ دار ہے، جس کی مالیت تقریباً 20 ارب ڈالر سالانہ ہے۔ ماہرین کا کہنا ہے کہ الیکٹرک گاڑیوں کا فروغ ناگزیر ہے، ریلوے نظام کی بحالی اور برقی کاری کو بھی ترجیح دینے کی ضرورت ہے،



انحصار کرتے ہیں، اب پرانے نظام کی طرف واپس نہیں جاسکیں گے، متبادل توانائی ذرائع کی تلاش تیز ہو چکی ہے، اس سلسلے میں پاکستان کی حالیہ پیش رفت قابل ذکر ہے۔

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بھارت میں ریلوے نیٹ ورک کا 99 فیصد حصہ برقی بنایا جا چکا ہے، جس سے ایندھن کی درآمدات میں نمایاں کمی آئی ہے۔

ماہرین نے یہ بھی تجویز دی ہے کہ پاکستان ان تھنول ملاوٹ کو فوری طور پر نافذ کرے، جس سے تیل درآمدات میں کمی لائی

خطرات لاحق ہو سکتے تھے۔

اعداد و شمار کے مطابق پاکستان کے مجموعی درآمدی بل کا تقریباً ایک تہائی حصہ پٹرولیم مصنوعات پر مشتمل ہے، جو بیرونی ادائیگیوں کے توازن پر سب سے بڑا دباؤ ہے، خاص طور پر ٹرانسپورٹ کا شعبہ ملک میں استعمال ہو

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پابندی کو تحصیل سطح پر سب کیمپسز کے قیام اور آپریشن کا نام دیا گیا، زمین کا حصول، داخلے، تدریس اور فعالیت نہ کی جائے

ایچ ای سی چیئرمین اعلیٰ تعلیمی کمیشن نے سرکاری جامعات کے وائس چانسلرز/ریکٹرز کو خط کے ذریعے آگاہ کر دیا، اطلاق فوری طور پر ہوگا

اعلیٰ تعلیمی کمیشن آف پاکستان نے سندھ سمیت پورے ملک میں یونیورسٹی کے اضافی معنی کیمپسز کے قیام اور فعالیت پر پابندی عائد کر دی ہے، جس کا اطلاق فوری طور پر ہوگا اس پابندی کو تحصیل سطح پر یونیورسٹی سب کیمپسز کے قیام اور آپریشن پر پابندی کا نام دیا گیا اور کہا گیا ہے کہ ایسے کیمپسز کیلئے زمین کا حصول، تعمیرات، داخلے، تدریس اور فعالیت نہ کی جائے۔ چیئرمین اعلیٰ تعلیمی کمیشن آف پاکستان پروفیسر ڈاکٹر نیاز احمد نے ملک بھر کی سرکاری جامعات کے وائس چانسلرز/ریکٹرز کو ایک خط کے ذریعے آگاہ کر دیا ہے۔

15 اپریل کو جاری خط میں وائس چانسلرز کو مخاطب کرتے ہوئے کہا گیا ہے کہ ہائیر ایجوکیشن کمیشن آرڈیننس 2002 کے تحت اپنے قانونی اختیار کو استعمال کرتے ہوئے تحصیل کی سطح پر قائم یا کسی مجوزہ سب کیمپسز کی اب اجازت نہیں ہوگی، یہ فیصلہ ان کیمپسز اور ان کی ذیلی تعلیمی استعداد، انتظامی صلاحیت کے تفصیلی جائزے کے

بعد کیا گیا، کیونکہ ان کیمپسز کے معائنے سے یہ بات سامنے آئی ہے کہ تحصیل کی سطح کے سب کیمپسز عموماً اسٹرکچر میں کمزور اور تعلیمی بنیادوں نا پائیدار ہوتے ہیں، ایسے کیمپسز کو پی ایچ ڈی اساتذہ کی تقرریوں اور انہیں جاری رکھنے میں مشکلات رہتی ہیں، یہاں طلبہ کی تعداد محدود اور ڈگری پروگرامز کی افادیت محدود ہوتی ہے، جبکہ معیاری اعلیٰ تعلیم کیلئے درکار تجربہ گاہوں، ٹیکنیکی، رہائشی اور تعلیمی سہولیات کا فقدان ہوتا ہے، اعلیٰ تعلیمی کمیشن آف پاکستان ایسے کسی کیمپس کیلئے این او ای، منظوری، بیکریڈی کمیشن یا اسناد کی توثیق نہیں کرے گا۔

خط میں مزید کہا گیا ہے کہ کسی بھی قسم کی منظوری، نوٹیفکیشن، جامعات کی سٹڈی کیٹ یا سینٹیٹ کا فیصلہ یا انتظامی حکم اگر ایچ ای سی کی پیشگی منظوری کے بغیر سامنے آتا تو یہ اقدام ریگولیٹری مقاصد کیلئے کاعدم تصور ہوگا اور اس کی کوئی تعلیمی حیثیت نہیں ہوگی۔



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ENGINEERING REVIEW

Science & Technology

Handle with care: Soft robot gripper picks ripe fruit without bruising

When assessing the ripeness of fruit, sight and smell can tell you a lot, but the best indicator is often how the fruit feels.

Cornell researchers used stretchable fiber-optic sensors to create a soft robot gripper that can predict the

that are difficult to cultivate.

The research is published in Nature Communications. The lead author is former postdoctoral researcher Anand Mishra.

Shepherd's Organic Robotics Lab previously demonstrated the potential of stretchable fiber-optic sensors to give soft robotic systems the ability to feel the same dynamic, tactile sensations that enable

professor of horticulture and global development in the College of Agriculture and Life Sciences, who specializes in developing sustainable production methods for berry crops.

In order to train and test their gripper, they needed a model fruit. And for that, they turned to the strawberry.

"You can accurately tell when strawberries are ripe

two different fiber-optic sensors, one to measure the curvature of the finger, and the other to measure the pressure at the fingertip. This way, the robot can estimate the shape of an object and adjust its grip accordingly to grasp the ripe fruit without bruising it.

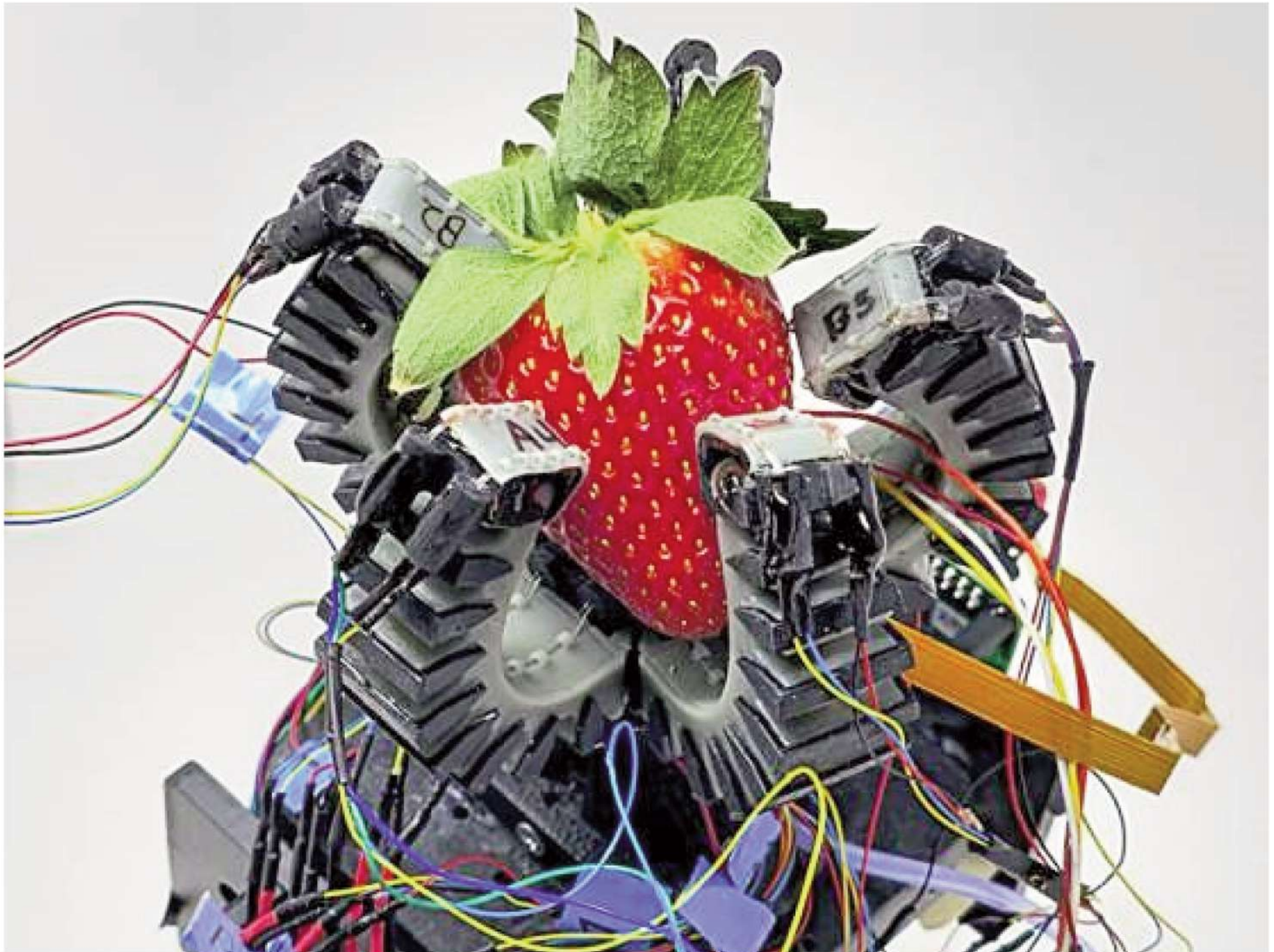
"The fiber-optic strain gauges have the same mechanical properties as the grippers that are using them.

For cases in which touch isn't enough, the researchers installed a camera in the gripper's palm to find fruit that are occluded by leaves or other vegetation. However, the device will be particularly handy when ripeness can't be detected visually, such as for avocados, pineapples or—Shepherd's favorite—pawpaws.

"The problem with pawpaws is you can't see when

on sustainable farming practices.

"Robots will allow us to do things we cannot do economically right now. We have row crops because row crops fit our machines. But if we have a larger number of smaller robots, we can have mixed cropping of different species that support each other," Shepherd said. "Instead of having soy one year and corn the next, you



ripeness of strawberries by touch, then gently twist them off their branch or vine without causing any damage.

The technology, developed in the lab of Rob Shepherd, the John F. Carr Professor of Mechanical Engineering in the Cornell Duffield College of Engineering, could lead to more resilient and ecological food production and increase the availability of fruit species

humans to navigate the natural world. In recent years, the team has expanded into agriculture, designing a soft robotic gripper that injects living plant leaves with sensors that help it detect and communicate with its environment.

To develop a way to evaluate and handle fruit with care, Shepherd's team partnered with Marvin Pritts,

by their color," Shepherd said. "So we could train our model to know if it's ripe based on touch, then validate our model by looking at the color. And Anand was able to accurately estimate whether it was the right time to pick strawberries based off of the stiffness he measured."

The soft robot gripper has an equally soft touch. The gripper is equipped with

So it's kind of like the flesh feels the fruit, rather than having separate sensors," Shepherd said.

The researchers also included a planetary gear mechanism so, once the fruit is grasped, the robot wrist can rotate and twist the strawberry off its vine, instead of pulling or plucking it, which can strain and damage the fruit.

they're ripe, and they ripen so fast that if you're not there at the right time, you just miss them," he said. "And you can't harvest and ship them, because they don't survive shipping very well, either. That's one reason we don't have pawpaws in grocery stores. But this can help with that."

The technology could have an even greater impact

can have them both. Or you could have interspersed species that are resistant to pestilence, that help block infestations and reduce the amount of pesticides and fertilizer. You can have drought resistance from canopy species.

"It's very complicated to manage a farm that way," he said, "and robots could allow us to do that." - TX

This 'gas battery' turns CO₂ and NO_x pollution into electricity while cleaning the air

A research team has introduced a new concept device termed the Gas Capture and Electricity Generator (GCEG), which produces electrical power as greenhouse gases are adsorbed from the atmosphere.

This innovation goes beyond conventional approaches that merely capture greenhouse gases, transforming them into a usable energy resource.

The team, which includes Professor Ji-Soo Jang from the Department of Nanoengineering, in collaboration with Professor Taekwang Yoon of Ajou University and Professor Hansel Kim of Chungbuk National University, published their work in the journal *Energy & Environmental Science*.

Amid growing global efforts to address climate change, carbon capture, utilization, and storage

(CCUS) technologies have gained attention. However, existing CCUS systems typically require substantial

the research team proposed a fundamentally new mechanism that directly converts the physicochemical energy

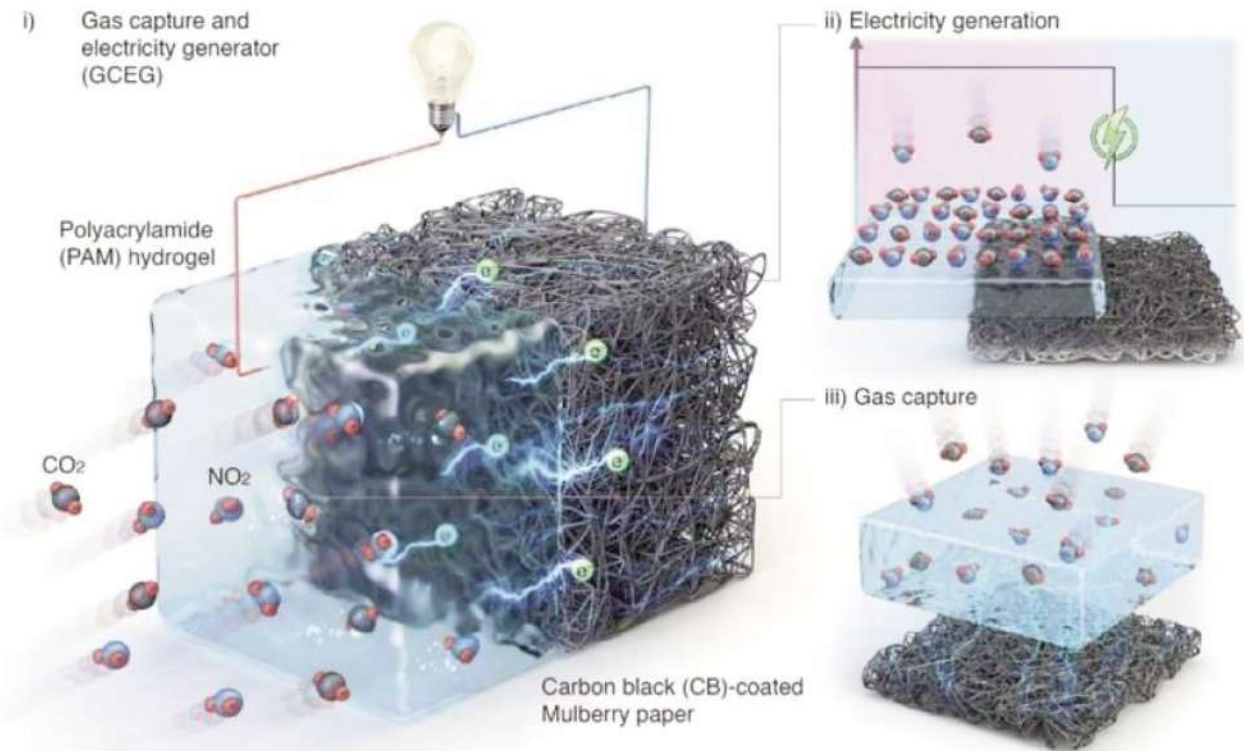
energy. The developed GCEG device consists of an asymmetric structure combining

such as nitrogen oxides (NO_x) or carbon dioxide (CO₂) are adsorbed, charge redistribution and ion

external power source. In essence, atmospheric pollutants act as the "fuel" for electricity generation, simultaneously purifying the environment while supplying energy.

This technology is expected to be widely applicable in self-powered smart environmental sensors, battery-free IoT systems, and industrial facilities where large volumes of emissions are generated. In such settings, it could enable simultaneous energy harvesting and carbon reduction. In particular, its integration into distributed energy systems is anticipated to accelerate the realization of carbon neutrality.

Professor Ji-Soo Jang stated, "This research demonstrates that greenhouse gases are not merely pollutants to be managed, but can serve as a new energy resource. We aim to further develop this technology into an environmental platform that not only achieves carbon neutrality but also generates energy." - TX



energy input for gas collection and processing. To overcome this limitation,

generated during gas adsorption on electrode surfaces into electrical

carbon-based electrodes with hydrogel materials. When greenhouse gases

migration occur within the device, enabling continuous direct current (DC) power generation without any

Researchers survey the challenges of integrating wind and solar into power grids

As wind and solar power expand rapidly worldwide, researchers are confronting a growing challenge: how to effectively integrate them into the power grid.

Wind turbines and solar panels have what economists call zero marginal cost, meaning producing additional units of electricity requires no fuel once installed. At the same time, this renewable energy varies greatly with the weather and can create operational challenges for grid operators.

A new review study from Georgia Tech examines how these characteristics are reshaping electricity markets and grid operations—and why addressing the challenge requires cross-disciplinary collaboration.

The study, published in *Renewable and Sustainable Energy Reviews*, synthesizes more than a decade of research. It analyzes more than 200 studies on the engineering, economic, and policy implications of managing renewable energy sources that are both intermittent and effectively zero-cost to operate.

"Wind and solar are now among the lowest-cost sources of electricity in many parts of the world, but

integrating them into the grid isn't simple," said Matthew Oliver, associate professor in the School of Economics and lead author of the study. "The wind doesn't always blow, and the

the demand side, and operators could simply ramp generation up or down. Now, we have variability on both supply and demand sides."

Analyzing the data Looking at the problem,

School of Public Policy; Santiago Grijalva, professor in the School of Electrical and Computer Engineering; and graduate student co-authors Maghfira Ramadhani (economics), Oliver Chap-

electricity market design, grid operations, and renewable technologies. They also explored the economic implications of large amounts of zero-marginal-cost electricity entering wholesale electricity

it harder for flexible conventional plants to earn enough revenue to stay available when renewable output falls.

Collaborating across disciplines

The team argues that successfully scaling renewable energy will depend on collaboration across traditionally separate fields.

"Engineering constraints affect how electricity markets work, markets influence investment decisions, and policy shapes how those investments happen," Oliver said. "When it comes to complex topics like this, you can't really treat engineering, economics, and policy as separate problems. They're all part of the same system."

The researchers found that electricity systems with high shares of renewable energy will require coordinated solutions that combine improved engineering practices, market reforms that value flexibility and reliability, and policies that align private investment with long-term decarbonization goals.

"Our hope is that this paper helps researchers across disciplines communicate more effectively," Oliver said. "If we want electricity systems with high levels of renewable energy to work reliably, then engineers, economists, and policymakers all have to understand how their decisions affect the others." ■



sun isn't always shining, so output can fluctuate significantly, which complicates grid management."

He added, "Historically, variation in electricity systems generally came from

Oliver knew he would need to be familiar with engineering concepts to get at the heart of the issue. He created a research team with Daniel Matisoff, professor in the Jimmy and Rosalynn Carter

man (public policy), and Amanda West (electrical and computer engineering).

Analyzing more than 200 studies published since 2010, the team mapped the complex interactions between

markets.

Because wind and solar have very low operating costs, they can lower prices in wholesale electricity markets. That benefits consumers, but it can also make