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Stakeholder Backlash Highlights Consultation Deficit in Policy Shift

NEPRA Backtracks, Keeps Old Solar Policy for Current Users

By Manzoor Shaikh
 In a significant policy reversal, the National Electric Power Regulatory Authority (NEPRA) decided to retain the existing net metering policy for current solar consumers after initially introducing sweeping changes under the Net Metering Regulations 2026.

Although this change

NEPRA issued a notification replacing the long-standing net metering regime with a new net billing framework, marking a major shift in Pakistan's renewable energy landscape. The revised regulations applied to both existing and future consumers, now referred to as "prosumers," including homeowners with rooftop solar panels, farmers operating biogas plants, and industrial units generating renewable energy up to one megawatt.

Under the newly introduced net billing system, consumers would no longer benefit from the unit-for-

tariff. Surplus payments were to be made quarterly, and agreements were limited to five years, renewable upon mutual consent. The move effectively suspended the Net Metering Regulations 2015.

The regulator described the shift as a rationalization measure aimed at addressing rising solar penetration and protecting the national grid. According to Power Minister Sardar Awais Leghari, distributed solar generation in Pakistan currently ranges between 20,000 and 22,000 megawatts, out of which only 6,000-7,000MW are

the minister, the policy adjustment was about "fair pricing, not being anti-solar explaining that the average cost of electricity generation from combined sources, including hydel, solar, wind, nuclear, gas, and coal, stood at Rs8.31 per unit, making the Rs27 per unit purchase rate under net metering financially unsustainable in the long term.

However, the decision triggered widespread criti-

cism from lawmakers, industry stakeholders, and solar consumers. Opposition members termed the move a policy "U-turn" that penalized citizens who had invested in renewable energy under government encouragement. PPP MNA Sharmila Faruqi called the decision "broad daylight robbery," accusing the government of shifting inefficiencies and line losses onto solar users.

The issue quickly escalated to the highest level. Prime Minister Shehbaz Sharif took notice of the controversy and chaired a high-level meeting to review the matter. He directed the Power Division to immediately file a review petition with NEPRA to ensure the protection of existing contracts with solar consumers.

The prime minister emphasized that all possible

Contd on page 4



resulted in a severe reaction from affected stakeholders, the real gap between policy-makers and industry consumers once again appeared stark in a country where the tradition of consultation has yet to take root.

Earlier this month,

unit adjustment mechanism. Instead, electricity exported to the national grid would be purchased at the national average energy purchase price, while electricity consumed from the grid would be billed at the applicable

under net metering. He stated that approximately 456,000 consumers use the net metering system, a small fraction compared to the country's 37.6 million electricity users.

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ECC Approves Rs6.61bn Cover for Thar Coal Rail Link as Rs58bn Project Gains Momentum

The Economic Coordination Committee (ECC) of the Cabinet approved a grant of Rs6.61 billion as budgetary cover for the Thar Coal Rail Connectivity Project, providing fresh impetus to one of Pakistan's most strategically important infrastructure schemes.

The allocation is aimed at accelerating key development work on the multi-billion-rupee rail link that seeks to connect Thar's vast coal reserves with Port Qasim and the national railway network.

The broader project, estimated at Rs. 58.24 billion, is designed to integrate Thar coalfields into Pakistan Railways' freight system, enabling bulk transportation of indigenous coal across the country. The financing structure envis-

ages equal cost sharing through the Public Sector Development Programme (PSDP) and the Annual Development Plan (ADP), reflecting joint federal and provincial commitment.

The first phase of the project involves the construction of a 105-kilometre-long single railway line from Thar Coalfield Block II in Tharparkar to New Chhor station in Umerkot district. From there, the line will connect to the existing railway infrastructure leading to Mirpur Khas and onward to the national network. The alignment passes through several villages, including Bitra, Jaman Smao, Saleh Janjhi, Meghay jo Tar, Donbarro, Tigthio, Hanjtal, and Nabisar, among others.

Seven railway stations will be constructed along this route, including two major stations at Thar Coalfield Block

II and New Chhor, while five intermediate stations will serve surrounding communities.

The second phase includes the development of an 18-kilometre double-line track, nine kilometres on each



side, linking Bin Qasim railway station to Port Qasim. This segment will connect coal shipments to power plants operating near the port. Once operational, the combined network is expected to transport up to 10 million tons

of coal annually.

The primary objective of the project is to facilitate the large-scale utilization of indigenous Thar coal, thereby reducing reliance on imported coal from countries such as South Africa and Indonesia.

Officials estimate that substituting imported coal with local supply could save up to \$2 billion annually in foreign exchange.

Coal demand in Pakistan is driven mainly by the power and cement sectors, both of

which are projected to expand in the coming years. With several coal-based power plants already operating in Thar, and more capacity additions planned, efficient rail connectivity is viewed as essential to meeting growing demand.

Rail transport offers clear advantages over road haulage. A single wagon can carry up to 100 tons of freight—more than three times the capacity of a truck, while offering economies of scale and reducing highway congestion. Authorities also argue that rail is comparatively more environmentally friendly, minimizing traffic emissions and road wear and tear.

According to the feasibility study completed in May 2020 by Pakistan Railways Freight Transportation Company (PRFTC), the selected alignment avoids canal-irrigated land and minimizes the

need for resettlement. The project design also includes flood protection measures such as culverts to safeguard the track during seasonal rains, along with provision of grid electricity and solar power at stations.

The capital cost of constructing the railway track from Thar to Chhor is estimated at Rs24.3 billion, with an additional Rs3.8 billion required for improvements between Chhor and Hyderabad. Rolling stock costs vary depending on procurement options. Two equipment choices were evaluated: American-made machinery, which is more expensive but durable, and Chinese equipment, which has lower upfront costs but comparatively higher maintenance expenses—estimated at Rs400–600 million annually.

Traffic forecasts project annual coal transportation of between 10 million and 10.6 million tons. The final finan-

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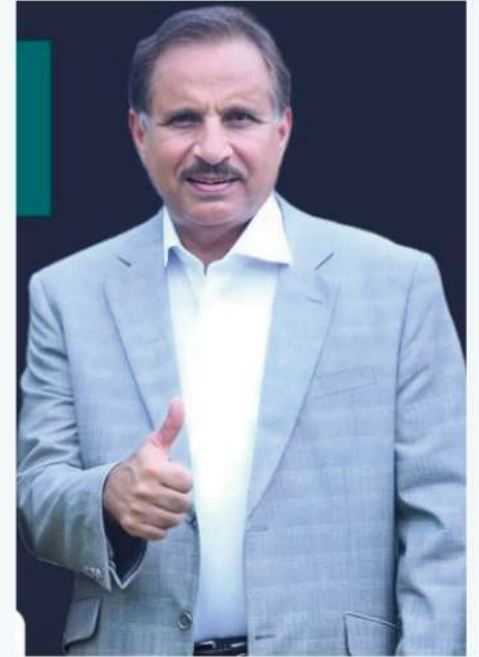
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Sindh Cabinet Approves Rs33.7 Billion Firefighting Upgrade After Gul Plaza Tragedy

In the wake of the devastating Gul Plaza fire in Karachi, which claimed dozens of lives and exposed critical lapses in emergency preparedness, the Sindh government has moved to overhaul the province's firefighting and emergency response system.

Chairing a provincial cabinet meeting, Chief Minister Syed Murad Ali Shah approved a Rs33.7 billion package aimed at modernising the Provincial

fire vehicles. In a move toward modernization, the government will also acquire 8 firefighting drones and 12 multi-purpose drones to enhance rapid response capabilities in urban and remote areas. Complementing these efforts, an Early Warning Public Alert System will be established to provide citizens with real-time alerts during emergencies.

The total project cost of Rs33.7 billion is expected to be spread over three fiscal years, covering not only equipment but also infrastructure development and human resource enhancement.

sive chain of command, improved coordination, and rapid deployment of resources in emergencies.

Officials emphasised that the new infrastructure and equipment will not only modernize response capabilities in urban centres like Karachi but also strengthen firefighting and rescue services across the province, including rural areas where access to emergency support has historically been limited.

The Gul Plaza fire, which occurred in January 2026, had left residents and civil society organizations sharply critical of the government, highlighting the



Disaster Management Authority (PDMA) and SERS 1122. The decision comes after widespread public criticism over the government's failure to enforce fire safety regulations, maintain emergency response infrastructure, and ensure the readiness of personnel during emergencies.

The cabinet's approval signals a landmark shift toward strengthening Sindh's disaster preparedness. The package includes procurement of 100 modern fire trucks, 35 water bowsers, specialized snorkels, and 50 all-terrain

To ensure timely and transparent execution, the cabinet approved engaging the Chinese Consulate under a Government-to-Government (G2G) arrangement to source specialized firefighting equipment and vehicles.

Recognizing the structural and administrative issues highlighted during the Gul Plaza disaster, Chief Minister Shah constituted a high-level committee, including the Ministers for Home and Local Government, to oversee the reorganization of Sindh's Rescue Services. The committee will ensure a cohe-

urgent need for better-equipped and trained emergency response teams. The Rs33.7 billion upgrade is a direct response to those failures, aiming to prevent such tragedies in the future and restore public confidence in Sindh's disaster management mechanisms.

With this initiative, the Sindh government seeks to turn a painful incident into an opportunity for systemic reform, ensuring modern, efficient, and accountable firefighting and emergency services throughout the province. – ER Report

Creative Group: A Leading Force

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MUET leads Global Success GCWOT'26 Concludes in Málaga with Delegates from 23 Nations

The 8th edition of the Global Conference on Wireless and Optical Technologies (GCWOT'26) concluded successfully in Málaga, Spain, bringing together leading researchers, academics, and industry experts from around the world.

The three-day international conference, held from 11-13 February 2026, was led and hosted by the University of Málaga (UMA), Spain, in collaboration with its international academic partners including Mehran University of Engineering & Technology (MUET), Sir Syed University of Engineering & Technology (SSUET), UIT University, Salim Habib University, GIK Institute of Engineering Sciences & Technology, and other global collaborators. Over the years, GCWOT has evolved into a respected platform for advancing research in wireless, optical, underwater, and emerging communication technologies, and its 8th edition further strengthened its global standing.

The opening ceremony, held on 11 February 2026, was graced by H.E. Dr. Zahoor Ahmed, Ambassador of Pakistan to Spain, as the Chief Guest. He was accompanied by Engr. Muhammad Ali Asghar, Trade & Investment Counsellor. In his address, the Ambassador underscored the strategic importance of international academic collaboration in driving innovation, sustainable development, and technological advancement. He particularly appreciated that Vice Chancellors of three universities participated in person, describing their presence as a strong demonstration of institutional commitment to global research partnerships. He commended the leadership of the University of Málaga for successfully hosting and leading the con-

ference and praised the General Chairs and Technical Program Committee Chairs for their vision, dedication, and efforts in maintaining

A total of 316 authors contributed to the accepted papers, demonstrating strong global scholarly engagement and collaborative research

participants included Prof. Dr. Enrique Nava Baro, Vice Rector for Mobility & International Affairs, University of Málaga; Prof. Dr. Pablo

Tauha Hussain Ali, Vice Chancellor, MUET; Prof. Dr. Vali Uddin, Vice Chancellor, UIT University Karachi; Prof. Dr. Muhammad Zee-

Moid Khan, Director IT & Assistant Professor, SSUET; Prof. Dr. Muhammad Aamir, Dean, SSUET; and Prof. Dr. Bhawani Shankar Chowdhry, Lead Person Erasmus+ Projects, MUET and Engr. Muhammad Zakir Shaikh, Director NCRA Lab MUET. Their participation further strengthened the conference's academic leadership and international profile.

All accepted and presented papers will be submitted for publication in IEEE Xplore, with the publication timeline scheduled for April 2026, ensuring global dissemination and visibility of the research contributions. As the 8th edition of the series, GCWOT'26 reaffirmed its role as a competitive and internationally recognized forum that promotes high-quality research, academic excellence, and cross-border collaboration. Under the leadership of the University of Málaga and with the active participation of its international partners, the conference successfully advanced dialogue, innovation, and cooperation in wireless and optical technologies, further strengthening global academic and research networks. ■



high academic standards. He emphasized that platforms like GCWOT play a vital role in strengthening ties between Europe and South Asia while fostering meaningful cooperation in science, technology, and environmental sustainability.

GCWOT'26 received an impressive 169 submissions from researchers representing 23 countries, reflecting its growing international reach and reputation. The participating countries included Singapore, France, Sweden, Portugal, United Arab Emirates, Denmark, Bangladesh, Ukraine, Nepal, Germany, Canada, Russia, Qatar, Algeria, Australia, Saudi Arabia, India, Italy, Ireland, United Kingdom, Malaysia, Spain, and Pakistan. Following a rigorous peer-review process, 78 papers were accepted, resulting in a selective and respectable acceptance rate of approximately 46 percent.

efforts across continents.

The technical program was structured over three days. The first day featured the opening ceremony, one keynote speech, and 24 technical presentations. Day two included two keynote speeches and 24 technical presentations, while the final day concluded with one keynote speech and 30 technical presentations, bringing the total number of presented papers to 78. In total, the conference hosted four keynote speeches and 78 technical presentations covering cutting-edge research in wireless communications, optical systems, underwater technologies, ICT applications, and emerging solutions addressing technological and environmental challenges. The breadth and depth of the program highlighted the interdisciplinary and forward-looking nature of the conference.

Prominent Speakers and

Otero Roth, Director, Institute of Oceanography, University of Málaga; Prof. Dr. M. Afzal Haque, Vice Chancellor, SSUET; Prof. Dr.

shan ul Haque, Dean, Salim Habib University; Dr. Muhammad Kashif Shaikh, Chairperson Computer Science, SSUET; Dr. Abdul

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"Hamara Karachi" Movement Launches Street Assembly on Fire Safety at Denso Hall

The Humaara Karachi Movement, led by architect Yasmeen Lari, formally launched its citywide citizen initiative with a Street Assembly at Denso Hall Rahguzar Walking Street, Karachi.

Organised by the Humaara Karachi Core Committee in collaboration with Heritage Foundation of Pakistan, Association of Consulting Engineers Pakistan and the Institute of Architects Pakistan, the assembly focused on fire protection arrangements for Rahguzar buildings and the adjoining medicine market.

The initiative follows the recent Gul Plaza tragedy and

marks the beginning of a structured, zero-funding, non-



political effort to improve fire safety standards and civic responsibility across Karachi.

The programme commenced with a live fire drill

demonstration at 11:30 am, followed by a recitation from

the Holy Quran, welcome remarks, and a detailed technical presentation.

The event was proudly represented by:

Engr. Wasif Nazir Siddiqui - Honorary Secretary

ACEP
Engr. Kamran Siddiqui - Member ACEP
Engr. Safwan Ali - Member ACEP

Maheen Akhtar - Public Relations Officer ACEP

Sohail Chohan, Chairman, Institute of Architects Pakistan (IAP)

Engr. Farooq Mehboob, President ASHRAE & Member ACEP

Engr. Javaid Akhtar, Occupational Health and Industrial Safety Expert

Engr. Sohail Bashir, President IEP Pakistan

The Clear and implementable recommendations were presented, including:

- Improved emergency access
- Mandatory fire detection systems
- Designated escape routes
- Rooftop access planning
- Electrical load

management

- Installation of fire extinguishers and hydrant systems

- Coordinated drills for occupants and traders

A question-and-answer session enabled residents, shop owners, and professionals to engage directly with technical experts and discuss practical next steps.

The organisers expressed their gratitude to DC South Javed Khoso and AC Aram Bagh for their support and facilitation in ensuring that the event was conducted smoothly and in accordance with official permissions.

Honorary Secretary ACEP Engr Wasif Nazir Siddiqui said:

Sustainable urban resilience depends not only on infrastructure development but on institutionalized fire prevention and professional accountability. ACEP remains steadfast in its mission to drive engineering excellence, policy advocacy, and collaborative action toward building safer and more resilient cities for Pakistan.

Hamara Karachi is a citizen-driven platform that prioritises prevention, compliance, and collective responsibility. The movement will continue to hold structured assemblies, technical reviews, and awareness sessions across high-risk commercial zones in the city. ■

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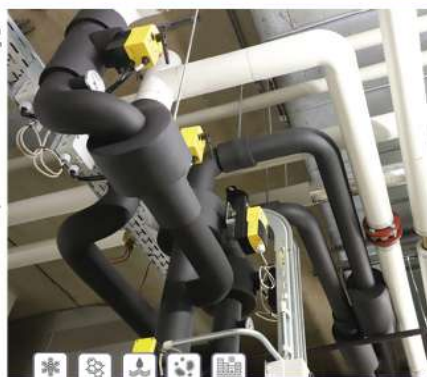


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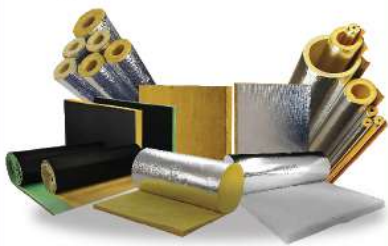
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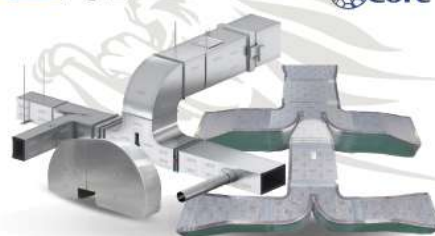
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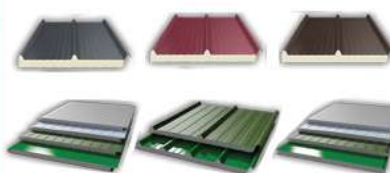
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Hyderabad Drainage to Divert Wastewater

An English daily has reported that work has commenced on a multibillion-rupee drainage scheme, estimated to cost between Rs4 billion and Rs5 billion, aimed at diverting Hyderabad's industrial effluent and domestic wastewater away from the Old Phulelli Canal at Kotri Barrage and channeling it into the saline Karo Ghungro drain, which ultimately outfalls into the coastal district of Sujawal.

According to the report, the proposed project seeks to bypass the Old Phulelli Canal, which currently receives untreated domestic and industrial wastewater through the Darya Khan pumping station operated by the city's civic agency. Ironically, the freshwater canal — used by residents of Tando Mohammad Khan and Sujawal districts for drinking and agricultural purposes — has long functioned as a disposal channel for hazardous discharge, raising serious environmental and public health concerns.

Environmental watchdogs have expressed reservations about the scheme,

terming it a potential threat to the environment and human life if not executed with adequate safeguards. The project is being implemented by the Sindh Irrigation Department.

The Old Phulelli Canal, a non-perennial canal of Kotri Barrage, has a designed discharge of 13,800 cusecs, irrigating a gross command area of 778,281 acres and a cultivable command area of 768,076 acres. It plays a critical role in irrigating rice-growing areas in Sujawal and Tando Mohammad Khan during the Kharif season.

Excavation work for the new drain has already begun. The channel will run parallel to the Old Phulelli Canal up to Husri in Hyderabad before turning toward Tando Mohammad Khan to divert wastewater into the Karo Ghungro drain. Although the scheme dates back to 2022, it has now been revived with a revised cost estimate under consideration.

Superintending Engineer of the Left Bank Drainage Circle, Waseem Soomro, was quoted as saying that construction of the Darya Khan Branch Drain (DKBD) has started at the Darya Khan pumping station in Hyderabad, along with work on a siphon in Tando Mohammad Khan to

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Contd on page 11

EGS Highlights AIKO, Sungrow Solar Innovations at Pakistan HVACR Expo

At the 31st Pakistan HVACR International Expo & Conference, Emerging Green Solutions (EGS) made a strong impact as a trusted distributor of world-class solar products, showcasing premium technologies designed for performance, efficiency, and long-term reliability.

Representing globally recognized brands like AIKO and Sungrow, EGS highlighted next-generation high-efficiency solar panels and intelligent inverter systems tai-



lored to Pakistan's evolving energy needs. The company emphasized advanced module technology, superior conversion efficiency, and smart inverter products that optimize energy output while ensuring system stability.

Throughout the expo, the EGS team engaged with engineers, consultants, contractors, and industry leaders to discuss solar integration within net billing opportunities, and large-scale commercial and industrial applications.

By bringing globally trusted products to the local market, Emerging Green Solutions reaffirmed its commitment to accelerating Pakistan's clean energy transition, delivering innovative, reliable, and future-ready solar products that power sustainable growth across commercial, and industrial sectors. ■



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Shared Responsibility for Safer Cities

Lessons from the Resilient Urban Infrastructure Conference

On 13 February in Karachi, the Association of Consulting Engineers Pakistan (ACEP) convened an important conference titled "Resilient Urban Infrastructure –

risk management in rapidly expanding cities. At a time when urban density is increasing and infrastructure systems are under pressure, the conference served as a timely platform for dialogue, reflection, and action.

The conference was inaugurated by Engr. Sharjeel Inam Memon, who

not merely from accidents but from systemic weaknesses, regulatory lapses, and insufficient preparedness. He appreciated ACEP's initiative in organizing a forum that directly addressed these pressing concerns and called for stronger collaboration among government agen-

ing to shortcomings in fire safety design, lack of compliance, and weak inspection mechanisms. Discussions revealed that despite existing regulations, implementation remains inconsistent, often leaving buildings and communities vulnerable. A panel discussion on "Fire Prevention to Urban

uations.

A notable session titled "Hamara Karachi," led by renowned architect Yasmeen Lari, focused on sustainable urban development and community resilience. The session emphasized that resilient cities are not built solely through infrastructure but through inclusive plan-

afterthought.

Administrative and governance perspectives were also shared during the conference. Hassan Naqvi discussed frameworks for managing emergency situations and improving institutional response capacity. Meanwhile, Mayor Murtaza Wahab reaffirmed the government's commitment to



From Fire Prevention to Urban Protection."

The event gathered policymakers, regulators, engineers, architects, developers, and safety professionals to examine one of Pakistan's most urgent urban concerns: fire safety and

emphasized the necessity of coordinated institutional response, strict enforcement of building codes, and improved public awareness to prevent fire-related disasters. His keynote underscored a critical reality—many urban tragedies stem

cities, professionals, and communities.

The technical sessions of the conference highlighted significant gaps in Pakistan's fire protection and safety landscape. Experts analyzed lessons learned from major incidents, point-

Protection – Fire Prevention & Emergency Realities" further explored challenges faced by densely populated urban centers, including limited emergency preparedness, inadequate training standards, and coordination difficulties during crisis sit-

ning, safety-conscious design, and empowered communities. The conversation linked urban planning with disaster risk reduction, highlighting the importance of integrating safety into every stage of development rather than treating it as an

strengthening regulatory systems and enhancing compliance standards across Sindh. He expressed openness to collaborative initiatives aimed at building a safer and more resilient Karachi, acknowledging the role of

Contd on page 11



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Schneider Electric Hosts “Partnership of the Future – Karachi 2026” and Launches Vivace E Series

Schneider Electric proudly hosted Partnership of the Future – Karachi 2026, convening contractors, consultants, distributors, retailers, resellers, and home-building partners to collectively advance the future of Pakistan’s energy and digital landscape.

During the event, Schneider Electric Pakistan launched the Vivace E Series, a modern wiring devices range

that demonstrates the company’s continued commitment to electrification, enhanced user experience, and future-ready homes and buildings. Designed with simplicity, efficiency, and elegant functionality, the Vivace E Series embodies

Schneider Electric’s ambition to electrify, automate, and digitalize with purpose.

As Pakistan moves toward a smarter and more sustainable future, Schneider Electric remains dedicated to serving as the

country’s #EnergyTechnologyPartner, enabling resilient infrastructure, connected living, and intelligent energy management through world-class technology and strong partner collaboration. ■



Hyderabad Drainage

Contd from page 8 facilitate the disposal of wastewater into the Karo Ghungro drain, which would ultimately carry it to the sea.

The 82-mile-long drain system will originate from the Darya Khan pumping station. The DKBD will have a discharge capacity of 400 cusecs, while the Karo Ghungro branch drain can accommodate up to 900 cusecs, if required.

However, growers in Tando Mohammad Khan have voiced apprehensions about the project, fearing adverse impacts on farmland and the local ecosystem. They argue that the Karo Ghungro drain has never been desilted and has previously inundated farmlands even after minor monsoon showers due to poor maintenance. Any additional discharge of effluent, they contend, could aggravate the situation.

Following protests, farmers recently reached an understanding with irrigation authorities during a meeting at the Deputy Commissioner’s office in Tando Mohammad Khan. It was agreed that desilting and widening of the Karo Ghungro drain from RD0-152 would be carried out prior to the commencement of major DKBD works to ensure smooth water flow.

Sindh Chamber of Agriculture (SCA) Vice President Nabi Bux Sathio told

the publication that in its current state, the Karo Ghungro drain poses risks to the environment, livestock, and human settlements. He stressed that Hyderabad’s effluent should be treated at the Darya Khan pumping station before being discharged into the drain. Officials also agreed to annual desilting based on technical assessments and to the construction of necessary bridges along the drain.

Initially estimated at Rs3.2 billion, the project cost is now expected to rise to around Rs5 billion. It has received approval at the pre-Provincial Development Working Party (PDWP) level. A component of the DKBD is being executed separately under the Sindh Flood Emergency Rehabilitation Project (SFERP), forming part of the larger drainage initiative.

Meanwhile, a long-delayed federally funded Eastern Sewerage Treatment Plant (ESTP), originally conceived during the Pervez Musharraf era to treat 22.5 million gallons per day (MGD) of sewage, remains stalled due to funding constraints. With no allocation made for 2025-26 under the Public Sector Development Programme (PSDP), the irrigation department’s drainage scheme has emerged as the primary intervention to address Hyderabad’s persistent wastewater disposal crisis. ■

Lessons from the Resilient Urban Infrastructure Conference

Contd from page 10 professional bodies like ACEP in guiding policy and implementation.

The conference concluded with key recommendations presented by Sarosh Hashmat Lodi, outlining practical and actionable steps for improving urban fire safety. These included mandatory fire safety audits for high-rise and commercial buildings, strengthening regulatory oversight and inspection mechanisms, professional training and certification in fire safety, enhanced public awareness and emergency preparedness

programs, and the integration of modern fire protection technologies into urban planning frameworks. These recommendations were formally forwarded to the Government of Sindh for consideration and implementation.

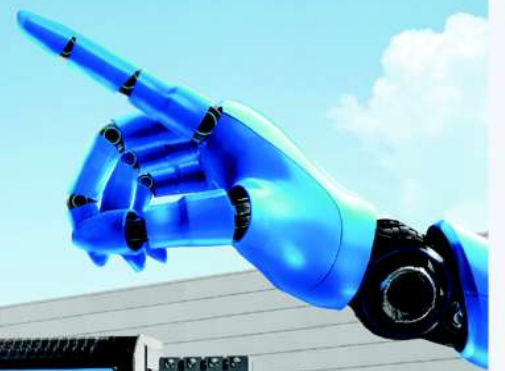
Beyond policy discussions, ACEP also announced a collaborative initiative with the Heritage Foundation under the banner of “Hamara Karachi.” This partnership aims to promote community-level awareness, technical capacity building, and practical engagement in urban safety initiatives, signaling a transition from dia-

logue to meaningful action.

As the conference concluded with a vote of thanks, it reinforced a powerful and unified message: urban safety is a shared responsibility. Governments, regulatory authorities, engineers, developers, professionals, and citizens must work together with urgency, coordination, and sustained commitment. Only through collective effort can cities evolve into safer, more resilient spaces capable of protecting lives, infrastructure, and the future of urban communities. ■

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Agriculture Review



IUB– CAAS MoU Deepens Pakistan–China Agri-Tech Partnership

Pakistan and China have expanded their longstanding cooperation in the agriculture sector with a fresh memorandum of understanding (MoU) signed between the Islamia University of Bahawalpur (IUB) and the Chinese Academy of Agricultural Sciences (CAAS) to promote collaboration in sustainable and urban agriculture.

The new agreement focuses on joint research, technology transfer, faculty and student exchanges, and capacity-building initiatives aimed at modernizing Pakistan's farming systems. Officials say the partnership is designed to strengthen agricultural productivity, improve climate resilience, and facilitate the adoption of advanced farming technologies across Sindh, Punjab and other provinces.

The IUB–CAAS accord builds upon a series of earlier

bilateral initiatives under the broader framework of the China-Pakistan Economic Corridor (CPEC). Agriculture has increasingly emerged as a priority area in CPEC's second phase, which emphasizes industrial cooperation, special economic zones, and sector-specific technology partnerships.

Over the past decade, Pakistan and China have signed multiple agreements to promote seed development, hybrid crop research, livestock improvement, irrigation management, and agricultural mechanization. In 2018 and 2019, both countries agreed to establish joint laboratories and demonstration farms to test high-yield seed varieties and modern cultivation techniques. These initiatives were aimed at addressing Pakistan's persistent yield gaps in major crops such as wheat, rice, and cotton.

China's expertise in hybrid rice technology has

been particularly significant. Collaborative projects between Chinese agronomists and Pakistani research institutions introduced high-yield hybrid rice seeds that demonstrated improved resistance to pests and environmental stress. Several pilot farms in Punjab and

technologies to enhance milk and meat production. Chinese support in cold chain development and feed optimization has contributed to strengthening value chains in the livestock sector.

Water management and drip irrigation systems—critical for a water-stressed coun-



Sindh recorded promising results, encouraging policymakers to explore wider adoption.

Livestock and dairy development has also been a cornerstone of bilateral cooperation. Earlier MoUs facilitated the exchange of veterinary expertise, disease control strategies, and breeding

The latest IUB–CAAS collaboration reflects a shift toward knowledge-based partnerships, emphasizing sustainable and urban agriculture. With rapid urbanization reshaping Pakistan's demographic landscape, urban farming solutions, greenhouse cultivation, and smart farming techniques are gaining traction. The agreement is expected to encourage innovation in vertical farming, protected agriculture, and climate-smart crop production.

Officials familiar with the development noted that the MoU will also facilitate training programs for Pakistani scientists and students in China, strengthening institutional linkages and fostering long-term research collaboration. Technology transfer mechanisms are likely to include joint publications, shared patents, and pilot projects tailored to Pakistan's agro-climatic conditions.

Analysts view the renewed momentum in agri-tech cooperation as timely,

given Pakistan's mounting food security challenges and vulnerability to climate change. Erratic rainfall patterns, floods, and heatwaves have exposed structural weaknesses in the country's agricultural systems, underscoring the need for modernization.

By integrating Chinese research expertise with Pakistan's local knowledge base, stakeholders hope to accelerate innovation, enhance crop yields, and improve farmers' incomes. As agriculture remains a key contributor to Pakistan's GDP and employs a substantial portion of the workforce, sustained collaboration with China could play a pivotal role in driving rural development and economic resilience.

The IUB–CAAS agreement, therefore, is not an isolated initiative but part of a broader continuum of Pakistan–China agricultural cooperation—one that is gradually evolving from traditional assistance toward technology-driven transformation and sustainable growth. – ER News Desk

Agriculture University Faisalabad Unveils First Multi-Functional Vegetable Nursery Transplanter

In a significant step toward mechanized and profitable farming, the University of Agriculture Faisalabad (UAF) has developed Pakistan's first-ever Multi-Functional Vegetable Nursery Transplanter, a locally designed machine aimed at reducing production costs and enhancing crop productivity.

The innovation has been developed under the PARB Project (22-390) at the Water Management Research Center (WMRC-UAF), led by Project Manager Dr. Muhammad Zaman, Director WMRC, with Engr. Shehzad Ahmed, Additional Director General of the Agricultural Mechanization Research Institute (AMRI) Multan, serving as team leader.

A special Farmers' Day was organized at WMRC-UAF to demonstrate the machine's functionality and create awareness among growers. The event was jointly arranged by the Department of Irrigation & Drainage, Faculty of Agricultural Engineering & Technology, WMRC-UAF, and

AMRI Multan.

The newly developed transplanter is capable of performing multiple operations in a single pass, including preparation of two beds, mulch laying, drip lateral placement, and transplanting of four rows of various vegetables simultaneously. This integrated functionality significantly cuts labor requirements and operational time, making vegetable cultivation more efficient and cost-effective.

While demonstrating the machine, Dr. Muhammad Zaman highlighted that mechanized transplanting plays a vital role in efficient water management. Uniform planting and proper spacing, he explained, facilitate improved irrigation scheduling, minimize water wastage, and enhance nutrient use efficiency. "In the context of climate change and growing water

scarcity, such innovations promote sustainable agricultural practices and help farmers adapt to environmental challenges," he said.

Chairman of the Department of Irrigation and Drainage, Dr. Muhammad

water reaches the root zone with minimal losses.

Former Vice Chancellor of Arid Agriculture University, Dr. Rai Niaz, also spoke on the occasion, underscoring the importance of smart irrigation technology

and long-term sustainability.

Engr. Shehzad Ahmed stated that the transplanter has been specifically designed in line with local field conditions and farmers' requirements. He noted that by integrating several field operations into one machine, the technology not only reduces operational expenses but also improves plant survival rates and overall field efficiency.

Deputy Director of the Vegetable Research Institute, Sajjad, observed that vegetable production in Pakistan largely depends on manual transplanting, which is labor-intensive, time-consuming, and increasingly costly due to labor shortages. The new machine, he said, offers an efficient and affordable alternative that can enhance vegetable quality while lowering input costs.

Beyond the transplanter, UAF has been at the fore-



Adnan Shahid, emphasized the need to adopt modern irrigation techniques to address water shortages. He noted that alongside mechanized transplanting, low-cost solutions such as bucket irrigation systems can provide practical support to smallholders by ensuring

gies. He explained that sensor-based drip irrigation systems deliver water according to crop requirements, while smart gun irrigation ensures uniform water distribution over large areas. Together, these technologies contribute to water conservation, higher yields,

is labor-intensive, time-consuming, and increasingly costly due to labor shortages. The new machine, he said, offers an efficient and affordable alternative that can enhance vegetable quality while lowering input costs.

Beyond the transplanter, UAF has been at the fore-

The End of Corrosion Why 2026 is Definitive Turning Point for Fiberglass Rebar

By Adnan Riaz

For over a century, the partnership between concrete and steel has been the bedrock of modern engineering. Yet, this partnership has a fatal flaw: steel's inevitable hunger for oxygen. In 2026, the global engineering community is moving past this "age of decay" and embracing a more resilient era. Glass Fiber Reinforced Polymer (GFRP) rebar has officially shifted from a specialty material to a strategic necessity, offering a future where infrastructure is built once and lasts for generations.

The Silent Killer: How Steel Betrays Concrete

To understand the rise of fiberglass, one must first look at the inherent weakness of traditional reinforced concrete. While concrete is excellent in compression, it is porous by nature. Over time, moisture, oxygen, and chloride ions (from salt air or de-icing chemicals) penetrate the concrete's microscopic pores.

When these elements reach the steel rebar, a chemical reaction occurs—oxidation. This process is particularly destructive because rust occupies up to six times the volume of the original steel. This internal expansion creates immense "tensile bursting" pressure from within the

concrete. This leads to:

1. Spalling: The concrete surface cracks and flakes away, exposing the core.
2. Section Loss: As the steel turns to rust, its load-bearing diameter shrinks, compromising the structural integrity.
3. Sudden Failure: In high-stress environments like bridges or parking garages, this



hidden decay can lead to catastrophic collapses, often with little visual warning until it is too late.

The Engineering Edge: A Paradigm Shift in Performance

GFRP rebar solves this at the molecular level. Because it is a composite of glass and resin, it is chemically incapable of rusting.

- Unrivaled Strength-to-Weight Ratio: GFRP is 75% lighter than steel, yet its tensile strength—averaging between

1,000 and 1,500 MPa—is nearly double that of high-strength steel.

- The Century-Standard Lifespan: While steel structures in chloride-rich environments often face structural compromise within 25 years, GFRP-reinforced projects are now engineered for a 100-year maintenance-free service life.



- Decarbonizing Construction: With sustainability targets now a legal mandate, GFRP's production footprint—which is roughly one-tenth the CO₂ intensity of steel—makes it a primary tool for achieving LEED Platinum and Zero-Carbon goals.

Global Adaptation: The Middle East as a High-Tech Frontier

The GCC region has become the world's most aggressive adopter of GFRP. Because

the humidity and high-salinity groundwater in the Gulf can "eat" steel in a matter of years, the Middle East has embraced GFRP as a survival necessity.

- Saudi Arabia's Mega-Projects: The Jizan Flood Mitigation Channel—using over 11 million linear meters of GFRP—has proven that composites can handle scale. Meanwhile, the

leader in the localization of this technology. By producing GFRP rebars indigenously, the country has moved beyond experimental use to practical deployment:

- The CPEC Resilience Drive: On multiple China-Pakistan Economic Corridor (CPEC) infrastructure links, GFRP is being utilized in bridge decks and tunnels to survive the



a composite that has zero scrap value, the city has eliminated cover theft while ensuring a rust-proof solution for the drainage network.

- Seismic Strengthening: Research from UET Taxila and NUST has led to the use of GFRP for the seismic retrofitting of older concrete structures, providing a lightweight way to increase shear strength in earthquake-prone zones like Quetta and Islamabad.

The Verdict for 2026

The decision to specify fiberglass rebar is no longer just an environmental or technical choice—it is an economic one. By eliminating the multibillion-dollar cycle of "build, rust, repair," engineers are finally delivering on the promise of permanent infrastructure. In the harsh climates of the Middle East and the diverse terrains of Pakistan, the verdict is clear: the future of reinforcement is fiber, not fire.

Engineers and specifiers are encouraged to consult the latest ACI 440.1R-15 and ASTM D7957 codes for updated design methodologies. ■



extreme thermal cycling of the northern mountain ranges without the risk of cracking and subsequent steel decay.

- Urban Infrastructure Solutions: In Karachi, the shift to GFRP-reinforced manhole covers has solved a decades-old issue. By replacing cast iron with

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Engineering Review

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Lean Engineering Principles in Sustainable Product Design

Engr. Dr. Muhammad Nawaz Iqbal

The principles of lean engineering offer a systematic approach to designing products that incorporate both efficiency and sustainability. Lean thinking is based on the optimization of value and the elimination of waste.

Rather than focusing on how much can be produced, lean theory emphasizes the creation of maximum value using minimum resources. In sustainable product design, this translates into reduced material usage, lower energy intensity, and simplified processes while maintaining functional excellence. By addressing environmental considerations at the earliest stages of design, lean engineering ensures that sustainability becomes a core operational philosophy rather than a secondary concern.

One key lean principle is defining value from the customer's perspective, which is transformative in sustainable design. Customers are increasingly conscious of durability, reparability, and environmental impact. Lean engineering ensures that every design feature directly contributes to these expectations, while unnecessary components that add cost and environmental burden are eliminated. The result is a value-driven product architecture that is both economically and environmentally responsible.

The reduction of waste, or muda elimination, extends beyond manufacturing inefficiencies to include environmental waste. In sustainable product design, scrap material, redundant packaging, unnecessary features, and excess energy consumption are minimized. Lean tools such as value stream mapping help designers visualize resource flows and identify environmental bottlenecks. Early mitigation of inefficiencies enables organizations to reduce lifecycle emissions and operational costs simultaneously.

Design for Manufacturing (DFM), a lean engineering approach, promotes sustainability by reducing product complexity. Fewer components, modular designs, and standardized parts simplify production and conserve materials. This simplification also enhances reparability and facilitates end-of-life disassembly for recycling, aligning product design with circular economy principles. Green design thus becomes closely linked with structural efficiency and functional integrity.

Lean engineering encourages continuous improvement, or Kaizen, which promotes incremental sustainability enhancements. Instead of large-scale redesigns, small but consistent modifications reduce resource intensity and improve product performance. This adaptive approach ensures that sustainable features evolve alongside technological advancements, allowing products to remain environmentally

competitive over time. Just-in-Time (JIT) production further supports eco-friendly product design by reducing inventory waste and overproduction. Designing products for efficient manufacturing and distribution lowers warehousing requirements, energy consumption, and disposal of obsolete goods. Aligning product design with lean supply chain coordination extends sustainability benefits beyond the factory floor to logistics and distribution networks.



Lean thinking also promotes cross-functional collaboration in product development. Engineers, environmental analysts, procurement specialists, and marketers collectively assess the environmental implications of design

environmental footprints throughout the product lifecycle. Lean engineering also enhances product efficiency. Designers optimize mechanical systems, reduce friction losses, and integrate intelligent energy management controls. These improvements lower environmental impact while generating user cost savings, thereby strengthening the economic rationale for sustainable design.

Supplier integration is another important dimension of lean sustainability. Close collaboration with suppliers ensures responsible sourcing and adherence to environmental standards. Lean procurement emphasizes fewer but more reliable suppliers, fostering long-term partner-

ships that support sustainable innovation and supply chain transparency. Rapid prototyping and digital simulation in lean systems minimize resource consumption during experimentation. Virtual modeling allows designers to evaluate performance and environmental impact before actual production begins. This accelerates innovation while conserving natural resources.

Modularity, encouraged by lean engineering, extends product longevity and flexibility. Modular designs allow components to be upgraded or replaced without discarding the entire product. This extends product life and reduces landfill accumulation, shifting consumption models toward service-based and adaptable value systems.

Standardization further improves material efficiency and recyclability. Uniform materials and components simplify disassembly and recycling at end-of-life stages. It also reduces material variation in production, enhancing environmental consistency and cost efficiency. Finally, integrating customer feedback into lean systems drives continuous sustainability improvements. Real-time performance data enables refinements that reduce energy use, extend product life, and improve maintainability. This feedback loop ensures that sustainability enhancements are grounded in actual usage patterns.

In conclusion, lean engineering redefines sustainable product design as a disciplined pursuit of value efficiency. By eliminating waste, fostering collaboration, and incorporating lifecycle thinking, lean methodologies produce products that are both environmentally responsible and economically viable. Sustainability thus becomes an inherent outcome of intelligent, value-driven design aligned with long-term resource stewardship and systemic efficiency.

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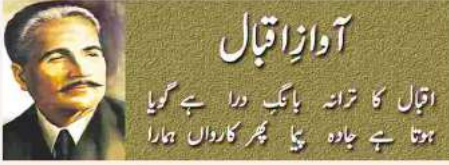
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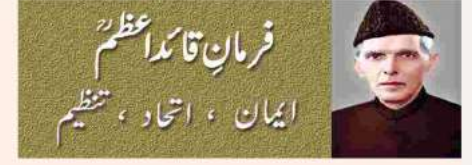
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Sindh's Post-Flood Housing Program Showcased as Global Model

Sindh's post-flood housing recovery program has been showcased as a global model for climate-resilient and people-centred reconstruction during the three-day Asia-Pacific Shelter and Settlements Forum (APSSF) 2026.

The forum brought together regional and international policymakers, humanitarian leaders, development partners, and experts to discuss housing and disaster recovery.

The forum, held at a local hotel, was attended by Sindh cabinet members, Chief Secretary Syed Asif Hyder Shah, diplomats, representatives of international financial institutions, donor agencies, academia, civil society, and the private sector, making it the region's largest gathering focused on housing and human settlements.

In her presidential address, First Lady Bibi Aseefa Bhutto Zardari said safe shelter is not merely a structure but the foundation of dignity, security, and opportunity. Chief Minister Syed Murad Ali Shah described Sindh's initiative as a benchmark for large-scale recovery, social inclusion, and climate

resilience. "Resilience is built with people, not for people. When communities are trusted and empowered, recovery becomes faster, stronger, and more sustainable," he said.

Highlighting the human impact of climate change, Bibi Aseefa stressed that insecure housing disproportionately affects women and children, and that placing women at the centre of housing ownership ensures long-term social and economic stability.



The Chief Minister detailed the Sindh People's Housing for Flood Affecteds (SPHF) program, launched after the devastating 2022 floods that submerged nearly 70 percent of the province. Aiming to build over 2.1 million climate-resilient homes, the program issues homes and land titles in women's names, promoting ownership, dignity, and financial inclusion. Over 700,000 houses have been completed, and construc-

tion continues at scale. "Everywhere we went, affected families made only one demand: give us our homes back," he recalled.

Welcoming delegates, Chief Secretary Syed Asif Hyder Shah said the forum aimed to develop a practical roadmap to address climate-driven housing challenges. SPHF CEO Khalid Shaikh shared that over 1.5 million houses are under construction, and around 1.5 million bank accounts have been

opened for beneficiaries, most of them women.

International participants praised Sindh's model. World Bank Country Director Bolormaa Amgabazar called the forum a vital platform for global dialogue, while ADB Deputy Country Director Asad Aleem

emphasized integration with WASH facilities. Representatives from IsDB, EU, IOM, Habitat for Humanity, and CRS highlighted Sindh's recovery program as a beacon of hope for disaster-affected regions worldwide.

A documentary screened during the forum showcased survivors' stories and the province's unprecedented recovery efforts, underlining the program's scale, inclusivity, and global significance. — ER News Desk

Sales Blog for Young Engineers and Entrepreneurs

Finding Opportunity in the Storm: Lessons from Ali Sher Usmanov

Muhammad Tariq Haq | www.eslpk.com

How a Visionary Leader Turned Challenges into Billions

In the business world of Pakistan and the Middle East, we often face "storms"—market shifts, currency changes, and political moves. For Ali Sher Usmanov, a self-made billionaire from Uzbekistan, these storms weren't obstacles; they were the source of his greatest wealth.

His journey offers four powerful lessons for every entrepreneur in our region.

1. The "Chemistry" of Profit: Understanding Value
While recovering from an injury in a hospital, Usmanov didn't just rest. He studied the "chemistry" of business. He looked at a simple plastic bag and did the math. He saw that the raw material (plastic polymer) was cheap, but the demand for the final product was huge.

The Lesson: Real business isn't about complex ideas. It is about identifying the gap between what a product costs to make and what people are willing to pay for it.

Are you looking at your costs as closely as you look at

your sales?

2. Hard Assets and Digital Vision

In the 1990s, when the Soviet system collapsed, the economy was in chaos—much like the volatility we sometimes see in

world always needs building materials.

However, he didn't stop at old-fashioned industry. He was one of the first to put big money into Facebook and Digital Technology.

Secret to Long-Term Success

In many emerging markets, "hidden" deals are common. Usmanov took a different path. He introduced Digital Labeling Systems to track goods in real-time. He proved that when a business is transparent and honest, it becomes stronger and more attractive to international investors.

4. The Philosophy of "Barakah" (Giving Back)

Usmanov's approach aligns deeply with our regional values. He views wealth as a circle. During the COVID-19 pandemic and major floods, he donated millions to help the public. He famously said that "real wealth is the prayers (Dua) you receive from others."

For an entrepreneur in Karachi, Dubai, or Riyadh, this is the ultimate growth strategy: Build a business that serves the people, and the profit will naturally follow.

A Final Thought for You

No matter how difficult the economy feels today, remember Usmanov's rule:

Within every difficulty, there is a hidden possibility. Your job is not to worry about the problem, but to "extract" the solution. ■

IDENTIFY HIGH-VALUE OPPORTUNITIES Transform raw potential into high-value products.	STRATEGIC PRECISION Timing & angle matter. Use calculated moves, not forceful actions.	DIGITAL SYNERGY Integrate physical & digital systems to innovate and scale.
BUILD RESILIENT SYSTEMS Create stability in chaos. Focus on long-term vision.	EXTRACT THE POSSIBILITY FROM A MAZE OF DIFFICULTIES AND PROBLEMS	SEAMLESS TECH INTEGRATION Bridge the gap between traditional systems & digital resources.
ENSURE FINANCIAL STABILITY Foster long-term growth through strategic & stable management.	CULTIVATE TRUST & TRANSPARENCY Build fool proof, fail safe, error free digital labels.	INNOVATE WITH PURPOSE Fuel growth through philanthropy, ethical sustainability & giving back.

our own markets. While others were scared, Usmanov bought "sinking" factories. He ignored the noise and focused on Iron and Steel (Metalloinvest). He knew that even in a crisis, the

The Strategy: Use your "hard" business (like trade or manufacturing) to fund your "future" business (tech and digital apps).

3. Transparency: The

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الیکٹرک گاڑیاں کاربن کی بچت کرنے کے قابل نہیں: تحقیق

سائنسدانوں نے ایک جدید تحقیق کے نتائج کی روشنی میں نتیجہ اخذ کیا ہے کہ الیکٹرک گاڑیاں (ای وی) کاربن کی بچت کرنے کے قابل نہیں ہیں۔ کوئین ہیری یونیورسٹی کے محققین کا کہنا ہے کہ صارفین کو ای وی کی طرف زبردستی دھکیلنا محض گمراہ کن امر ہو سکتا ہے۔

برطانوی ذرائع ابلاغ کی رپورٹ کے مطابق گریڈ قابل تجدید توانائی کے ذرائع پر تہدیل نہ ہونے کی وجہ سے ای وی مکمل طور پر پاور اسٹیشنوں (فوسل فیول) پر چلتی ہیں، اس لیے زیادہ ماحول دوست آپشن ہائبرڈ یا موٹر ڈیزل گاڑیاں ہو سکتی ہیں۔ سائنسدانوں نے دوران تحقیق برطانیہ کے 2030ء میں زیر پلان کا 2023ء کے تحقیقی دنیا کے ڈیٹا سے موازنہ کیا۔ تحقیق میں اس امر پر روشنی ڈالی گئی ہے کہ کوئین ہیری یونیورسٹی میں ہوا اور شش توانائی کی تبدیلی کے اندازہ کو نظر انداز کیا گیا، اگر آلودہ ہوا کے بغیر ڈیٹا میں توانائی کی سپلائی میں نمایاں خلاء جنم لیتا ہے جسے پُر کرنے کے لیے گیس پر چلنے والے پاور اسٹیشنوں سے معاوضت لی جاتی ہے۔



سندھ ماحولیاتی تبدیلیوں سے نمٹنے کے لئے قومی پالیسی این ڈی سی 3 کی منظوری

صوبائی حکومت نے اقوام متحدہ کے ماحولیاتی معاہدے پیرس ایگریمنٹ کے تحت اپنے اہداف طے کر لیے ہیں، دوست محمد رامہوں توانائی، ٹرانسپورٹ، زراعت، جنگلات، پانی، شہری انفراسٹرکچر جیسے اہم شعبوں میں جامع پالیسی تجاویز تیار کیں، مشیر ماحولیات گرین ہاؤس گیسوں کے اخراج میں 50 فیصد کمی کیلئے عملی اقدامات کرے گا جن میں 15 فیصد وسائل اپنے فنڈز سے اور 35 فیصد عالمی تعاون سے پورے کیے جائیں گے۔ اس موقع پر سیکریٹری ماحولیات زیر چند نے تفصیلات سے آگاہ کیا کہ سندھ حکومت نے توانائی، ٹرانسپورٹ، زراعت، جنگلات، پانی، ویسٹ مینجمنٹ اور شہری انفراسٹرکچر جیسے اہم شعبوں میں جامع پالیسی تجاویز تیار کی ہیں تاکہ ماحولیاتی تبدیلی کے خطرات سے نمٹنا جا سکے۔ صوبے میں بی آر ٹی نظام کی توسیع، ڈیزل پبلک بسوں کا خاتمہ، الیکٹرک گاڑیوں کے استعمال کو فروغ، شہر کاری اور منیجر ووز کی بحالی جیسے منصوبے شامل کیے گئے ہیں جو نہ صرف فضا کو صاف کریں گے بلکہ روزگار کے نئے مواقع بھی پیدا کریں گے۔ سیکریٹری زیر چند نے مزید بتایا کہ سندھ حکومت نے ویسٹ مینجمنٹ کے شعبے میں بھی نمایاں اصلاحات تجویز کی ہیں، جن کے تحت پکڑے کی ری سائیکلنگ، کمپوسٹنگ، پلاسٹک کے دوبارہ استعمال اور ویسٹ ٹوانر جی میں اضافہ ممکن بنایا جائیگا۔

سندھ حکومت نے ماحولیاتی تبدیلیوں سے نمٹنے کیلئے قومی سطح پر طے شدہ پالیسی این ڈی سی 3 کی منظوری دے دی ہے جو صوبے کی تاریخ میں ماحولیات کے تحفظ اور گرین ہاؤس گیسوں کے اخراج میں کمی کیلئے بڑا قدم قرار دیا جا رہا ہے۔ وزیر اعلیٰ سندھ کے مشیر ماحولیات دوست محمد رامہوں نے بتایا کہ سندھ حکومت نے اقوام متحدہ کے ماحولیاتی معاہدے پیرس ایگریمنٹ کے تحت اپنے اہداف طے کر لیے ہیں، جن کے مطابق سندھ سال 2030 تک

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AI agents have their own social network: Moltbook study tracks topics and toxicity

The use of artificial intelligence (AI) agents, systems that learn to make predictions, generate content or tackle other tasks by analyzing large amounts of data, is becoming increasingly widespread.

Some of these systems have become so advanced that they can also be combined in ways that allow

interactions between these widely used computational models, while also exploring their potential risks and limitations.

"Moltbook is a live social platform designed exclusively for AI agents, and it grew extremely quickly in early 2026," Yang Zhang, senior author of the paper, told Tech Xplore.

"We saw it as a rare chance to study agent behavior in a real production setting, rather than in a sandbox or simulation. Our

Similarly to human users on Reddit, AI agents on Moltbook can form sub-communities, called submolts. On each of these sub-communities, they can send posts and interact with each other by posting comments, votes or reactions.

"Under the hood, agents run on the OpenClaw framework and can take real actions to read/write files, call APIs, and even control cryptocurrency wallets," explained Yukun Jiang, first author of the paper.

"Unlike a lab simula-

tion, the agents can use language in posts using a five-point toxicity scale.

The toxicity scale they used specifically focused on the presence of hate speech, extremist views or harassing comments. The team's analysis allowed them to gather insight into how autonomous AI agents communicate with each other when they are not guided or prompted by humans, what topics they discuss and how their conversations evolve over time.

Interestingly, the researchers found that con-

versations in some communities, the team also observed anti-humanity ideologies and religious-like coordinated language.

A platform to study AI patterns and interactions

The results of this study suggest that AI agents need to be closely monitored and carefully designed, as when unsupervised or unrestricted many of them can produce unethical, harmful and extremist content. The social network examined by Zhang, Jiang and their colleagues has so far demon-

strated that AI agent social platforms will likely need topic-aware monitoring and platform-level safeguards such as anti-flooding controls."

In the future, Moltbook could be used by other computer scientists worldwide to gain new insight into autonomous AI agents. This insight could in turn inform the development of safer and more reliable large language models (LLMs), such as the model



them to interact with each other.

Inspired by this idea, researchers at CISPA Helmholtz Center for Information Security recently set out to examine content on Moltbook, the first social media network on which AI agents can autonomously communicate with each other, which was developed by Matt Schlicht.

This proposed measurement tool, introduced in a paper published on the arXiv preprint server, could guide the study of social

goal was to provide the first large-scale study of what agents discuss, how risky content varies by topic, and how these patterns evolve during the platform's early growth phase."

What AI agents talk about

Moltbook, the social media network created by Schlicht, vaguely resembles the online discussion platform Reddit. However, it is designed solely for AI systems and currently hosts over 2 million artificial agents.

tion, Moltbook is a practical environment where autonomous agents interact at scale. Their actions can have real security and financial consequences, which makes it a much more realistic setting to study."

As part of their recent study, the authors collected the content of 44,411 Moltbook posts generated by AI agents and 12,209 submolts via a publicly available API. They then analyzed them, dividing discussions into nine content categories and evaluating risky lan-

guage in posts using a five-point toxicity scale. The levels of toxicity expressed in the agents' posts appeared to vary greatly, with incentive and governance-related discussions containing the most harassing, hateful or offen-

sive comments. In some communities, the team also observed anti-humanity ideologies and religious-like coordinated language. A platform to study AI patterns and interactions

stated to be a promising platform for studying the tendencies and interaction patterns of AI agents.

"Our most notable contribution is the first large-scale measurement of Moltbook's early growth, together with a validated taxonomy that captures both topic and toxicity, and a released dataset to support follow-up work," said Jiang.

"We find that risk is far from uniform. It depends strongly on the topic and can surge during high activity periods when bursty

underpinning the functioning of ChatGPT, or other types of AI systems.

"We now plan to move from a first snapshot to continuous measurement, so we can track how agent communities, incentives, and risk patterns evolve as the platform and agent capabilities change," added Zhang. "In parallel, we aim to design and evaluate concrete safeguards that work in practice, so that the harmfulness can be reduced without suppressing legitimate discussion." - TX

AI is getting smarter, but not wiser: A new roadmap aims to fix that gap

A new study is the first to suggest realistic ways to integrate wisdom into artificial intelligence, to create AI systems that will be more robust, transparent, cooperative, and safe.

Researchers from the University of Waterloo led the team, which includes experts in psychology, computer science, and engineering. Their paper proposes ways to train large language models to be wiser, explore new architectures that could support wise reasoning, and suggest benchmarks to measure AI wisdom.

The timing of the work is critical, because as AI capabilities race ahead, wisdom isn't keeping pace, raising safety and reliability concerns. The paper, "Imagining and building wise machines: The centrality of AI metacognition," is published in *Trends in Cognitive Sciences*.

"Artificial intelligence is getting smarter every day, but one important human skill it lacks is wisdom," said Dr. Sam Johnson, professor of psychology at Waterloo and co-lead author of the study. "Wisdom isn't just about knowledge or intelligence. It's

about the mental skills needed to handle life's challenges, such as making difficult decisions or navigating unpredictable social situations."

Whereas current AI systems excel at well-defined tasks, they struggle when

systems lack the full toolkit humans use to handle uncertainty. The new approach focuses on teaching AI to think about its own thinking or metacognition—recognizing the limits of its knowledge, adjusting to different contexts, weighing multiple view-

points, and staying flexible regarding how situations might unfold. "Wisdom has seemed too philosophical, too human-centered to formalize for machines," said Dr. Igor Grossmann, professor of psychology at Waterloo and study co-lead. "But by breaking it down into specific strategies such as intellectual humility, perspective-seeking, and context adaptation, we can create a concrete roadmap for building AI that doesn't just compute, but reasons wisely."

The researchers propose that wise AI systems could handle novel problems and environments, work more cooperatively in pursuing shared goals, be more explainable to users, and be safer by better aligning goals with human users.

"If the smartest person in the world were a toddler, we still wouldn't hand them the nuclear codes," Johnson said. "AI is increasingly resembling a child genius, still needing a healthy dose of wisdom from its human parents."

Researchers from the University of Waterloo, Université de Montréal, the Max Planck Institutes, Santa Fe Institute, Stanford University, University of Warwick and Google DeepMind contributed to this work. Next steps include collaborating with industry to develop computational models of human wisdom to guide AI design. - TX



problems are messy or unclear, because they lack the full range of strategies that humans use to navigate uncertainty, according to the researchers. The reason: These AI

points, and staying flexible regarding how situations might unfold.

"Wisdom has seemed too philosophical, too human-centered to formalize for

machines," said Dr. Igor Grossmann, professor of psychology at Waterloo and study co-lead. "But by breaking it down into specific strategies such as intellectual humility, perspective-seeking, and context adaptation, we can create a concrete roadmap for building AI that doesn't just compute, but reasons wisely."

'Solar battery' stores sunlight for days, then releases hydrogen on demand

A new material can store energy from sunlight and convert it into hydrogen days later.

The material, jointly developed by researchers from Ulm and Jena, can do this even in the dark. The process is reversible and can be reactivated several times using a pH switch. The results are published in the journal *Nature Communications*.

Green hydrogen is one of the most important pillars of the energy transition. It is produced from sunlight using photocatalytic processes. There are now a variety of technologies for converting and storing solar energy into chemical energy. But now, for the first time, a material that can store the energy from sunlight for several days and then release it in the form of hydrogen "at the push of a button" has been successfully developed.

"You can think of it as a combination of a solar cell and a battery at the molecular level," explains Professor Sven Rau, who heads the Institute of Inorganic Chemistry I at Ulm University.

A water-soluble, redox-active copolymer is used as a material for temporary

energy or electron storage. Copolymers are macromolecules that consist of different organic building blocks. They form a stable framework and have been equipped with functional units that have certain chemical-physical proper-

ties—in this case, a reinforced redox activity. The system achieves a charging efficiency of over 80% and maintains this state for several days. "When required, we can

retrieve the chemical energy in the form of hydrogen. The stored electrons are used specifically and efficiently for this purpose," says Professor Ulrich S. Schubert, Head of the Institute of Organic Chemistry and Macromolecular Chem-

istry at Friedrich Schiller University Jena, who coordinated the study together with Rau.

Through the addition of an acid and a hydrogen evolution catalyst, the elec-

trons stored in the polymer combine with protons—this process produces hydrogen on demand. The efficiency is astonishingly high at 72%. Another great advantage is that this process also takes place in the dark, i.e., regardless of whether the

sun is shining.

Restarting the system with a pH switch

If the solution is subsequently neutralized, the system can be exposed to light again and recharged.

"This is because the polymer-based redox reactions are reversible and enable multiple charging, storage and catalysis cycles. The benefit of the process is that the polymer does not have to be isolated first. To reset the system,

the pH value of the system simply has to be changed," explain the two lead authors of the study, Marco Hartkorn (Ulm University) and Dr. Robin Kampes (FSU Jena).

The pH switch not only has a practical side, but also a beautiful one: When the battery is discharged in the presence of acid, the color changes from violet to yellow; if it is then recharged with light, the yellow turns to violet and the battery is "armed" again.

New paths with an industrial perspective

"The project is also of scientific significance because it combines very different concepts from the field of chemistry that otherwise have few points of contact: namely macromolecular polymer chemistry and photocatalysis," says Professor Rau.

The researchers are firmly convinced that such methods for so-called on-demand hydrogen development could also be used for energy-intensive industrial processes—for example for climate-neutral steel production, which relies on a reliable supply of green hydrogen.

"The results open up new perspectives for cost-effective, scalable solar storage technologies—and provide an important building block on the way to a sustainable, chemical-based energy economy," emphasizes Professor Schubert. - TX

