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Updated Feasibility Study Confirms 37-Year Mine Life

Reko Diq to Yield 13.1M Tonnes of Copper & 17.9M Ounces of Gold

Manzoor Shaikh

The updated feasibility study of the Reko Diq Project has found that the mine life spans over 37 years, with an expected production of 13.1 million tonnes of copper and 17.9 million ounces of gold, according to information shared by the Oil and Gas Development Company Limited (OGDCL) with the Pakistan Stock Exchange (PSX) and the London Stock Exchange (LSE).

The notices to the exchanges state that in Phase I, the project is planned to process 45 million tonnes of mill feed annually from 2028. By 2034, Phase II is expected to double the processing capacity to 90 million tonnes per annum (Mtpa).

The company announced last week that the updated feasibility study for the Reko Diq Project was complete, marking a significant milestone that would enable Pakistan to develop one of the world's largest undeveloped copper-gold resources.

In light of these developments, the OGDCL Board of Directors has approved an increase in the company's funding commitment to USD 627 million. The shareholder equity contributions by the company, after considering project financing, are expected to be USD 349 million, subject to adjustments for actual project financing costs and inflation.

Shareholding

The OGDCL holds an 8.33% share in the project as part of a collective 25% stake held by three Pakistani state-owned enterprises (SOEs), including Pakistan Petroleum Limited (PPL) and Government HIoldings (Private) Limited (GHPL).

The interest of SOEs is held through Pakistan Minerals (Private) Limited. Of the remaining shares, 25% is held by the Government of Balochistan, with 15% on a fully funded basis through Balochistan Mineral Resources Limited and 10% on a free-carried basis. The remaining 50% is held by Barrick Gold Corporation, which is the operator of the project.

Mine life

The updated feasibility study outlines a mine life of 37 years, divided into two phases, with Phase I requiring an estimated capital outlay of USD 5.6 billion, excluding financing costs and inflation. Phase II is planned to be funded through a limited-recourse project financing facility and is expected to commence operations in 2028. A limited-recourse project financing facility of up to USD 3 billion is being pursued, with the remaining funding to be covered through shareholder contributions. Negotiations for project financing are ongoing.

The project will leverage five of the currently identified 15 porphyry surface expressions within the *Contd on page 2*

Reko Diq to Yield 13.1M Tonnes of Copper & 17.9M Ounces of Gold

Contd from page 1

current mining lease, highlighting substantial future growth potential. Phase II is planned to be funded through a combination of revenue generated from the project, additional project financing, and shareholder contributions.

Outcome

Under the updated feasibility study, Phase I is planned to process 45 million tonnes of mill feed annually from 2028. By 2034, Phase II is expected to double the processing capacity to 90 Mtpa.

The company stated that, based on existing reserves, the Reko Diq project is expected to yield 13.1 million tonnes of copper and 17.9 million ounces of gold over the life of the mine (100% basis).

In response to these developments, the Board of Directors of OGDCL has approved an increase in the company's funding commitment to USD 627 million, inclusive of project financing costs, reflecting its proportional share of total capital investment. The increase considers the anticipated rise in copper and gold prices, which have helped offset higher project costs. The shareholder equity contributions by the company, after factoring in project financing, are expected to be USD 349 million, subject to adjustments for actual project financing costs and inflation.

Environmental Impact Assessment

The Environmental and Social Impact Assessment (ESIA) of the project has been conducted to evaluate the project's effects on the local environment, biodiversity, water resources, air quality, and socio-economic conditions. The EIA has been carried out in accordance with national and international environmental standards. The project has undergone a comprehensive Environmental and Social Impact Assessment (ESIA) to comply with Pakistan's environmental laws and global best practices.

BEPA's role

The Balochistan Environmental Protection Agency (BEPA) is responsible for approving environmental impact assessments in the province. The project submitted its EIA report and obtained the necessary approvals, following Pakistan's Environmental Protection Act, 1997, and the Balochistan Environmental Protection Act, 2012.

Several environmental and social studies have been conducted, including a Water Resource Management Study to assess groundwater and surface water impact, a Biodiversity Assessment to evaluate the effects on local wildlife and habitat, and an Air and Noise Pollution Study to monitor dust and emissions from mining activities. Additionally, a Tailings and Waste Management Plan has been designed to prevent soil and water contamination, while a Community Impact Study assesses the social and economic effects on local communities.

To ensure responsible mining, Barrick Gold has followed global environmental and social standards, including the International Finance Corporation (IFC) Performance Standards, the Equator Principles (EP4) for responsible mining investments, the International Cyanide Management Code for handling toxic chemicals, and compliance with the UN Sustainable Development Goals (SDGs).

Several mitigation and sustainability measures have been implemented, including the use of brackish water instead of fresh groundwater to prevent depletion of local water resources, a modern tailings storage facility (TSF) to safely manage mining waste and prevent contamination, and dust suppression systems and air quality monitoring to minimize environmental impact. Additionally, biodiversity conservation initiatives have been introduced to protect endangered species in the region, and local community engagement programs have been launched to promote job creation and social benefits.

Current Status of EIA Compliance

Barrick Gold received approval for its environmental management plan in 2023. The company continues to monitor environmental indicators and submit reports to the Balochistan EPA. Regular third-party audits ensure compliance with environmental and social regulations.■

KOLOJIC Ltd UK Brings Global Expertise to Pakistan, Bridging Research with Market Needs

Dr. Junaid Syed, founder of KOLOJIC Ltd UK, is a technology leader, professor, and entrepreneur.

A former faculty member at NUST and Principal Investigator at RIMMS, he moved to the UK in 2002, joining the industry and leading design teams across the UK, USA, and Asia for a major US company. He later headed CommScope's business in Asia, the Middle East, Africa, and Australia before establishing and leading a new global business for Rosenberger, a well-known German company.

With a career spanning over 30 years across Pakistan, the UK, the US, and China, Dr. Syed has been at the forefront of groundbreaking innovations, holding 27 international patents, including 14 US-issued patents. His expertise in global production, multinational corporations, and startups has made him a key figure in technology-driven business transformation.

KOLOJIC Ltd is the Entrepreneur in Residence at Edinburgh Napier University, assisting in the commercialization of university research. Dr. Syed is also a Visiting Professor at universities in the UK and China, actively leading R&D and startup operations.

His initiative in Pakistan aims to equip universities, startups, spinouts, SMEs, and local industries with the tools to turn research into market-ready products, develop strong product strategies, and align research with industry demands.

With a "From Concept to Business" approach, KOLOJIC Ltd will offer specialized training and consultancy programs to help Pakistani industry and academia compete in local and global markets. These transformative opportunities will be available in Pakistan soon.

For more details, contact: junaid.syed@kolojic.com ■

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CDWP Approves Key Development Projects as Water Sector Investments Gain Momentum

The Central Development Working Party (CDWP) has approved six major development projects, marking a significant step towards national infrastructure and economic growth.

Chaired by Minister for Planning, Development & Special Initiatives (PDSI) and Deputy Chairman of the Planning Commission, Ahsan Iqbal, the CDWP approved four projects worth Rs. 11.20 billion while recommending two projects worth Rs. 140.129 billion to the Executive Committee of the National Economic Council (ECNEC) for final approval.

The meeting, attended by Secretary Planning Awais Manzur Sumra, members of the Planning Commission, and representatives from federal ministries and provincial governments, focused on key areas such as higher education, tourism, and transport & communications.

Approved Projects in Higher Education

CDWP approved four higher education projects, including:

- Development of Infrastructure at LUAWMS (Phase-II) – Rs. 1.85 billion
- Establishment of National Center for Nanoscience and Nanotechnology (NCNN) – Rs. 2.77 billion
- Establishment of National Center for Manufacturing (NCM) – Rs. 4.28 billion
- Improvement of Academic Facilities at the University of Karachi – Rs. 2.29 billion

Tourism and Transport Projects Recommended to ECNEC

Two major projects have been referred to ECNEC for further evaluation:

- Khyber Pakhtunkhwa Integrated Tourism Development Project (KITE) – Rs. 27.30 billion (World Bank-funded)
- Khyber Pakhtunkhwa Rural Accessibility Project (KP-RAP) – Rs. 112.82 billion (93.81% funded by the World Bank, 6.19% by KP government)

The KITE project aims to enhance tourism infrastructure, road networks, visitor facilities, and private sector participation, contributing to economic growth, employment generation, and poverty reduction. Meanwhile, KP-RAP focuses on road and bridge rehabilitation across 23 districts, improving access to markets, schools, and healthcare facilities.

Massive Investment in Water Sector Under Consideration

In a parallel development, the Ministry of Water Resources has proposed 33 new water sector projects, amounting to Rs. 424.128 billion, for inclusion in the Public Sector Development Program (PSDP) 2025-26. However, none of these projects have been officially incorporated yet, as their PC-1 documents remain incomplete.

Key proposals include:

- Four projects by WAPDA – Rs. 33.02 billion
- Three projects in Sindh – Rs. 257.78 billion (Rs. 15.80 billion requested for FY 2025-26)
- 19 projects in Khyber Pakhtunkhwa – Rs. 94.13 billion (Rs. 14.24 billion requested)
- Seven projects in Punjab – Rs. 39.20 billion (Rs. 10.80 billion requested)

The Greater Karachi Bulk Water Supply Scheme (K-IV, Phase 1) also came under discussion. Originally budgeted at Rs. 126.4 billion, the project is now expected to cost Rs. 150 billion due to delays and cost escalations. The Sindh government's failure to award tenders for water distribution lines has further hindered progress.

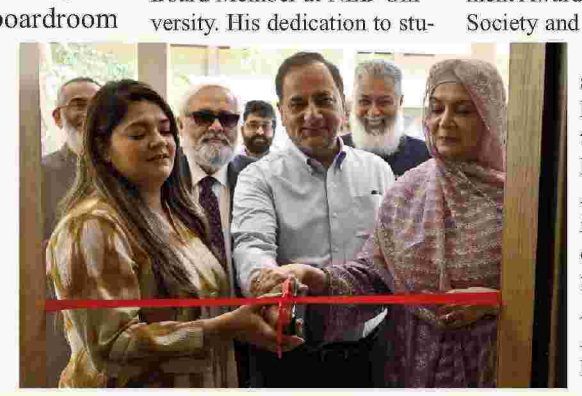
Government Calls for Accelerated Project Execution

Senator Shahadat Awan, Chairman of the Senate Standing Committee on Water Resources, emphasized prioritizing ongoing projects before initiating new ones to maximize public benefit. The committee also stressed the need for enhanced monitoring and auditing to ensure transparency in project execution.

These approvals and proposals highlight the government's strategic focus on education, infrastructure, and water security, aimed at boosting economic resilience and sustainable development across Pakistan. — PR

NED University Pays Tribute to Engr. M. Abbas Sajid with a Dedicated Boardroom

In a landmark recognition of engineering excellence, mentorship, and industry leadership, NED University of Engineering and Technology has officially designated a boardroom in the Department of Mechanical Engineering as the "Engr. M. Abbas Sajid Board Room." This prestigious honor, approved by the NED University Syndicate, underscores his unwavering commitment to education, research, and professional development.



A distinguished alumnus of NED University's 1983 Mechanical Engineering class, Engr. Muhammad Abbas Sajid has been a transformative figure in engineering education and industry partnerships. As the founding Secretary General of the NED International Alumni Network (NEDIAN) Association, Pakistan, he has championed initiatives that strengthen ties between academia and industry. His instrumental role in major university projects—such as the City Campus Mosque, STEM Center, and the ASHRAE-Anwar Saadat HVACR Research Center—has left a lasting impact.

Engr. Abbas has also played a key role in shaping policies as a Senate Member, ORIC Committee Member, and Industrial Advisory Board Member at NED University. His dedication to student development is evident through his leadership in the Lead the Nation Mentorship Program, a collaborative effort between NEDIAN-Pakistan and NEDIAN-North America, which has mentored over 2,000 aspiring engineers.

Beyond his academic contributions, Engr. Abbas is a seasoned entrepreneur. He founded Engineering Services in 1984, a company that has since expanded its operations across Pakistan and Saudi Arabia. His leadership within ASHRAE, the Pakistan HVACR Society (PHVACR), and the Institution of Engineers Pakistan (IEP) has earned him a distinguished reputation in the industry. Among his notable accolades are:

- ASHRAE Distinguished Service Award
- ASHRAE Regional Award of Merit
- ASHRAE Chapter Service Award
- Lifetime Achievement Awards from PHVACR Society and IEP

Having served in key leadership positions—including Past President of ASHRAE Pakistan, President of PHVACR Society, and ASHRAE South Asia Sub-Regional Chair—Engr. Abbas has played a pivotal role in advancing the HVACR and mechanical engineering industries in Pakistan and beyond.

The inauguration of the Engr. M. Abbas Sajid Board Room took place on March 21, 2025, in the presence of Dr. Sarosh Hashmat Lodi, Vice-Chancellor of NED University, alongside Engr. Abbas Sajid.

The ASHRAE Pakistan Chapter takes great pride in celebrating this well-deserved recognition and extends its heartfelt congratulations to Engr. Abbas for his outstanding contributions to the profession.

KARACHI: PR

Mari Energies Commences Hydrocarbon Production from Shewa Discovery in Waziristan Block

Mari Energies Limited, formerly Mari Petroleum Company Limited (MARI), has commenced hydrocarbon production from the Shewa discovery in Waziristan Block, located in Khyber Pakhtunkhwa.

The E&P disclosed the development in a notice to the Pakistan Stock Exchange (PSX) on Tuesday.

"We are pleased to announce that gas and condensate production has commenced from the Shewa discovery located in Waziristan Block in KP Province under the Extended Well Testing (EWT) phase, after the completion of the gas transmission pipeline by SNGPL," read the notice. MARI shared that the current average production rates are 26 MMSCFD of gas and 244 BBLs/D of condensate.

"Production is being gradually ramped up to its full potential after achieving stabilization of gas processing plant operating parameters and export systems," it said. Mari Energies is the operator of Waziristan Block, with a 55% working interest, along with Oil and Gas Development Company Limited and Orient Petroleum Inc. as joint venture partners, holding 35% and 10% working interests, respectively.

"This major milestone represents a significant achievement for enhancing the energy security of the country and positively contributing towards the socio-economic development of this region," MARI added. Last month, MARI discovered hydrocarbon reserves at the Spinwam-1 exploration well in Khyber Pakhtunkhwa.

As per the company's latest financial results, MARI posted a profit-after-tax (PAT) of Rs 11.17 billion in the second quarter of fiscal year 2025 (2QFY25), a decline of over 39% year-on-year (YoY), compared to a PAT of Rs 18.36 billion in the same period of the previous year. The decline in profit was attributed to lower revenue and higher expenses incurred during the period. - ER

Arif Habib Resigns from PNSC Board of Directors

Arif Habib has resigned from the position of Member of the Board of Directors of the Pakistan National Shipping Corporation (PNSC), according to a corporation notice to the Pakistan Stock Exchange (PSX).

"We are pleased to inform you that Arif Habib has resigned from the position of Member of the Board of Directors of the Pakistan National Shipping Corporation (PNSC), with effect from March 17," reads the notice given to the exchange. - ER

Green Yakeen – A Bold Step Towards a Greener, Sustainable Pakistan

In a landmark move towards environmental restoration and sustainability, Green Yakeen, an ambitious plantation drive under the Heal Pakistan initiative, was inaugurated on World Forest Day.

This initiative—born from a strategic collaboration between NESPAK and Synergy Inc.—marks a significant leap in fostering a sustainable and climate-resilient Pakistan.

The inauguration was led by Zargham Eshaq Khan, Managing Director of NESPAK, and Ambreen Sipra, CEO of Synergy Inc., alongside senior NESPAK officials. Also present was Jamshaid Faisal Janjua, the strategic curator of Heal Pakistan and Project Manager of various mega initiatives across the country. Emphasizing the urgent need for collective action, he stated, "Green Yakeen is more than a plantation drive—it is a movement. Through strategic collaborations, we are not just fighting environmental degradation; we are securing a sustainable legacy for future generations."

The event also received strong support from the private sector, with Faraz, Head/Director PMO, Packages Group, attending as Guest of Honor. Reflecting on the importance of environmental responsibility, he shared, "I want to see the skies as clear as I remember them while lying in the courtyards of my ancestral home. And I believe that can only be achieved through these collaborative efforts." His sentiments were met with widespread applause, reinforcing corporate confidence in NESPAK and the broader Heal Pakistan vision.

"Green Yakeen is not just about planting trees; it's about planting hope for a better tomorrow," stated Ambreen Sipra, emphasizing that the drive aligns with Pakistan's sustainability goals. She highlighted its far-reaching impact beyond afforestation—promoting cleaner air, biodiversity conservation, and climate resilience.

Zargham Eshaq Khan reiterated NESPAK's unwavering commitment to green infrastructure and sustainability-driven initiatives. "With projects like Green Yakeen, we are not just building landscapes; we are shaping a future where sustainability is at the core of development," he remarked.

The event concluded with a symbolic plantation ceremony, where stakeholders reaffirmed their commitment to a greener Pakistan. Green Yakeen sets the stage for more public-private partnerships, leveraging corporate and institutional expertise to drive environmental change. — PR

FPCCI Pushes for Economic Consensus with Charter of Economy

The Federation of Pakistan Chambers of Commerce & Industry (FPCCI) presented a Charter of Economy to Finance Minister Muhammad Aurangzeb on Tuesday, emphasizing political consensus to address Pakistan's economic challenges.

Led by Atif Ikram, the FPCCI delegation highlighted that the charter aims to prioritize national economic growth, particularly to support the country's youth-driven demographic. Senator Noman Wazir Khattak detailed key proposals, including the restructuring of specialized civil services in critical sectors like energy, finance, industry, and health to enhance policy formulation.

The charter advocates for solar and wind energy adoption, capping wheeling charges for the Competitive Trading Bilateral Contract Market (CTBCM) at Rs4 per KWh. It also calls for regional trade expansion, urging financial institutions to allocate at least 20% of lending for long-term CAPEX and 10% for startup CAPEX.

Further recommendations include:

- A stable exchange rate to boost exports and restrict non-compliant imports.
- Uniform gas pricing across industries to spur growth.
- Transferring State-Owned Enterprises (SOEs) to employees for management or privatization.
- Progressive taxation in agriculture, improved governance, and pension fund restructuring into equity.
- Digitalization, bankruptcy law reforms, and debt management strategies.

Finance Minister Aurangzeb praised the FPCCI's efforts, emphasizing the need for long-term economic reforms over quick fixes. He acknowledged the importance of stakeholder collaboration in shaping a sustainable economic strategy. -- ER

Jawed Masood appointed RSM Imperial Electric

As part of its ongoing efforts to optimize human resources, The Imperial Electric Co. (IEC) has appointed Javed Masood as Regional Sales Manager – South at its Karachi office to oversee the sales of Switchgear Components, including Schneider and Chint products.

With 25 years of experience, including international roles, Mr. Masood brings extensive expertise across multiple business functions such as finance, imports, logistics, procurement, and sales support. His broad industry exposure, strong business acumen, and problem-solving approach make him an ideal leader to drive IEC's growth in the region.

About The Imperial Electric Co.

The Imperial Electric Company (Pvt) Limited (IEC) was established in 1931 has the privilege of supplying DG sets on turnkey basis to its different Clients since 1989. They are manufacturing diesel generating sets in Pakistan as OEM since 1998. IEC is an ISO 9001:2015, 14001:2015 & 18001:2007 certified company.

IEC is also involved in projects of Airports, and working on many Airport Projects in Pakistan.

IEC represents some of the world's renowned manufacturers including Schneider Electric, CHINT, General Electric, Safegate Group, Thorn Lighting, JBT, AeroTech.■

Cheetal Technology Expands Operations, Strengthens Industrial Automation Offerings

Cheetal Technology (Pvt.) Ltd., a leading provider of industrial automation and SCADA solutions, has become a private limited company.

They have also acquired a new office to support their growing operations and technological advancements.

Cheetal Technologies are preparing to launch FMS V2, their next-generation SCADA-based Facility Management System with advanced remote monitoring capabilities. Additionally, they have integrated Overall Equipment Effectiveness (OEE) modules, empowering industries with practical insights to improve operational reliability, reduce downtime, and maximize productivity.

Cheetal Technology is also collaborating with Digitech Electric in delivering an IoT platform for their newly launched solar inverters, offering real-time system visibility through a dedicated mobile app. This solution ensures not just convenience for end-users but also business intelligence for distributors and manufacturers, enabling proactive maintenance, optimized energy performance, and seamless after-sales support.

The specialty of Cheetal Technology is that they convert your data into meaningful actions that drive efficiency, reduce operational costs, and enhance system longevity. Our solutions are designed to help industries move beyond reactive maintenance and towards intelligent, predictive operations that ensure long-term sustainability and profitability.■

EU-funded Erasmus Plus Project CATCH_VR MUET, QUEST hold Curriculum Development Workshop for Masters in AR/VR and digital Twin

MUET hosted a joint hybrid meeting for eight European and Pakistani partners for the Erasmus+-funded "2nd Workshop on the Curriculum Development and Project Review meeting " in a hybrid mode focusing on Capacity Building in Teaching in AR and VR, namely CATCH_VR.

The event started with opening remarks and an overview of overall progress, including the status of deliverables and milestones, by Prof. Dr. Bhawani Shankar Chowdhry, Coordinator and Project Manager of the EU-funded Erasmus Plus project CATCH_VR. Prof Chowdhry emphasized all the partner universities to go through the Task list and follow their timeline in completion of given tasks.

A presentation on "EON-XR Platform: Advancing VR in Industry and Education" by Dr. Lehel Szaboics Csokmai, Research engineer in CCIITA research center and the Industrial Engineering PhD school at University of Oradea Romania. There was an insightful discussion on the role of AR/VR in teaching and its impact on various fields. He shared various resources and project details. A Curriculum Development workshop followed it. Prof Dr. Ali Turab Jeffery, from GIKI presented the detailed framework of core areas and relevant labs. Prof. Dr. M Tahir Khan, from UET Peshawar, gave a detailed presentation on the lab equipment and the center of excellence in Digital Twin.

Prof. Dr. Pardeep Kumar from QUEST and Muhammad Zakir Sheikh updated on the dissemination activities of the project using all the social media platforms and the CATCH_VR portal (https://catchvr-cbhe.eu/).

Prof Dr Aneel Kumar decorated the visiting guest with Souvenirs and appreciated efforts of Pakistani and European partners for completing the tasks in time.■

Aror University Unveils OGDCL Game Design Lab: A Leap in Digital Innovation

Aror University of Art, Architecture, Design & Heritage in Sukkur has marked a significant milestone with the inauguration of the OGDCL Game Design Lab.

This state-of-the-art facility, sponsored by the Oil & Gas Development Company Limited (OGDCL), was officially opened on February 7, 2025, by Ahmed Hayat Lak, MD/CEO of OGDCL.

The OGDCL Game Design Lab is a remarkable addition to Aror University's academic infrastructure, aimed at advancing education in game development and related technological fields. The facility boasts 17 high-performance workstations equipped with the latest NVIDIA GPUs, enabling students to create sophisticated 3D models, immersive game environments, and complex simulations.

The inauguration ceremony was graced by several distinguished guests, including Mumtaz Ali Soomro, Executive Director (Production) at OGDCL; Sikandar Ali Shaikh, General Manager (CSR) at OGDCL; Aamir Ali Khan Ghouri, Director of Icon by Ghouris; Engr. Abdul Fatah Shaikh, Former President of the Sukkur Chamber of Commerce; Prof. Dr. Dur Muhammad Pathan, Pro Vice Chancellor of MUET Khairpur Campus; and Shabir Memon, Director of Pakistan Sweet Home Sukkur.

Prof. Dr. Zahid Hussain Khand, Vice Chancellor of Aror University, expressed his gratitude towards OGDCL for their generous support in establishing the Game Design Lab. He emphasized that this initiative aligns with the university's commitment to providing world-class education, fostering innovation, promoting entrepreneurship, and equipping graduates with industry-relevant skills.

The collaboration between Aror University and OGDCL signifies a shared commitment to advancing education in technology and creative industries. The lab offers students a unique opportunity to develop expertise in game design, 3D modeling, and interactive simulations, ensuring they are well-prepared for the rapidly evolving digital landscape.

Educational, Research, and Economic Impact

Educational Benefits:

Hands-on skills development in game design, 3D modeling, and virtual simulations.

Enhancement of the curriculum with advanced tools and software.

Opportunities for collaboration with industry experts through internships, workshops, and guest lectures.

Research and Innovation:

A platform for exploring new frontiers in game mechanics, artificial intelligence, and user experience.

Research applications in education, healthcare, and urban planning through gamification and simulation.

Development of emerging technologies like Virtual Reality (VR) and Augmented Reality (AR).

Economic Contributions:

Preparation of students for careers in game development, tech companies, and startups.

Encouragement of entrepreneurship through training in game design and digital media.

Attraction of investment in technology, education, and creative industries.

Strengthening of Sindh's growing tech ecosystem by producing skilled professionals for local and international markets.

Unique Standing Among Pakistani Universities

The OGDCL Game Design Lab at Aror University is the first dedicated facility of its kind in Sindh. While universities across Pakistan, such as NUST, COMSATS, BNU, LUMS, and FAST-NUCES, have game development labs, this facility sets a new benchmark for game design education in the province.

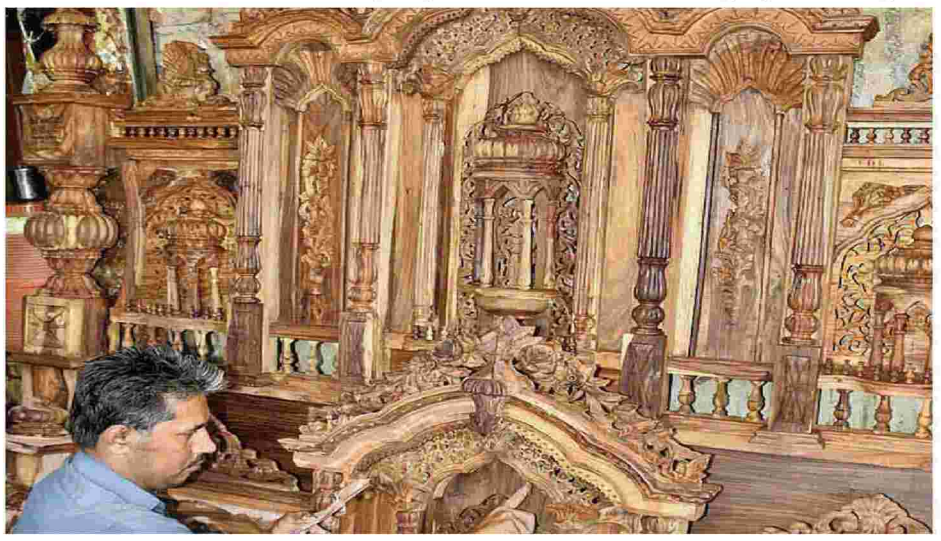
Other institutions offering game design programs include Iqra University, Punjab University, and the University of Sargodha, each providing state-of-the-art labs and coursework focused on multimedia, animation, and interactive media. Among these, NUST, COMSATS, and BNU are recognized for their cutting-edge research in AI-driven gaming and immersive media technologies.

Investment and Sustainability

Setting up a Game Design Lab requires substantial investment in infrastructure and technology. The estimated cost for establishing such a facility ranges between PKR 20 million to 50 million, with annual operational expenses of PKR 5 million to 10 million. These costs cover high-performance workstations, software licenses, maintenance, and faculty training.

With its state-of-the-art resources, industry collaborations, and a strong focus on innovation, the OGDCL Game Design Lab at Aror University is poised to become a leading hub for education, research, and economic development in the digital and creative sectors of Pakistan. – ER Report

Chemicals to Furniture: Shaffi Chemical Industries Shifts Business Focus



Shaffi Chemical Industries Limited (SHCI) has announced a major shift in its business strategy, moving from chemical production to furniture manufacturing.

The company disclosed this strategic change in a notice to the Pakistan Stock Exchange (PSX) on Friday. According to the notice, the company's Board of Directors (BoD) reviewed and approved a new growth strategy that includes the revival of operations through the production of furniture products at its factory premises.

"As part of our future strategy, we are now focused on manufacturing furniture products. The Board of Directors has decided to shift our primary business to furniture manufacturing," the company said in the statement. In line with this change, SHCI plans to amend its Memorandum of Association (MoA) to reflect the new business direction, as required by the Companies Act, 2017. The company will officially designate furniture manufacturing as its principal line of business. Additionally, the BoD has proposed changing the company's name from "Shaffi Chemical Industries Limited" to "Shaffi Industrial Enterprises Limited," a move that is subject to approval from the Securities and Exchange Commission of Pakistan (SECP). To support its new business focus, SHCI has also decided to increase its authorized capital from Rs 120 million to Rs 400 million. This capital increase will facilitate a forthcoming rights issue for fundraising and equity expansion. Previously, SHCI's main activities included the production of Di-OctylOrtho Phthalates (DOP) chemicals, with its current products including Lith and Diltex binders. However, with this strategic pivot, the company aims to tap into the growing furniture manufacturing market in Pakistan. = ER

Redco Textiles Limited Announces PKR 800 Million Capital Investment to Expand Production Capacity

Redco Textiles Limited, a leading public limited company listed on the Pakistan Stock Exchange (PSX), announced a significant capital investment of PKR 800 million for the acquisition of plants and machinery.

This investment is aimed at expanding the company's existing production capacity to meet growing demand and strengthen its position in the textile industry, according to the information shared by the company with the Pakistan Stock Exchange (PSX).

The Board of Directors of Redco Textiles Limited approved the capital investment during its meeting held on March 17, 2025. The investment is expected to enhance Redco's operational capabilities and improve efficiency in the manufacture and sale of yarn and greige fabric, which are the company's principal products. Redco Textiles, incorporated on October 17, 1991, under the now-repealed Companies Ordinance, 1984 (and currently governed by the Companies Act, 2017), has been a prominent player in the textile manufacturing sector. The company has earned its place on the Pakistan Stock Exchange with a consistent focus on quality production and sustainable growth. The new investment signifies Redco's commitment to further strengthening its infrastructure and expanding its presence in both domestic and international markets. – ER

Tariq Corporation to Install 200 KW Solar Power System to Boost Sustainability and Efficiency

Tariq Corporation Limited (TCORP), engaged in the manufacturing of sugar and its by-products, has become the latest company to adopt renewable energy, as it announced plans to set up a 200 KW solar power system at its facility. The listed company shared the development in its notice to the Pakistan Stock Exchange (PSX) on Monday.

"We are pleased to inform you that Tariq Corporation Limited (TCORP) has decided to install a 200 KW solar power system, reinforcing its commitment to improving sustainability and operational efficiency. It is expected to significantly reduce TCORP's annual electricity costs and lower our carbon footprint," it added. - ER

AGRI TECH

Sindh showing several positive signs

The agriculture sector in Sindh is showing several positive signs despite challenges such as climate change and water scarcity. Some key developments include 1. Increased Wheat and Rice Production, 2. Expansion of Drip Irrigation and Water Conservation, 3. Rise in Sugarcane and Cotton OutputSugarcane production has improved due to better farm management practices and incentives for growers, 4. Growth in Horticulture (Fruits & Vegetables), 5. Government and Private Sector Investments, 6. Livestock and Dairy Sector Growth.■

NSDRA Shuts Down 392 Non-Compliant Seed Companies to Ensure Quality Standards

Islamabad – The National Seed Development and Regulatory Authority (NSDRA) has decided to shut down 392 seed companies that failed to meet regulatory standards, reinforcing its commitment to ensuring high-quality seed supply in Pakistan.

Federal Minister for National Food Security and Research, Rana Tanveer Hussain, presided over the second meeting of NSDRA's Board of Governors, where strict measures were discussed to enhance seed quality in alignment with Prime Minister Muhammad Shehbaz Sharif's vision.

During the meeting, the minister emphasized that certified seeds must be the priority and reaffirmed the government's resolve to enforce strict quality standards in the agricultural sector. A third-party audit of seed companies was extensively reviewed, and NSDRA, in collaboration with the Federal Seed Certification Department, took action based on the audit findings.

NSDRA officials presented their action plan, leading to the unanimous decision to immediately close 392 seed companies that failed to comply with the authority's regulations. The board members agreed that firm action was necessary to uphold seed quality and ensure a robust regulatory framework for the sector.

Minister Hussain assured that the Ministry of National Food Security and Research is dedicated to maximizing the agricultural sector's potential. He stated that such decisive steps will bring long-term benefits to farmers and contribute to national food security. – PID/ER Monitoring Desk

Agriculture Vision 2030

By: Ishrat Husain

A fast growing economy, a rising urban middle class, a predominantly young educated population and the changes in climatic conditions will have serious repercussions on food production, food security, nutritional status and cropping pattern in the not so distant future.

Although economic growth rates have slowed down in the last five years, Pakistan's long term annual growth of per capita income has been around 2.5 percent. It is estimated that in real terms, per capita income had quadrupled four times by 2003. If the growth rate reverts to the historical mean, an average Pakistani will be earning eight times higher in real times by 2031. At present, this may look like a herculean task but good governance, sound economic management and continuity and consistency in economic policies would make it happen.

This general affluence will be accompanied by a rising middle class. The proportion of the middle class in 2010 is estimated to be one-third of the total population i.e. approximately 60 million. By 2030, Pakistan's population would be around 260 million and if the current trend of urbanization and income growth persists, about 150 million people will fall in middle income class category. Their incomes and living standard would be comparable to those in Southern European countries with average incomes of over $20,000 a year. This class will comprise mainly of professionals, businessmen, public,

private, NGO sector executives and services providers etc.

More than 60 percent of Pakistanis will be living in megacities, metropolitan areas, large cities, towns and peri-urban localities by 2030. Urban population growth rate has been twice as fast as rural because of

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Agriculture Vision 2030

Contd from page 8

migration. The pull factor of the cities largely due to better jobs and livelihood opportunities act as a magnet for the migrants to Karachi and Lahore. Other big cities by 2030 would be Faisalabad, Rawalpindi, Multan, Hyderabad, Gujranwala, Peshawar and Quetta.

By 2030, 67 percent of the total population will fall in age group 15-64. As life expectancy rates and health standards improve and female literacy rates rise the proportion of working population with both members of the family earning incomes, will also show an upward incline. Urban Literacy Rate in 2011-12 was 74 percent compared to 48 percent in the rural areas. By 2030 not only the urban literacy rate would cross 100 percent mark but the ratio of college and university graduates, skilled and technically qualified manpower and high-end professionals would be significantly large.

These changes in incomes, location, demography, educational and nutritional status would exert a demand for foods very different from the existing pattern. The tastes and preferences of urban educated middle class, with higher income will generate a shift in the food consumption basket away from cereals towards meat, poultry, dairy products, edible oil, fruits & vegetables, sugar, fish, etc.

On the supply side, the rate of increase in global food output has slowed down. Rates of investment in agricultural are lower, competition for water and land is becoming tough, the pace of new technology and innovation breakthroughs has slowed down, cost of production is rising due to high petroleum prices and the subsidy policies of high income countries continue to create price distortions in world commodity markets. Projections show that real prices for food and the inputs for agricultural production will remain higher for the coming decade compared to the past decade. This implies that Pakistan will be better off if it plans to produce food items domestically by taking advantage of its irrigated land, low cost labor and technological innovations.

In Pakistan, the average growth rate of agriculture has decelerated from 5.4 percent in the 1980s to 3.2 percent in 2000s. Any technological breakthrough of the Green Revolution type does not appear imminent in the immediate future and therefore this growth rate is unlikely to improve in the coming decade. There have also been perceptible changes in the composition of national output and agricultural sector. Agriculture now accounts for only one-fifth of the national output and this share in all probability will slip downwards to 12-15 percent by 2030. Surplus Agriculture labour force that is about 40 percent presently will also move out and expected to be absorbed in the fast growing urban centres and burgeoning services sector. Educated labor force would not stay in agriculture unless new technologies or innovative practices requiring skilled manpower are introduced. Rough estimates put the labor force working in agriculture and agriculture-allied activities at 30 percent of the total employed by 2030. Unless these constraints are removed, the domestic food supply situation does not look as promising as it did in the decades of 1980s and 1990s.

Past historical evidence, however suggests, that labor and land productivity gains can take care of the additional demand for food, provided all the inputs such as energy, irrigation water etc. are available proportionately and input price hikes do not outstrip the output price increases. Productivity per unit of land and per unit of water in Pakistan relative to Indian Punjab is low and there is thus much scope for increasing productivity. Furthermore, the mix of agriculture output has to change from staple grains and cereals to high value agricultural commodities. Livestock and Dairy products now account for more than 50 percent of the agriculture value added while 35 percent originates from the major crops, 11 percent from minor crops (lentils, fruits, vegetables etc.) and 3 percent from fisheries and forests. By 2030, the contribution of Livestock, Diary subsector and Minor Crops will have to rise at the expense of grains and cereals. There are a host of sectoral reforms that have to be implemented in the next 20 years to achieve the postulated productivity gains and meet the changing demand pattern. – Courtesy IBA, Karachi

(to be continued)

Powering the Future

A Smart Balancing Market for Pakistan's Solar Revolution

By: Farhan Mujeeb

Pakistan's power sector is undergoing a rapid transformation, driven by an influx of solar energy from rooftop solar PV installations.

While this shift aligns with the country's renewable energy targets, it also presents significant challenges for grid stability, economic dispatch, and real-time energy adjustments. Without a structured balancing market, Pakistan risks increased system inefficiencies, renewable energy curtailment, and economic losses.

The integration of intermittent solar power creates supply-demand mismatches, leading to frequency fluctuations and costly grid interventions. The duck curve phenomenon—where solar reduces daytime demand but creates steep ramp-up needs in the evening—is becoming a growing concern. Additionally, excess solar generation during off-peak hours often leads to curtailment, where valuable renewable energy goes unused. Currently, Pakistan's Single Buyer Market Model, managed by the Central Power Purchasing Agency (CPPA-G), lacks a real-time balancing mechanism. Without a dedicated market for short-term flexibility services, adjustments rely on expensive and inefficient manual interventions, often increasing electricity costs for consumers.

A competitive balancing market can address these challenges by providing real-time price signals and procuring flexibility services from a mix of technologies, including Battery Energy Storage Systems (BESS).

BESS can play a pivotal role in supporting grid stability, especially in a high-renewable energy environment. By providing fast-response frequency regulation, peak load management, and energy arbitrage, BESS can mitigate the variability of solar power. According to Dr. Tariq Mehmood, an energy expert and professor at the National University of Sciences and Technology (NUST),

"Battery storage technology has proven itself as a key enabler for renewable energy integration worldwide. Pakistan must take proactive measures to incentivize its deployment to ensure a stable and reliable power system."

His insights underscore the necessity of modernizing Pakistan's grid infrastructure and creating incentives for storage investments.

The benefits of BESS are vast. It can respond within milliseconds to grid fluctuations, reducing reliance on expensive spinning reserves. Excess solar energy can be stored during the day and discharged during evening peaks, flattening demand curves. Instead of wasting surplus solar energy, BESS can absorb excess supply and release it when needed. Moreover, BESS can provide backup power and participate in the balancing market, ensuring real-time adjustments at minimal cost.

Dr. Ayesha Khan, a senior policy advisor in the renewable energy sector, highlights:

"Pakistan needs an integrated approach where policy frameworks, financial incentives, and technological advancements work together to support energy storage and grid flexibility."

To fully harness solar energy and BESS potential, Pakistan must introduce a well-structured balancing market and regulatory framework. Creating a transparent, competitive market for procuring short-term flexibility services is essential. Regulatory support must be provided to recognize energy storage as a market participant, allowing it to offer ancillary services. Smart grid development, including SCADA and metering infrastructure upgrades, should be prioritized to enable real-time dispatch and grid optimization. Financial mechanisms, such as capacity payments, should be introduced to encourage private-sector investment in BESS. Additionally, engaging rooftop solar owners in grid balancing through time-of-use tariffs and virtual power plant models can enhance efficiency and sustainability.

Pakistan stands at a crossroads. Without market-driven reforms, increasing solar penetration could lead to inefficiencies, instability, and economic losses. By implementing a balancing market and promoting BESS adoption, the country can ensure a reliable, cost-effective, and sustainable energy future. It is time for policymakers, regulators, and industry leaders to act decisively.

The future of Pakistan's power sector depends on smart market mechanisms that enable the seamless integration of renewable energy.■

The Role of Holographic Technology in Virtual Collaboration Management

Engr. Dr. Muhammad Nawaz Iqbal

Holographic technology is transforming the world of virtual collaboration management by creating immersive, three-dimensional environments that enhance remote interactions.

Unlike typical video conferencing tools, holography presents participants as real-life, full-scale holograms, fostering a more natural and engaging communication experience. This advancement strengthens collaboration, particularly in industries where visualization is critical and spatial awareness is of utmost importance. One of the most significant benefits of holographic technology for virtual collaboration is its ability to bridge physical distances by creating a truly immersive virtual experience. In traditional virtual meetings, participants often struggle to engage with one another through a flat, two-dimensional screen. Holography eliminates this limitation, offering dynamic and interactive 3D representations that make collaboration feel almost like an in-person experience.

The integration of holography into teamwork and productivity takes collaboration to an entirely new level. For instance, product development teams can collaborate in real-time on modifications and improvements to holographic prototypes instead of relying on physical models for certain changes. These applications accelerate the design cycle and reduce expenses related to physical prototyping and logistics. Holography also plays a vital role in education and training. For example, medical students can practice surgical procedures using holographic representations of the human body, allowing them to gain hands-on experience without any real-life risk. Similarly, corporate training programs can incorporate holographic simulations, enabling employees to engage in realistic scenarios for more effective learning.

Holographic technology fosters global collaboration by eliminating geographical barriers. When team members are located in different places, they can participate in an all-holographic conference—a virtual space where employees interact as if they were in the same room. This strengthens professional relationships, reduces travel costs, and promotes knowledge sharing. Additionally, holography holds a prominent role in architectural and engineering practices for project visualization. Engineers and designers can study structures from any angle, test different configurations, and even detect potential flaws before construction begins. This high level of visualization enhances decision-making and improves the overall efficiency of large-scale projects.

The healthcare industry is also leveraging holographic technology to improve telemedicine and remote treatment options. Patients, from the comfort of their homes, can interact with holographically rendered 3D images of themselves, allowing doctors to make more accurate diagnoses and prescribe better treatment plans. This is especially beneficial for rural or underserved areas, where access to specialized healthcare services is often limited.

Another key advantage of holography is its ability to revolutionize business presentations and marketing. Sales teams and executives can showcase products using vivid 3D holograms, simplifying complex concepts and creating compelling customer experiences that increase engagement and improve negotiation outcomes. In retail, holographic displays offer interactive shopping experiences, including virtual try-ons, holographic product demonstrations, and immersive brand storytelling. These innovations not only enhance customer engagement but also influence purchasing decisions and improve overall customer satisfaction.

Holographic meeting rooms are now being integrated into smart workplaces, where employees collaborate on everyday tasks. Smart meeting rooms equipped with holographic displays enable employees to brainstorm, strategize, and solve problems in a highly interactive environment. This fosters creativity, innovation, and efficiency in business operations. However, despite its many benefits, security and privacy concerns remain significant barriers to the widespread adoption of holographic technology for virtual interactions. Because holographic meetings transmit highly detailed 3D data, organizations must implement advanced security measures to prevent unauthorized access, data breaches, and cyber threats that could compromise sensitive information.

Despite these challenges, the adoption of holographic technology continues to rise, driven by advancements in artificial intelligence (AI) and cloud computing, which make the technology more accessible and user-friendly. As AI-powered holographic avatars become more sophisticated, businesses are expected to see greater efficiencies in customer service, training, and automated collaboration.

Holographic collaboration also aligns with sustainability goals by significantly reducing business travel, thereby lowering carbon footprints and promoting eco-friendly business practices. This supports corporate sustainability initiatives and global efforts to combat climate change.

With continuous research and development, holography is expected to become seamlessly integrated into mainstream business operations. As the technology advances, it will offer even higher levels of immersion, efficiency, and effectiveness, marking a new era in virtual collaboration.■

فرمانِ قائداعظمؒ

ایمان ، اتحاد ، تنظیم

آزادی اور قربانی

پس جہاں تک ممکن ہو ہمیں اپنے حریفوں کو سمجھانے کے لئے عقل اور دلیل سے کام لینا چاہیے۔ میں جانتا ہوں کہ دلیل اور عقل ہمیشہ ہی کامیاب نہیں ہوتیں لیکن ہمیں اپنی طرف سے پوری کوششیں کرنی چاہیئے۔ جو لوگ فی الحال لاہور کی قرارداد پاکستان کے خلاف ہیں، ہمیں ان کے دل میں غیر ضروری تلخی پیدا نہیں کرنی چاہیے۔ آخر ہمیں ضرورت ہی کیا ہے؟ مجھے پورا پورا یقین ہے کہ ہمارے یہی حریف ایک نہ ایک دن محسوس کر لیں گے کہ ہندوستان کے انتہائی پیچیدہ مسئلے کا واحد اور بہترین حل قیام پاکستان ہے کہ جس کے قیام کی نظیر پوری دنیا کی تاریخ میں نہیں ملتی۔

(پنجاب مسلم سٹوڈنٹس فیڈریشن۔2 مارچ 1941ء)

آوازِ اقبال

اقبال کا ترانہ بانگِ درا ہے گویا
ہوتا ہے جادہ پیما پھر کارواں ہمارا

آہ! یہ دست جو اے گل رنگیں نہیں
تو شناسائے خراش عقدۂ مشکل نہیں
کس طرح تجھ کو یہ سمجھاؤں کہ میں گل چیں نہیں
اے گل رنگیں ترے پہلو میں شاید دل نہیں
کام مجھ کو دیدۂ حکمت کے الجھیڑوں سے کیا
زیب محفل ہے شریک شورش محفل نہیں
دیدۂ بلبل سے میں کرتا ہوں نظارہ تر
یہ فراغت بزم ہستی میں مجھے حاصل نہیں
اس چمن میں، میں سراپا سوز و ساز آرزو
اور تیری زندگانی بے گداز آرزو
توڑ لینا شاخ سے تجھ کو مرا آئیں نہیں
یہ نظر غیر از نگاہ چشم صورت میں نہیں

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بجلی جلد سستی؟

آج کے دور میں تمام کاروبار زندگی کا انحصار بجلی پر ہے۔ اس کی مہنگائی زندگی کو دشوار اور ارزانی آسان بناتی ہے۔ پاکستان میں آئی پی پیز یعنی انڈیپنڈنٹ پاور پروڈیوسرز کہلانے والے اداروں کی بھاری منافع خوری کے سبب ہمارے ملک میں بجلی کے نرخ خطے کے تمام ملکوں سے کہیں زیادہ چلے آرہے ہیں۔ تاہم یہ امر خوش آئند ہے کہ عوامی مطالبے کو تسلیم کرتے ہوئے وفاقی حکومت نے ان اداروں کی شرائط کار کو قومی مفاد کے مطابق بہتر بنانے پر توجہ دی جس کے مثبت نتائج ایک ہی سال میں نمایاں ہوگئے ہیں اور ذرائع کے مطابق حکومت بجلی کے نرخوں میں جلد بڑی کمی کا اعلان کرنیوالی ہے۔

اس کی ایک وجہ یہ ہے کہ پاور ڈسٹری بیوشن کمپنیوں (ڈسکوز) نے ڈالر کے نرخ توقع سے کم رہنے اور شرح سود میں کمی کے باعث رواں مالی سال کی دوسری سہ ماہی کیلئے 52.123 ارب روپے کی منفی ایڈجسٹمنٹ کی درخواست کی ہے جس سے بجلی کے ایک یونٹ کی قیمت میں تقریباً دو روپے کی کمی آئے گی۔ علاوہ ازیں اطلاعات ہیں کہ وزیراعظم اپریل سے صنعتی اور گھریلو صارفین کیلئے 7 روپے فی یونٹ کی مزید کمی کا اعلان کرینگے۔ اس طرح ملک میں بجلی کا ایک یونٹ نو سے دس روپے تک سستا ہوجائیگا۔

مزید یہ کہ 5 آئی پی پیز کے لیے بجلی کی خریداری کے معاہدوں کو ختم کرنے کیساتھ ساتھ 8 آئی پی پیز اور 15 دیگر آئی پی پیز کے معاہدوں پر نظرثانی کے نتیجے میں سالانہ 137 ارب روپے کی بچت ہوگی۔ یہ بچت، توانائی کے اخراجات کو 1.14 ٹریلین روپے تک کم کرنے کی وسیع تر کوشش کا حصہ ہے جو صارفین کو منتقل کیا جائے گا۔ اس تفصیل سے یہ امکان روشن ہے کہ بجلی کے نرخوں میں قابل لحاظ کمی کا سلسلہ بہت جلد شروع ہوجائیگا، اسکے مثبت اثرات معیشت سمیت ہر شعبہ زندگی پر مرتب ہونگے لہٰذا اسکے بعد حکومت کو مجموعی مہنگائی کی محض رفتار میں نہیں بلکہ تمام صنعتی و زرعی اشیا کی قیمتوں میں حقیقی کمی کو یقینی بنانا چاہیے۔■

Sales Blog for Young Engineers and Entrepreneurs

THE POWER OF TRUST, INTEGRITY AND HUMILITY

Muhammad Tariq Haq | ESL

Once upon a time, there was a team led by a young and insightful leader named Ali. One afternoon, as the team gathered for their weekly meeting, Ali decided to share a story that he hoped would inspire his team and reinforce the values he believed were crucial for effective leadership.

"Team," Ali began, "I want to talk about something that I believe is more important than any skill or experience a leader can have—trust, integrity and humility."

He paused, letting the word sink in, and then continued, "Have you ever worked under a leader who made promises that were never kept? Or someone who took credit for our hard work but disappeared when things went wrong? I have, and the impact was profound—trust was shattered, morale plummeted, and our productivity suffered."

The team nodded, recalling their own experiences with such leaders.

"But think about the leaders who truly inspired you," Ali went on. "Were they the loudest in the room, or were they the ones who led with quiet confidence, honesty, and a deep sense of responsibility? The leaders we admire most are those who earn respect, not demand it."

"A leader's reputation is their greatest asset. Skills and experience matter, but in the long run, nothing surpasses the power of integrity. Once a leader loses trust, rebuilding it is incredibly difficult. That's why protecting your reputation with honesty and humility is not just good advice—it's the foundation of long-term success."

He continued, "In today's world, leadership isn't just about authority or expertise—it's about trust. Your reputation is built over time, through every decision you make, every word you speak, and every action you take. People are watching, even when you think no one is paying attention."

He smiled and added, "Trust takes years to build, seconds to break, and a lifetime to repair. But once a leader is known for integrity, they gain more than just respect—they build a legacy."

"Imagine working under a leader who takes responsibility for their mistakes, is transparent about challenges, treats every team member with respect, and admits when they don't have all the answers. Now, imagine the opposite. The difference is night and day."

He concluded with a powerful message, "No one willingly follows a leader they don't trust. Humility is a leadership FORTE. It doesn't mean a lack of confidence—it means having the confidence to admit when you're wrong, and to acknowledge the contributions of others."

"When leaders operate with humility, they foster stronger teams, deeper trust, and a culture of continuous growth. And the best part? Their reputation speaks for itself. People trust them—not because they have to, but because they want to."

With that, Ali wrapped up the meeting, leaving his team inspired and motivated to embrace integrity in their own leadership journeys.■

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لاہور، ساہیوال، بہاولنگر موٹروے سمیت 13 کھرب کے میگا پروجیکٹس کی منظوری

95 کلومیٹر طویل موٹروے کی لاگت بڑھ کر 1436 رب 50 فیصد پنجاب ادا کریگا 884 ارب کا سندھ فلڈ ایمرجنسی بحالی منصوبہ 71 ارب سے ریلوے بوگیوں کی خریداری بھی شامل

33 ارب سے راولپنڈی رنگ روڈ، 12.9 ارب سے ملتان وہاڑی سڑک، 19.5 ارب کا آپٹیکل ریموٹ سینسنگ سیٹلائٹ پراجیکٹ بھی منظور، گرین لائن بس ریپڈ ٹرانزٹ سسٹم آپریشنل کرنیکا جائزہ

قومی اقتصادی کونسل کی ایگزیکٹو کمیٹی (ایکنک) نے 13 کھرب روپے کے ایک درجن سے زائد میگا پراجیکٹس کی منظوری دیدی، جن میں سے کئی پہلے ہی زیر عمل ہیں لیکن ان کی لاگت میں نمایاں اضافہ ہو چکا ہے ان منصوبوں میں وفاق کی فنڈنگ سے پنجاب میں 1436 ارب روپے کی لاگت سے نئی موٹروے کی تعمیر بھی شامل ہے۔ ایکنک کا اجلاس نائب وزیراعظم اسحاق ڈار کی صدارت میں ہوا جس میں ٹرانسپورٹ، مواصلات، ریلوے، خلائی ٹیکنالوجی اور پبلک انفراسٹرکچر سمیت اہم شعبوں میں 1.275 ٹریلین روپے کے 13 ترقیاتی منصوبوں کی منظوری دی گئی جبکہ بعض موجودہ منصوبوں کی لاگت پر نظر ثانی کی گئی۔ 13 ٹریلین روپے کی لاگت اس سال کے سالانہ وفاقی ترقیاتی بجٹ سے زیادہ ہے۔ کچھ نے پراجیکٹس کیلئے صوبوں کی طرف سے بھی فنڈز فراہم کئے جاتے ہیں۔

ایکنک نے لاہور، ساہیوال، بہار نظر موٹروے کی تعمیر کی منظوری دی جس کی لمبائی 206 کلومیٹر ہے۔ اس اسکیم کی منظوری اگست 2023 میں 264 ارب روپے کی لاگت کیساتھ دی گئی تھی لیکن گزشتہ روز ایکنک نے موٹروے کی لاگت میں 65 فیصد اضافہ کے ساتھ 436 ارب روپے کرنے کی منظوری دی۔ وفاقی حکومت نے وسائل میں شدید کمی کے باوجود موٹروے کے منصوبے کو آگے بڑھانے کا فیصلہ کیا ہے جو پنجاب سے شروع ہو کر پنجاب میں ہی ختم ہوگی۔ آئی ایم ایف کی ہدایات پر وفاقی اور صوبائی حکومتوں کے درمیان طے پانے والے قومی مالیاتی معاہدے کے تحت وفاقی حکومت ایسے کسی بھی منصوبے کی فنڈنگ نہیں کر سکتی۔ وزیر اعظم شہباز شریف نے رواں سال جنوری میں پنجاب حکومت کو ہدایت کی تھی کہ وہ موٹروے کی تعمیر کیلئے کم از کم نصف فنڈز فراہم کرے۔ تاہم ذرائع نے بتایا کہ ابھی تک اس پر کوئی حتمی فیصلہ نہیں کیا گیا ہے۔ ایکنک کو بتایا گیا کہ موٹروے کے پیکیج۔ ا کیلئے 90 فیصد اراضی کے حصول کا عمل مکمل ہو چکا ہے اور نیشنل ہائی وے اتھارٹی NHA کو پی ایس ڈی پی فنڈز کے ذریعے لاہور رنگ روڈ سے رائیونڈ قصور روڈ انٹرچینج تک کام شروع کرنے کی اجازت دی جانی چاہئے جو کہ اصل منظور شدہ پی سی ون کے مطابق ہے۔ فیصلے کے مطابق این ایچ اے موٹروے کو موجودہ موٹرویز کے ساتھ منسلک کرنے کیلئے الائنمنٹ کا دوبارہ جائزہ لے گا اور نظر ثانی شدہ پی سی ون ایکنک کے جائزے کیلئے پیش کریگا جس میں تمام تبدیلیوں اور لاگت کو شامل کیا جائیگا۔ رواں سال جنوری میں وزیراعظم کی ہدایت کے پیش نظر، این انگ اے دوبارہ پنجاب حکومت سے منصوبے کی کل لاگت کا 50 فیصد حصہ مانگے گا۔ وفاقی حکومت نے جاری 10711 ترقیاتی منصوبوں کی تکمیل کیلئے 1.1 ٹریلین روپے مختص کر رکھے ہیں تاہم محصولات میں کمی کی وجہ سے کٹوتیوں کا سنگین خدشہ ہے۔ ایسے میں نئے منصوبوں کی شمولیت پہلے سے محدود وسائل کو مزید کم کر رہی ہے۔

ایکنک نے پاکستان آپٹیکل ریموٹ سینسنگ سیٹلائٹ (O2-PRSS) پراجیکٹ کی 19.5 ارب روپے کی نظر ثانی شدہ لاگت کے ساتھ بھی منظوری دی۔ اس میں 85 فیصد چینی رعایتی فنڈ تک شامل ہے۔ یہ پراجیکٹ ایک آپٹیکل پے لوڈ لے کر جائے گا جو ہائی ریزولوشن ارتھ امیجری بنانے کے قابل ہوگا۔ اجلاس میں سندھ فلڈ ایمرجنسی ری ہیب لیٹیشن پراجیکٹ (SFERP) فیز 1 کی 884 ارب روپے کی نظر ثانی شدہ لاگت کی منظوری دی گئی جو کہ 22.4 ارب روپے یا 34 فیصد زیادہ ہے۔ اس منصوبے میں صوبہ سندھ کے مختلف اضلاع میں سڑکوں کی بحالی پانی کی فراہمی، نکاسی آب کے تباہ شدہ نظام کی بحالی، غذائی تحفظ اور پائیدار ذریعہ معاش میں بہتری لانا شامل ہے۔ اس منصوبے کہ اصل پی سی ون کو ایک نے دسمبر 2022 میں 66 ارب روپے کی لاگت سے منظور کیا تھا۔ ورلڈ بینک اس کیلئے 288 ملین ڈالر قرض فراہم کر رہا ہے۔

ایکنک نے گزشتہ اجلاس میں سیلاب کے بعد ہونے والے نقصانات جیسے کہ سڑکوں، پانی کی فراہمی، اور نکاسی آب کی سکیموں کی تصاویر گلوبل پوزیشننگ سسٹم (GPS) کو آرڈی نیٹس کے ساتھ شیئر کرنے کی ہدایت کی تھی تاکہ اس بات کو یقینی بنایا جاسکے کہ فنڈز ضائع نہ ہوں۔ سندھ فلڈ ایمرجنسی بحالی پراجیکٹ (SFERP) نے ابتدائی طور پر 22 ملین سے زیادہ بے گھر گھرانوں کو کام کیلئے نقد رقم، لیبر کٹس اور بنیادی ڈھانچے کی بحالی کے لیے گرانٹس کے ذریعے مالی امداد فراہم کی۔ ایک کو بتایا گیا کہ سڑکوں کی تعمیر کی لاگت 22 ارب روپے سے بڑھ کر 37 ارب روپے ہونے کی وجہ سے لاگت میں اضافہ کیا گیا ہے۔ ایک نے اضافی ایجنڈا آئٹم کے طور پر 33 ارب روپے کے سندھ فلڈ ارنمیشن پراجیکٹ کی بھی منظوری دی۔ ایک نے 33 ارب روپے کی نظر ثانی شدہ لاگت کے ساتھ راولپنڈی رنگ روڈ R3 کی تعمیر کی بھی منظوری دی۔ اس منصوبے کا اصل پی سی 383 وان دسمبر 2021 میں 23.8 ارب روپے کی لاگت سے منظور کیا گیا تھا۔ نظر ثانی شدہ پراجیکٹ میں کلومیٹر طویل 6 لین کی رنگ روڈ بنائی جائیگی۔ منصوبے کی لاگت بڑھنے کی وجوہات میں پلیوں کی تعداد 33 سے بڑھا کر 49، انڈر پاسز کی تعداد 4 سے بڑھا کر 10 اور پلوں اور فلائی اوور کی تعداد 19 سے بڑھ کر 26 کرنا شامل ہے۔ یہ منصوبے کی ناقص منصوبہ بندی کو ظاہر کرتا ہے، کیونکہ یہ تمام چیزیں 2021 میں منصوبے کی منظوری کے وقت ملحوظ خاطر رکھی جانی چاہئیں تھیں۔ حکومت نے 71 ارب روپے کی لاگت سے 820 ریلوے بوگیوں اور 230 مسافر کوچز کی خریداری کیلئے نظر ثانی شدہ پی سی ون کی بھی منظوری دی جس پر 71 ارب روپے کی لاگت آئیگی۔

منصوبے کی لاگت میں 40 ارب یا 129 فیصد کا اضافہ ہوا ہے۔ اس منصوبے کو جون 2027 تک مکمل کیا جائے گا۔ ایکنک نے 129 ارب روپے کی لاگت سے ملتان وہاڑی سڑک منصوبے کی بھی منظوری دی جس کے تحت وہاڑی تا ملتان 93.5 کلومیٹر سڑک کو معیاری کیریج وے میں بحال کیا جائے گا۔ ایکنک نے 13.5 ارب روپے کے گرین لائن بس ریپڈ ٹرانزٹ سسٹم پراجیکٹ کو آپریشنل کرنے کا بھی جائزہ لیا اور نظر ثانی شدہ منصوبے کی انتظامی منظوری جاری کرنے کی اجازت دی تاکہ سندھ انفراسٹرکچر ڈویلپمنٹ کمپنی حکومت سندھ کو گرین لائن بی آر ٹی کے آپریشنز حوالے کرنے سے پہلے اخراجات اٹھا سکے اور اپنی ذمہ داریاں پوری کر سکے۔■

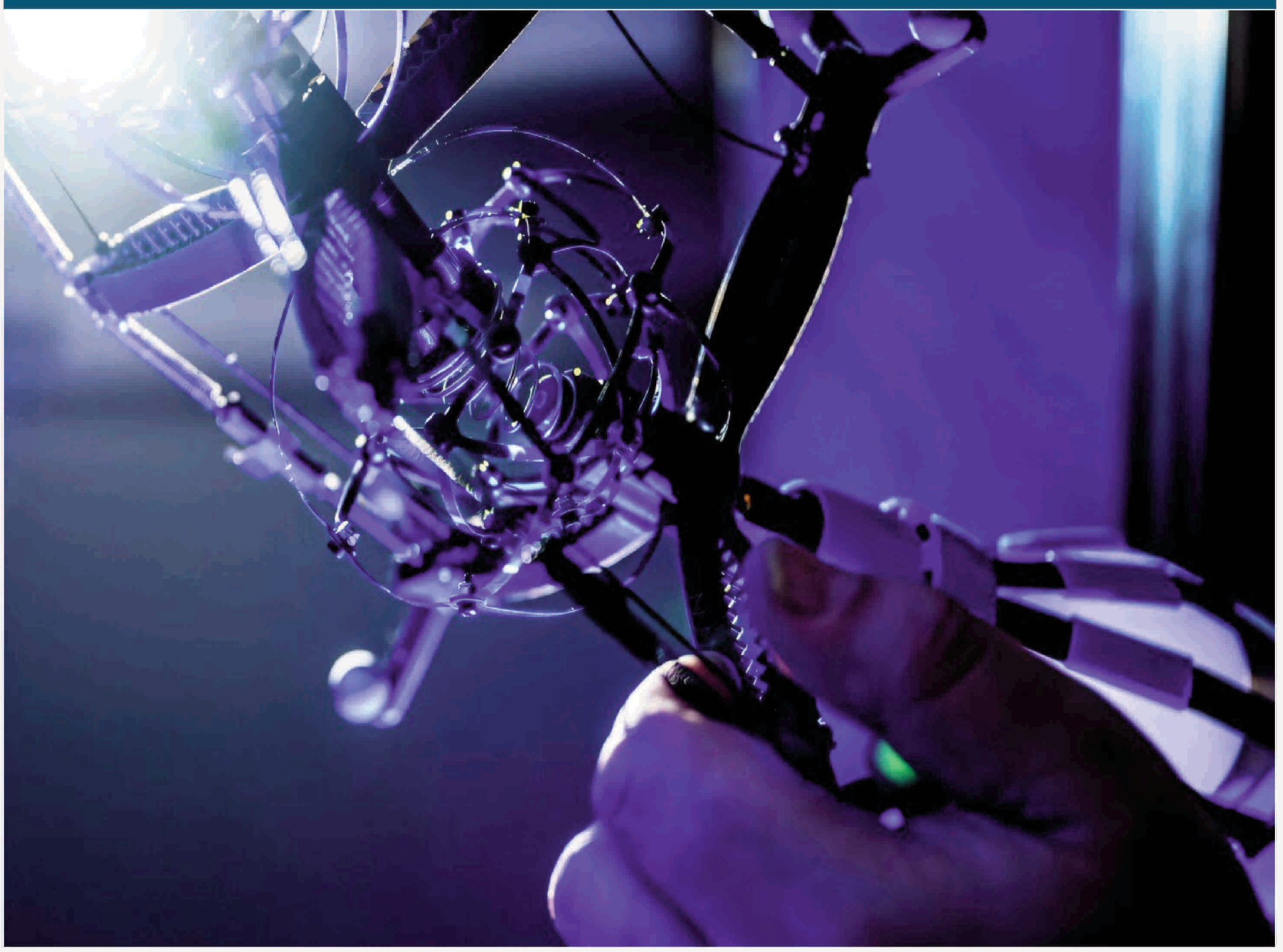
وزیرستان میں گیس اور تیل کے نئے ذخائر دریافت

یومیہ گیس کی مقدار 20.485 MMSCFD، ہلکے تیل کے ذخائر کی یومیہ مقدار 117 بیرل

پختونخوا میں اسپین وام ون کنوئیں سے دوسری بار تیل و گیس ذخائر دریافت ہوئے ہیں، خط

پاکستان کے شعبہ توانائی میں اہم پیشرفت سامنے آئی ہے، وزیرستان بلاک میں دوسرے بڑے گیس اور تیل کے نئے ذخائر کی دریافت ہوئی ہے، ماڑی انرجیز کی جانب سے پاکستان اسٹاک ایکس چینج کی انتظامیہ کو بذریعہ خط آگاہ کیا گیا ہے کہ خیبر پختونخواہ میں اسپین وام ون کنوئیں سے دوسری بار تیل و گیس ذخائر دریافت ہوگئے ہیں۔ خط میں کہا گیا ہے کہ کنوئیں سے ہلکے تیل اور گیس کا بہاؤ 3 ہزار 4 سو 31 پاؤنڈ فی مربع انچ ہے، کنوئیں سے حاصل ہونے والی یومیہ گیس کی مقدار 20.485 ایم ایم ایس سی ایف ڈی ہے، خط کے مطابق اسپین وام ون کنوئیں سے ملنے والے ہلکے تیل کے ذخائر کی یومیہ مقدار 117 بیرل ہے، خط کے مطابق وزیرستان میں کو اگزھ فارمیشن میں ماری انرجیز کا شیئر 55 فیصد ہے جبکہ او جی ڈی سی ایل کا شیئر 35 فیصد اور سینٹ پیٹرولیم کا شیئر 10 فیصد ہے۔■

Engineers develop hybrid robot that balances strength and flexibility and can screw in a lightbulb



How many robots does it take to screw in a lightbulb? The answer is more complicated than you might think.

New research from Northeastern University upends the riddle by making a robot that is both flexible and sensitive enough to handle the lightbulb, and strong enough to apply the necessary torque.

"What we found is that by thinking about the bodies of robots and how we can make new materials for them, we can actually make a robot that has the benefits of both rigid and soft robots," says Jeffrey Lipton, assistant professor of mechanical and industrial engineering at Northeastern.

"It's flexible, extendable and compliant like an elephant trunk or octopus tentacle, but can also apply torques like a traditional industrial robot," he adds.

Lipton explains that there are currently two types of robots in the world: rigid (or hard) robots and soft robots.

Rigid robots are your typical industrial robots. They start and stop automatically to perform precise tasks at great speed—and, often great danger—to humans.

"You like to put them behind cages because if they're moving fast enough to be useful, they're probably also moving fast enough to hurt you," Lipton says.

These robots are great at spinning things, capable of applying torque at a distance, Lipton says.

Soft robots, meanwhile, are bioinspired—think an elephant trunk or an octopus tentacle—and can reach and pull and interact in complex environments and around people.

"If I have a robot that's squishy like a pool noodle, it might slap me and it may sting a little bit, but it's not going to break a bone," Lipton says.

So what does this have to do with a lightbulb?

Well, a rigid machine has the necessary torque, but a soft robot has the maneuverability and flexibility to handle such a delicate task.

But in new research published in Science Robotics, Lipton has developed a hybrid hard and soft robot.

The hybrid robot works courtesy of a new material that works similar to the constant-velocity joints you find connecting a wheel to the axle of your car.

In a car, CV joints enable a wheel to move up and down and bounce around while keeping the axle in place, spinning, Lipton explains. But they are made of hard, rigid components.

"Ours, we can actually make soft and flexible and bendable," Lipton says. "It's a new type of joint, but you can pattern it and then you can make materials out of it."

It's a new approach to designing robots.

"It's all by designing the shape, and that makes us really different from most soft robots where they're focusing on changing the chemistry," Lipton says.

The approach has led to a new type of robot arm—as well as a new answer to how many robots it takes to screw in a lightbulb. -- TP

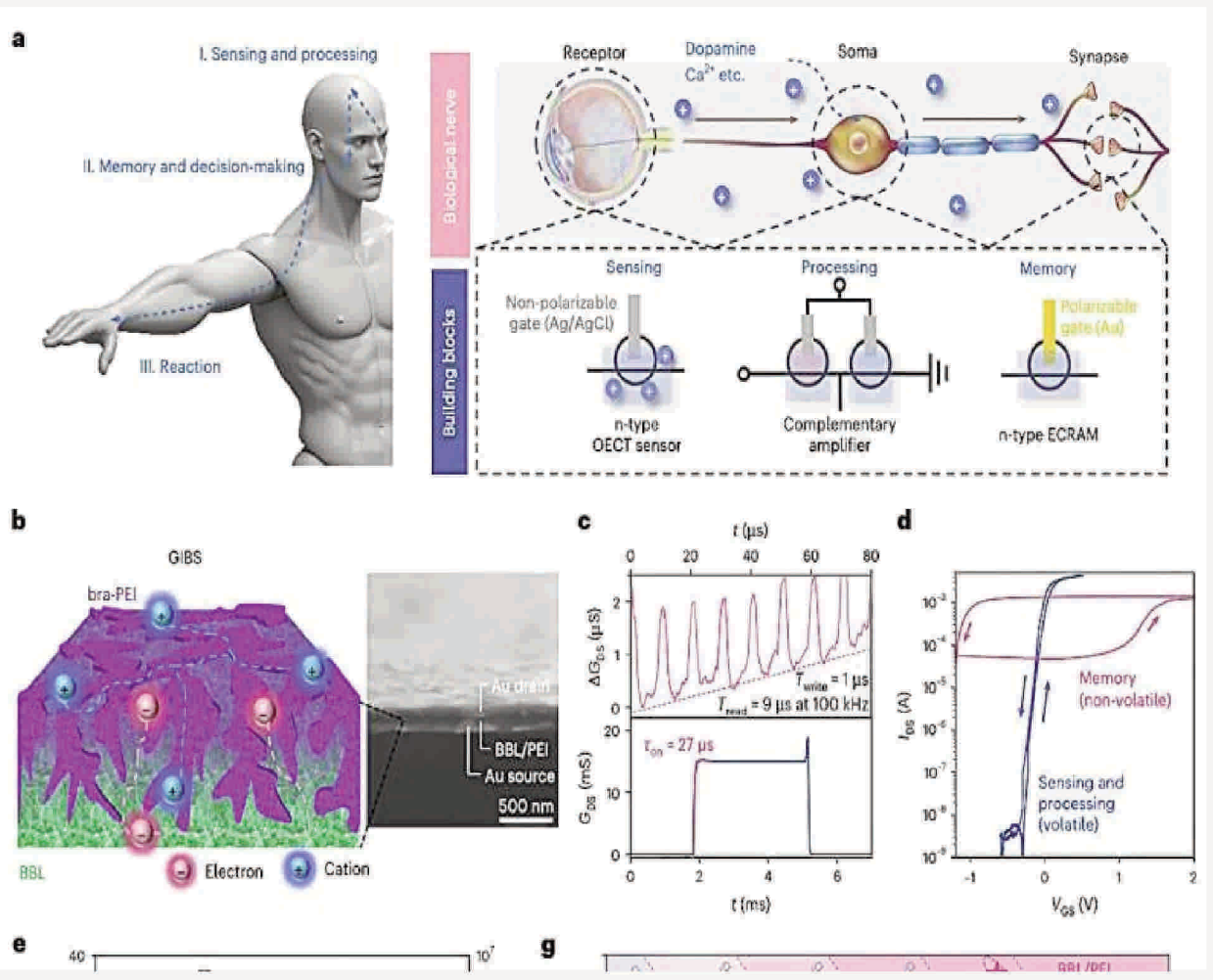
Artificial nerve with organic transistor design shows promise for brain-machine interfaces

In recent years, many engineers have been trying to develop hardware components that could emulate the functions of various biological systems, including synapses, the human skin and nerves. These bio-inspired systems include what are referred to as artificial nerves, systems designed to emulate the role of nerves in the body of humans and other animals.

Artificial nerves could be useful for a wide range of applications, ranging from systems for repairing damaged nerves to brain-computer interfaces, highly precise sensors and other advanced electronics. So far, however, the engineering of nerve-inspired systems that operate at biologically compatible frequencies and realistically replicate the function of nerves has proved challenging.

Researchers at Xi'an Jiaotong University in China and Technical University of Munich recently developed a new high-frequency artificial nerve with a unique design that optimizes the transport of ions and electrons, while also rapidly responding to signals and retaining charge-related information. This nerve-inspired system, introduced in a paper published in Nature Electronics, is based on homogenously integrated organic electrochemical transistors.

"N-type organic electrochemical transistors are a possible building block for artificial nerves, as their positive-potential-triggered potentiation behavior can mimic that of biological cells," wrote Shijie Wang, Yichang Wang and their colleagues in their paper. "However, the devices are limited by weak ionic and electronic transport and storage properties, which leads to poor volatile and non-volatile performance and, in particular, a slow response. We describe a high-frequency artificial nerve based on homogeneously integrated organic electrochemical transistors."



The artificial nerves developed by this team of researchers are based on vertical n-type organic electrochemical transistors that were sequentially deposited onto a substrate. These devices can emulate the functioning of receptors, synapses and somas in the human nervous system, ultimately producing nerve-like circuits.

"We fabricate a vertical n-type organic electrochemical transistor with a gradient-intermixed bicontinuous structure that simultaneously enhances the ionic and electronic transport and the ion storage," wrote Wang, Wang and their colleagues. "The transistor exhibits a volatile response of 27 μs, a 100-kHz non-volatile memory frequency and a long state-retention time."

Artificial nerves introduced in the past were found to excel in some domains (e.g., ionic and electronic transport, long-term memory storage, etc.), while achieving sub-optimal results in others. In contrast, the organic transistor-based system created by the researchers was found to attain both good ionic and electronic transport, as well as long-term ion storage, thus reaching beyond previously reported trade-offs.

"Our integrated artificial nerve, which contains vertical n-type and p-type organic electrochemical transistors, offers sensing, processing and memory functions in the high-frequency domain," wrote the researchers. "We also show that the artificial nerve can be integrated into animal models with compromised neural functions and that it can mimic basic conditioned reflex behavior."

To assess the potential of their artificial nerve, the researchers implanted it in mice with impaired neural functions. Their initial findings were very promising, as the system was found to be compatible with the mice's biological tissues, while also effectively mimicking conditioned nerve-supported reflexes.

In the future, this promising artificial nerve could be improved further and tested in a broader range of experiments to further assess its safety and performance. Eventually, it could be used to develop technologies for repairing nerve circuits, as well as brain-computer interfaces, such as prosthetic limbs that can be controlled by the brain, devices that allow paralyzed patients to easily communicate with others and systems to precisely monitor or manipulate brain activity. -- TP

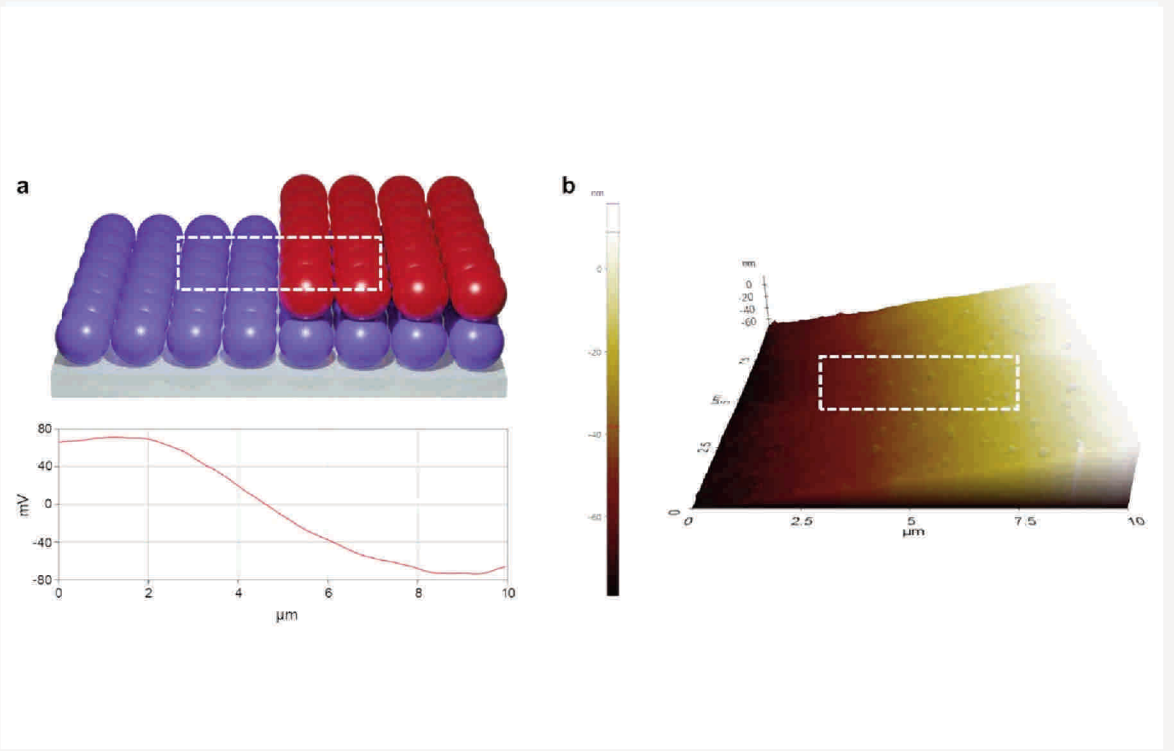
8.26% efficiency boost in eco-friendly solar cells achieved, advancing commercialization prospects

A research team has developed a technology that can significantly increase the efficiency of eco-friendly solar cells. The solar cells they developed showed increased power conversion efficiency of up to 8.26%, compared with conventional solar cells.

This finding is expected to accelerate the commercialization of next-generation eco-friendly solar cells.

The research is published in the journal Advanced Energy Materials.

Silver bismuth sulfide (AgBiS2) nanocrystals have recently attracted attention as an eco-friendly solar cell material. Existing high-efficiency solar cells contain harmful heavy metals such as lead and cadmium, causing environmental pollution, but silver bismuth sulfide has the advantage of being non-toxic and abundant in raw materials. However, its limitation is that when it exceeds a certain thickness, electricity does not flow well, causing a sharp drop in efficiency.



To solve this problem, the research team developed a thin film with a special mixed structure to allow electricity to flow better. In other words, they mixed materials to create a layer that improves the flow of electricity. The team chemically treated silver bismuth sulfide nanocrystals to give different properties (donor and acceptor) to one layer, allowing electricity to move more efficiently inside.

As a result, when they made a 65 nm (nanometer) light-absorbing layer twice as thick as the conventional ones, its performance was maintained and the efficiency of the solar cell was improved by 8.26%. This is equivalent to charging a smartphone four to five times or keeping an LED light bulb on for over two hours longer.

"This research has greatly increased the charge diffusion length by allowing the donor and acceptor to coexist in the same layer of the AgBiS2 solar cell, thus maintaining performance even in thicker layers," said Prof. Choi Jong-min of DGIST's Department of Energy Science and Engineering. "We expect this eco-friendly technology to be applied to various high-efficiency solar cells in the future."

This joint research between DGIST Prof. Choi's team and UNIST Prof. Kwon Oh-hoon's team was led by DGIST Energy Science and Engineering students Kim Hae-jung and Park Jin-young, and UNIST combined Master's and doctoral program student Choi Ye-jin.■