MONTHLY JANUARY 2025 ISSN 2309-6578

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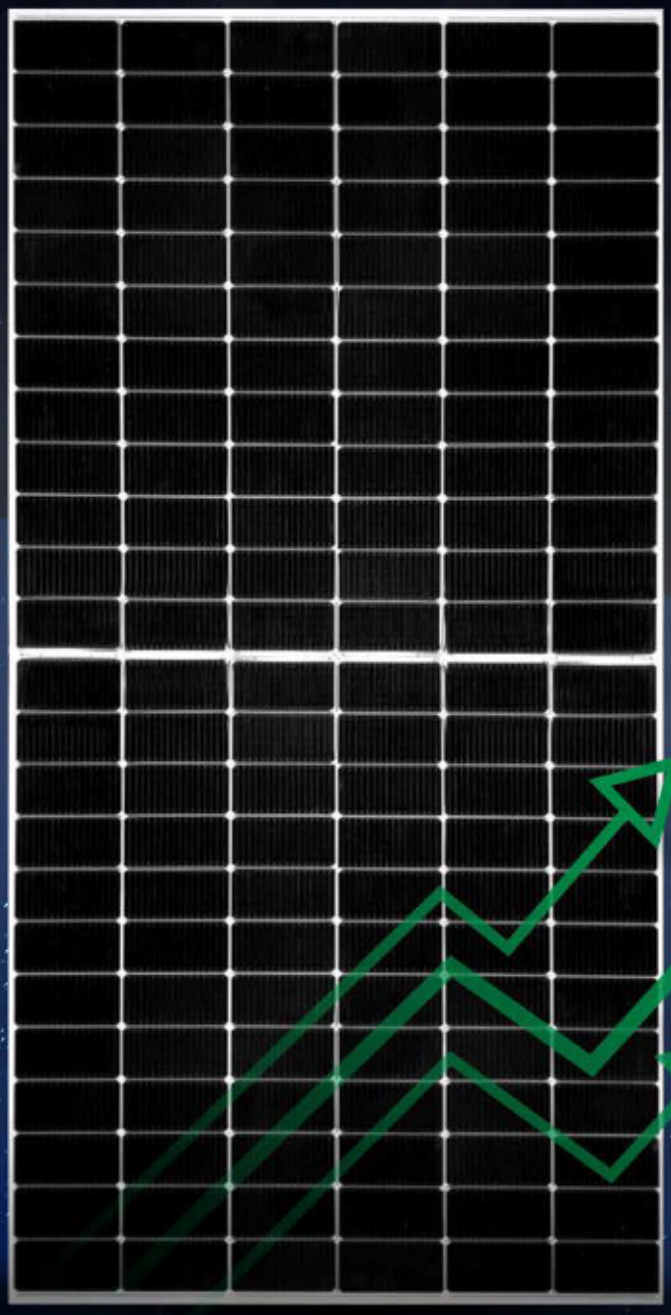

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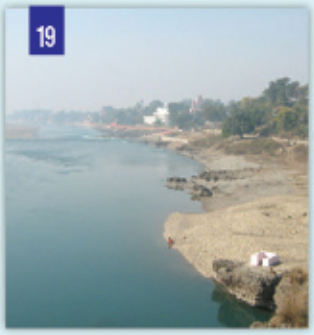

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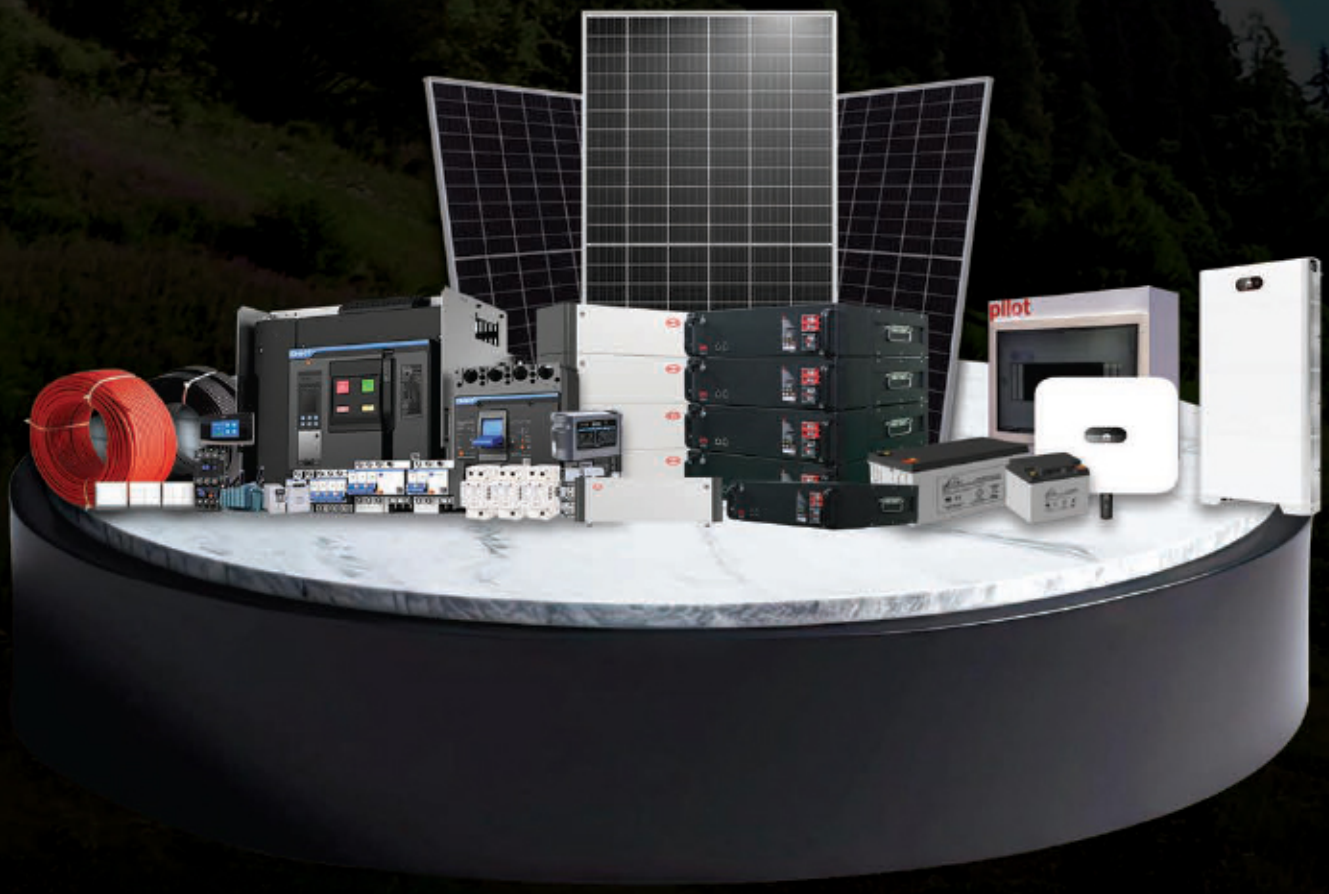

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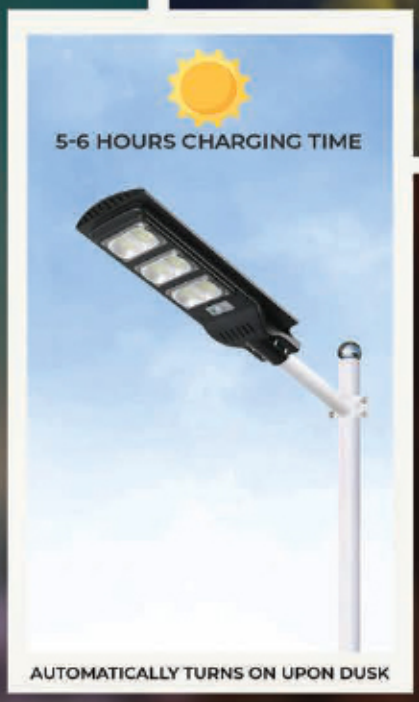

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FROM THE

Editor's desk...

Govt economy up, people's economy down the drain

While the Pakistan government claims to have managed to improve its economy to some level, but it should not forget that it all came as a result of imposing unjustified heavy taxes on people and raising oil and gas prices time and again, leaving common people to face worst shortfall in their household budgets and compelling business class people to face worst-ever financial losses, retrench staff and raise prices of commodities for survival.

According to a State Bank report, Pakistan's real GDP growth rate for 2022 was 6.2%, which declined to 2.5% in 2024, making a big fall. As per the SBP report, GDP growth rate is expected in the range of 2.5-3.5% in fiscal year 2025. Hence, reaching 2022 GDP level requires more than doubling efforts to get 3.7% more growth.

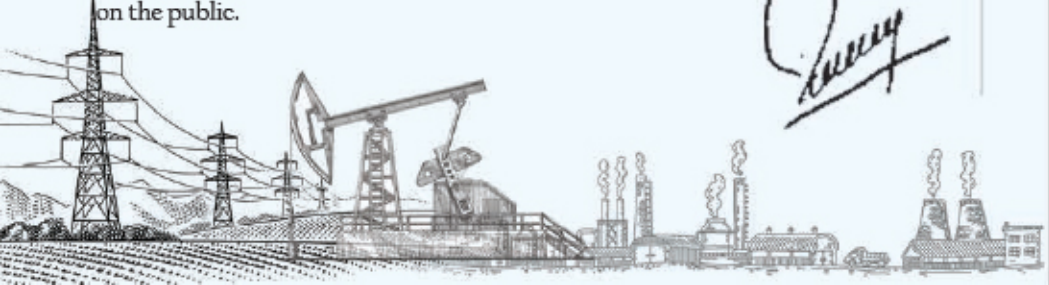
While inflicting forced taxes and high oil, gas and power prices on people, no solid step was taken to stop corruption, reduce government expenses on use of extra vehicles including luxury ones, and abolish free electricity & petrol being provided to bureaucrats. Furthermore, no significant progress was made to stop tax theft and bring more businessmen to the tax net. Electricity theft was also not stopped to desired level and instead power rates were raised to historical highs. The winter power package of three months seems to be complex one as people have been asked to use more and more electricity during this period and get discount of upto 18-50%. However, its benefit is yet to be seen after making calculations.

The fact is that the government has improved only its own economy which too is still low. Another biting fact is that people's economy is still in the worst state as the prices of food, gas and oil continue to skyrocket and are out of people's reach with no signs of decline in near future. The people have taken loans from banks and other people to manage the livelihood of their children.

The price of farm eggs in Pakistan was Rs103 per a dozen in 2018, which has now jumped to more than Rs300, a 200% rise. During this period, the prices of milk, rice, poultry, flour, cooking oil and medicine have jumped to almost 300%. Hence, making big claims of reduction in inflation does not match with the above mentioned prices. However, there is some reduction in vegetable and fruit rates, which is not sufficient to provide relief to the public.

The inflation has disproportionately affected the middle class and the poor segment of the society, who spent a larger portion of their income on essentials. As prices rose unabated, the real income of these groups have decreased with a big margin, pushing them into poverty. Domestic issues such as energy shortages, poor infrastructure, and political instability have disrupted supply chains, pushing prices higher. There is a need to compare inflation with a gap of at least six years rather than a short period comparison because people have suffered too much in the era from 2018 to 2024-25. The rising prices of essential goods and services, including food, fuel, and healthcare, have significantly increased the cost of living, making it difficult for families to meet their basic needs.

Inflation in Pakistan is a complex issue with deep-rooted causes and unbearable impacts on the public. While short-term measures can provide some relief, addressing the underlying economic problems requires comprehensive and consistent policy reforms. Improving economic stability, enhancing production capacities, and ensuring efficient governance are crucial steps toward mitigating inflation and its adverse effects on the public.



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The Future of Solar Energy in Pakistan

Insights from Chairman of Pakistan Solar Association

Waqas Moosa

Chairman PSA

Pakistan's solar energy sector is experiencing a transformative period, driven by both opportunities and challenges. In an exclusive interview, Mr. Waqas Moosa, Chairman of the Pakistan Solar Association (PSA), sheds light on critical issues affecting the industry, including import dynamics, government policies, industry support, quality control, and the future direction of the national energy mix.

Impact of Excessive Imports on Market Dynamics and Pricing

The influx of imported solar equipment in Pakistan has reshaped local market dynamics significantly. On one hand, increased competition has made solar energy more accessible and affordable for consumers and businesses, driving down prices and boosting adoption. However, this trend also brings challenges. Many imported products are of inconsistent quality, often dominated by lower-standard equipment, which can undermine long-term reliability and performance.

Furthermore, heavy reliance on imports places local manufacturers at a disadvantage, hindering the establishment and growth of domestic production capabilities. The key to balancing this dynamic lies in effective regulation of imports. By keeping in view the demands of the local market, while maintaining competitive pricing and ensuring product quality, we can create a more robust and sustainable market.

Current State of Pakistan's Solar Industry: Growth Trends and Government Policies

Pakistan's solar industry has seen impressive growth, spurred by increasing energy demand and a national push towards renewable solutions. Double-digit growth rates are evident, with both large-scale projects and residential installations contributing to this upward trend. Government policies, such as net metering and tax incentives, have played a pivotal role in fostering this growth.

However, the industry still faces challenges due to inconsistent policy implementation and abrupt changes in import duties and taxation. These fluctuations create uncertainty and can deter potential investors. For the sector to continue its growth trajectory, it is crucial for the government to establish stable, long-term policies and streamline regulatory processes. Such stability will encourage investment, innovation, and confidence within the industry.

Navigating the Energy Demand-Supply Imbalance and Capacity Payments

A critical issue facing Pakistan's energy sector is the growing gap between committed electricity supply and actual demand, exacerbated by substantial capacity payments owed to power producers. Addressing this requires a strategic shift towards increasing electricity demand while reducing dependence on other energy sources like gas and petrol.

Several solutions can help achieve this:

Rationalizing Gas Prices: By removing subsidies and increasing gas prices, con-

sumers will naturally shift towards electricity, which is increasingly abundant and underutilized.

Accelerating Electric Vehicle (EV) Adoption: Converting motorcycles, rickshaws, and cars to electric should be a priority. This transition can be driven by maintaining high petrol prices and removing duties on charging equipment, without the need for subsidies.

Grid-Level Battery Storage: Incorporating large-scale battery storage solutions into the national grid can help smooth out the intermittent nature of solar power and better manage distributed generation.

Given the structure and timing of power plant investments, the nation is already locked into significant capacity payments. Therefore, it makes economic sense to maximize electricity consumption. Ironically, higher consumption can also help control electricity costs by distributing fixed charges across a larger base.

The Crucial Role of Solar Energy in Pakistan's Future

Solar energy will play an indispensable role in this new energy mix. Regardless of individual policy preferences, the transition towards solar is inevitable due to its cost-effectiveness, scalability, and environmental benefits. Leveraging the rise of solar power can help Pakistan capitalize on its abundant sunlight and reduce reliance on fossil fuels.

By embracing solar and integrating it with innovative solutions like EVs and battery storage, Pakistan can address its energy challenges more sustainably. This strategic shift not only ensures energy security but also paves the way for a cleaner, more resilient future.

How PSA Supports Industry Members and the Role of Government in Sustainable Growth

The Pakistan Solar Association (PSA) actively supports its members by providing advocacy, industry insights, and training programs. We collaborate with policymakers to address industry challenges and promote best practices. However, sustained growth requires coordinated efforts from all stakeholders:

Stable Policies: Long-term, consistent policies to encourage investment.
Financial Support: Strategies to make solar solutions accessible by the masses.
Quality Regulation: Strengthening standards to ensure fair competition.

Conclusion

Pakistan's energy future hinges on bold, strategic choices. By reducing gas and petrol consumption, promoting electric mobility, and embracing solar power, we can optimize our existing infrastructure and mitigate the burden of capacity payments. With collaboration between the government, industry stakeholders, and regulatory bodies, the solar sector will lead Pakistan into an era of sustainable growth and energy security.

The future of solar energy in Pakistan is bright, and now is the time to harness its full potential. ■

SOLAR TECHNOLOGY

China's Solar Great Wall Could Power Beijing And Beyond

Holly Large

A desert might not be the first place you'd expect to be a hive of activity, but northwestern China's Kubuqi Desert is currently bucking the trend, as an ambitious project to build a "Solar Great Wall" continues to transform the desolate landscape.

Once completed – expected to be sometime in 2030 – the solar farm will be 5 kilometers (3 miles) wide and stretch for 400 kilometers (250 miles) across the sand. That might seem quite short in comparison to the 21,196-kilometer (13,171-mile) Great Wall of China, but its greatness aims to come from power rather than length.

The maximum generating capacity of the farm is expected to be 100 gigawatts, with 5.42 gigawatts having been installed so far, according to state-owned newspaper China Daily. That capacity will come courtesy of millions of solar panels, soaking up the desert's estimated 3,100 yearly hours of sunshine. It's hoped that upon completion, the vast solar power plant will generate enough electricity to power the country's capital city, Beijing.

According to China Daily, Beijing consumed 135.8 billion kilowatt hours (kWh) of electricity in 2023. It's expected that the farm will generate around 180 billion kWh of electricity by 2030; if the capital city's energy demands don't stray much further than they are currently, that would be enough to power not just Beijing, but its surrounding areas too. It's also far more than the annual generation of the world's largest solar farm (also in China), which stands at a comparatively measly 6.09 billion kWh per year.

China is currently the world's largest emitter of greenhouse gases, having pumped out 10.8 billion tons of carbon dioxide in 2021. In the Dalad Banner, where part of the Solar Great Wall is being built, it's estimated that the solar farm could reduce carbon emissions in the region by around 31.3 million tons, Li Kai, an official with the energy administration of Dalad Banner, told China Daily.

It's also hoped that the solar farm will contribute to ongoing greening and the prevention of further desertification of the Kubuqi Desert, with the project administration aiming to treat nearly 27 million hectares (67 million acres) of desert. This could happen by the solar panels "fixing" the sand, acting as a break for winds that would otherwise allow dunes to move, and providing shade for plants to grow. ■

Transformation of Power Sector
Challenges and Pathways to Sustainability

Mustafa Tahir

Writer is Deputy Editor of Energy Update

The recently published State of the Industry Report 2024 by the National Electric Power Regulatory Authority (NEPRA) offers a comprehensive analysis of Pakistan's electric power sector. It underscores systemic inefficiencies, escalating costs, and governance challenges that are crippling the nation's energy infrastructure.

The Crisis of Underutilized Capacity

Despite having an installed generation capacity of 45,888 MW, Pakistan only utilized 33.88% of this during FY 2023-24. This underutilization stems from structural flaws, including transmission bottlenecks and inadequate demand management. Consumers are forced to pay for unutilized capacity, further driving up electricity costs. NEPRA estimates that 66.12% of the installed capacity remains idle, significantly burdening end-users.

Transmission and Distribution Losses

Transmission and distribution (T&D) losses, recorded at 18.31%, exceeded the permissible limit of 11.77%. These losses added Rs276 billion to the growing circular debt, which now stands at an alarming Rs2,393.37 billion. Recovery rates from consumers are also suboptimal, with only 92.44% of billed amounts collected, resulting in an additional Rs314.51 billion in losses.

Circular Debt and Governance Issues

The report highlights the deepening circular debt crisis, which threatens the financial stability of the power sector. Inefficient power distribution companies (DISCOs) and governance lapses are key contributors. With receivables from DISCOs soaring to Rs2,320.88 billion, NEPRA stresses the need for governance reforms and stricter accountability mechanisms.

Shifting Toward Renewables

Encouragingly, renewable energy (RE) integration, particularly through solar net metering, is gaining traction. As of June 2024, over 156,372 distributed generation facilities with a capacity exceeding 2,200 MW have been connected to the grid. However, challenges such as load-shedding, policy uncertainty, and infrastructure gaps impede the full potential of RE.

Proposed Interventions for Sector Revival

NEPRA's report emphasizes several measures to address the crisis:

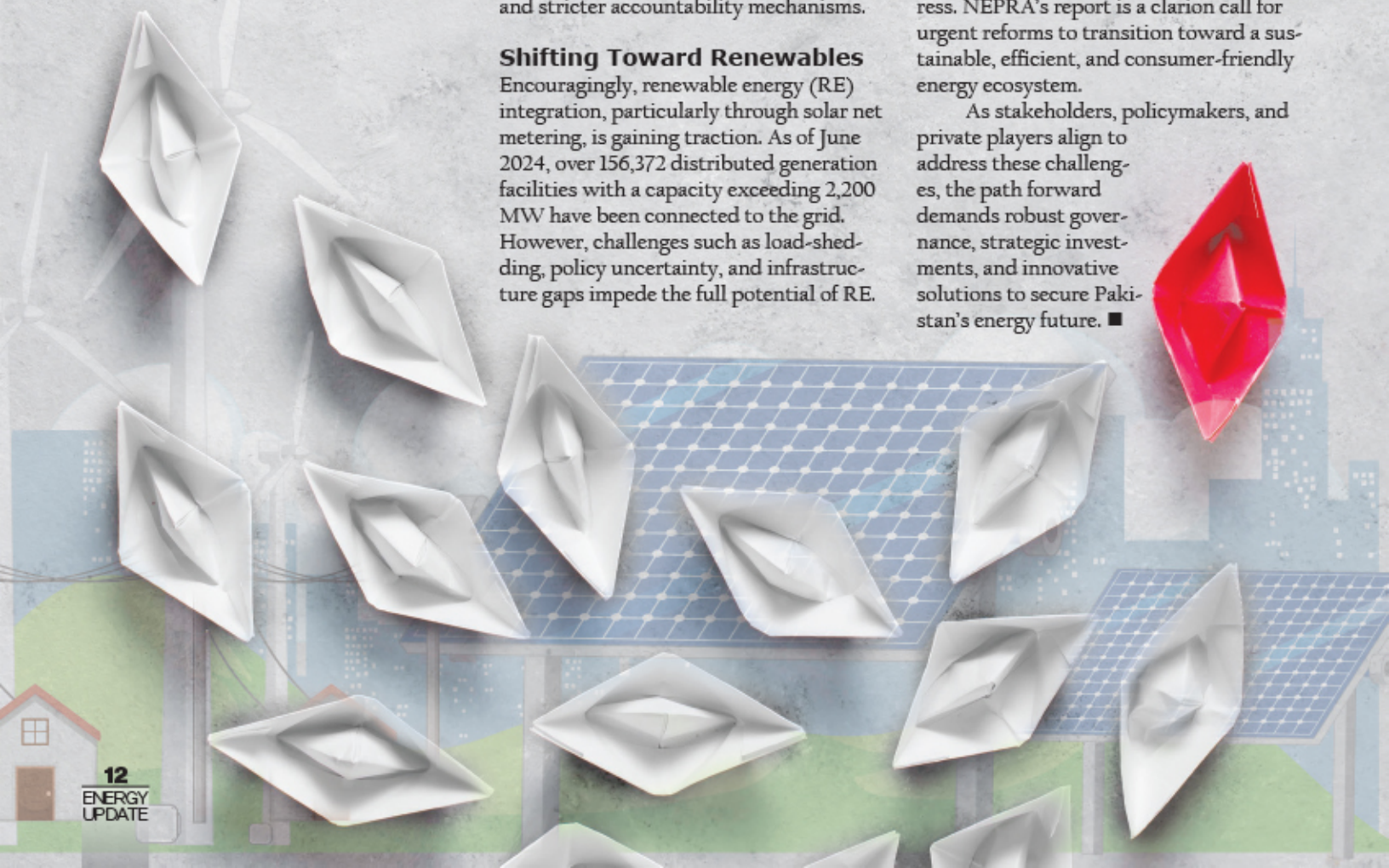
Optimizing Existing Capacity: Leveraging local resources, improving transmission infrastructure, and enhancing grid stability. Reforming Tariff Structures: Aligning tariffs with actual costs and incentivizing higher electricity consumption to reduce unit costs.

Strengthening Governance: Streamlining DISCO operations, enforcing commercial contracts, and tackling electricity theft. Scaling Renewable Energy: Expanding investments in solar and wind energy while addressing grid connectivity challenges. Reducing Supplementary Charges: Lowering taxes, surcharges, and fees to make electricity more affordable.

A Call to Action

The power sector remains the backbone of Pakistan's economy, directly influencing industrial productivity and social progress. NEPRA's report is a clarion call for urgent reforms to transition toward a sustainable, efficient, and consumer-friendly energy ecosystem.

As stakeholders, policymakers, and private players align to address these challenges, the path forward demands robust governance, strategic investments, and innovative solutions to secure Pakistan's energy future. ■



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Carbon Credits: A Blessing to Tackle Climate Change

Pakistan's federal cabinet has recently approved policy guidelines for carbon market trading, which are a laudable act; practical and result-oriented steps are needed to materialize this environment-friendly decision; carbon markets can create a financial incentive for companies and countries to invest in clean technologies and projects that reduce carbon emissions.

Muhammad Naeem Qureshi

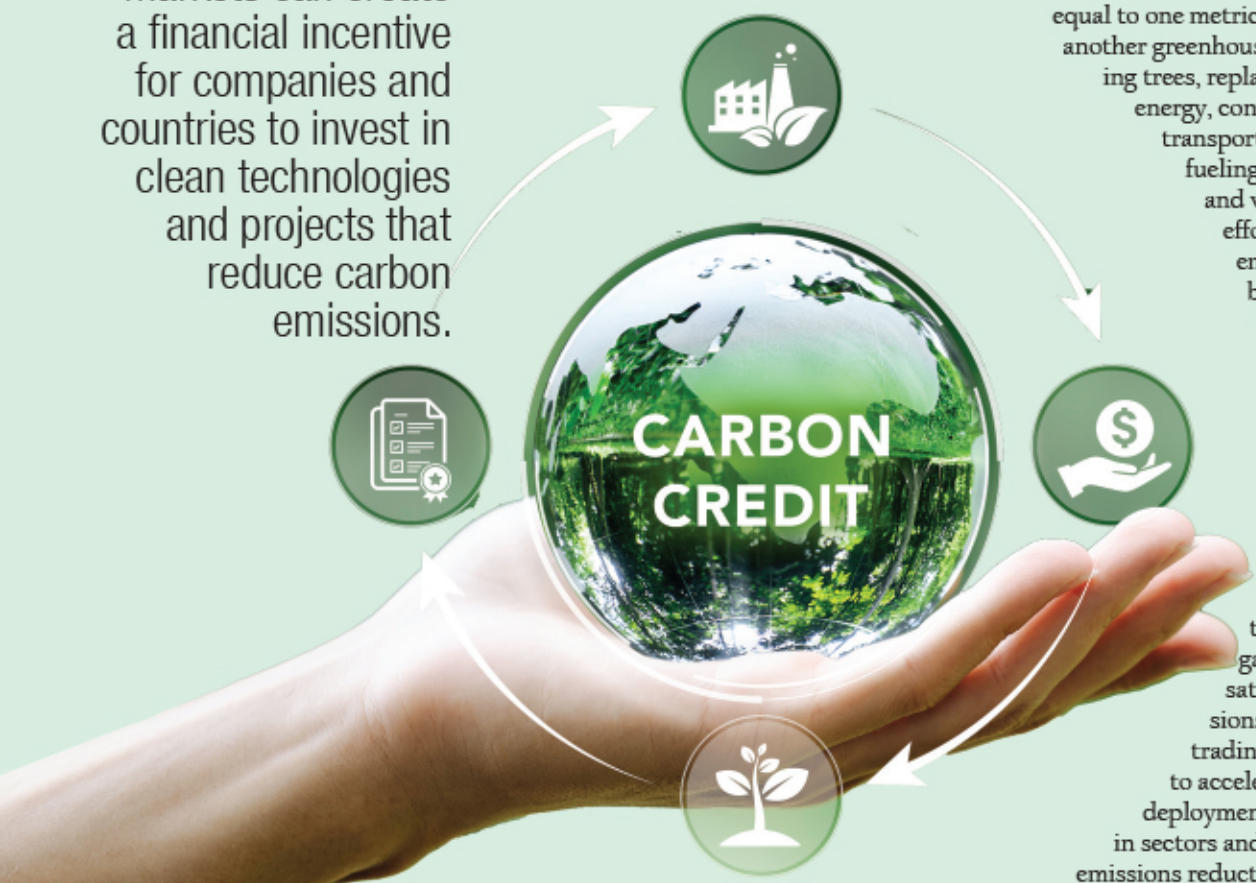
Writer is Managing Editor of Energy Update

Pakistan's federal cabinet has recently approved policy guidelines for carbon market trading on recommendations of the Ministry of Climate Change and Environmental Coordination, which will help generate enormous money and reduce carbon emissions in the shape of carbon credits. The approval is a landmark act in the country's history of climate change tackling efforts. But the fact is that practical and result-oriented steps are needed to materialize this decision.

The development in Pakistan's climate sector comes as countries reached a deal at the recent COP29 climate conference held in Baku. They agreed on rules for a global market to buy and sell carbon credits through robust projects that could help reduce carbon emissions.

Furthermore, Pakistan's Climate Change has also developed a strategy to access Voluntary Carbon Markets and prepare for generating carbon credits and emission trading. A Climate Finance & Carbon Credit Unit is also proposed to be established in the country to develop access to carbon markets and other sources of climate finance. This strategy is also a good one, but the more good will be when this all is materialized and robust results are achieved. The hollow slogans about mitigating climate change must come to an end now. As no result-oriented work in this regard has so far been done.

In carbon trading, one carbon credit is equal to one metric ton of carbon dioxide or another greenhouse gas reduced by planting trees, replacing fossil fuels by clean energy, converting smoke-emitting transport into electrical vehicles, fueling industries with solar and wind energies, and other efforts reducing carbon emissions. However, carbon credits are expected to be more expensive and scarce due to rising demand and higher supply costs. By 2035, the price of credits could be between $80–$150 per tonne.



Countries, companies or individuals can purchase carbon credits that reduce greenhouse gas emissions to compensate for their own emissions. Through the carbon trading policy, Pakistan needs to accelerate clean technology deployment and attract investment in sectors and projects with significant emissions reduction potential, including

energy, agriculture, waste management, and forestry. The government should ensure that carbon markets drive real, verifiable reductions while generating substantial economic and social co-benefits across Pakistan.

By launching this policy, Pakistan signals its readiness to engage in global carbon markets, inviting both domestic and international partners to join us in advancing a resilient, low-carbon economy with strong accountability and impact at its core.

Some governments and companies may struggle to reduce their planet-warming greenhouse gas emissions to meet their climate targets. Supporters of carbon offsets see them as a key means to help meet these goals. These offsets allow one nation or company to offset some of their emissions by paying for actions to cut emissions elsewhere. These actions might include rural solar panel installations or converting a fleet of petrol buses to electric.

The Paris Agreement helps countries work together to reduce their carbon emissions. Its Article 6 sets out two options for countries and companies to trade offsets, helping them meet the goals they set to reduce planetary-warming gases in their climate action plans, known as nationally determined contributions (NDCs).

By trading carbon credits, countries can aim to meet their climate action goals in a financially efficient manner. A carbon market operates as a platform where nations or corporations can buy or sell carbon credits, which are essentially certificates for the reduction of greenhouse gas emissions. The central idea is to incentivise emission reductions through market dynamics.

Carbon markets can have two broad formats: cap-and-trade systems and carbon offset markets. The former involves governmental limits on emissions, with entities being allocated or purchasing emission allowances. If an entity's emissions are below these allowances, they can sell the surplus. In contrast, carbon offset markets allow organizations to fund carbon reduction initiatives in other sectors or nations to balance out their emissions.

The United Nations allows countries a certain number of credits, and each nation is responsible for issuing, monitoring, and reporting its carbon credit status annually. Governments allow companies to emit a set amount of GHGs before needing to purchase credits. If emissions exceed limits, they are required to buy credits. If a company purchases too many credits, it can sell the excess on a carbon exchange or marketplace. This system is commonly called a cap-and-trade program.

Cap-and-trade programs remain controversial in the United States, but 13 states have adopted such market-based approaches to reducing greenhouse gases, according to the Center for Climate and Energy Solutions. Eleven of them are Northeast states that banded together to jointly attack the problem through a program known as the Regional Greenhouse Gas Initiative.

Pakistan's carbon markets are designed to attract substantial investment, both domestic and international, into low-emission development projects. By facilitating carbon credit issuance and trading, we are creating market

incentives for more investment in emission reduction projects. At the heart of Pakistan's Carbon Market Policy Guidelines is an unwavering commitment to social inclusion, equity, and benefit sharing. Our approach recognizes that the journey toward a sustainable, low-emission future must be both inclusive and just.

To benefit from Pakistan's carbon trading policy, entities and organizations need to take several key steps to ensure they comply with the regulations and effectively participate in carbon markets. There is a need to familiarize yourself with the details of Pakistan's carbon trading policy, including its goals, mechanisms, and the regulatory framework established by the government. It will be good to identify which industries or sectors are eligible to participate in carbon trading, such as energy, manufacturing, and agriculture.

Once eligible, register with the relevant regulatory body, such as the Pakistan Environmental Protection Agency (EPA) or a designated carbon exchange. While applying for carbon credits, there is a need to submit documentation detailing the emission reduction projects you have undertaken to earn carbon credits.

Once you have successfully reduced emissions and accumulated carbon credits, you can sell them on the carbon exchange or trade them with other organizations looking to offset their emissions. If your emissions exceed your allocated limit, you can also purchase carbon credits from other organizations to comply with the policy.

There is a need to regularly monitor emissions' reductions and ensure that all activities align with the carbon trading commitments. It will also be good to comply with reporting requirements besides providing annual reports on emission reductions to the regulatory authorities.

Carbon trading markets can provide a lower-cost way to reduce emissions. They can help shift emissions reduction activities to where they are most cost effective. They can mobilize private sector investment in climate change mitigation. Carbon markets can create a financial incentive for companies to invest in clean technologies and projects that reduce emissions. They can promote international cooperation on climate change and provide a platform for countries to work together to reduce emissions on a global scale.

Pakistan has a number of natural assets that can be used to generate carbon credits, including its extensive mangrove forests, its potential for renewable energy development, and its opportunities for energy efficiency improvements. The country is also home to a number of organizations that are working to develop and implement carbon credit projects. The Sindh Forest Department is currently the only seller of carbon credits in Pakistan. The department has two projects, the Delta Blue Carbon (DBC-1) and DBC-2 projects, which are focused on restoring and planting mangrove forests in the Indus Delta.

There are several challenges in carbon market trading that include lack of standardization, bilateral cooperation between two parties, transparency and threat of corruption. Without clear standards for carbon credits, it can be difficult for companies to know whether they are truly reducing their emissions. Carbon dioxide emission taxes, prices, and markets have long been advocated as crucial tools in the fight against global warming. The idea is that by putting a price on carbon emissions, polluters will have a financial incentive to reduce their greenhouse gas output, thus curbing climate change. However, despite these intentions, carbon markets have faced significant criticism and have been deemed ineffective in achieving their objectives.

The impacts of climate change are already being felt around the world and the clock is ticking to keep global warming to safe levels. The countries and the companies must compensate for extra emissions by urgently financing action outside their value chain, alongside reducing their footprint according to science, to ensure reaching the global net zero. ■

Huawei Honors Top Partners at ME&CA Regional Summit

Mustafa Tahir

Huawei recently hosted a prestigious summit for its Shanghai, Middle East, and Central Asia (ME&CA) region, showcasing the remarkable achievements and performance milestones of 2024. The event brought together key industry players to celebrate innovation, collaboration, and excellence in renewable energy solutions.

In a proud moment for Pakistan, Bahum was honored with the Special Contribution Partner Award – 20 million Club, the only recipient of this accolade across the ME&CA region. The award was presented to Bahum's CEO by Mr. Yang Yougui and Mr. Xing Qing, marking a significant achievement in advancing sustainable energy solutions.

Two other notable honorees were AE Solar and Diwan, recognized with the Special Contribution Partner Award – 5 million Club, reflecting their exceptional contributions to the solar energy sector.

Huawei also celebrated several other outstanding partners for their pivotal roles in driving innovation and business development. Among the honorees were two Tier-2 partners and two EPCs, recognized with awards such as the Special Contribution Partner Award – 2 million Club, Best Marketing Development Partner, and Best BESS Project Breakthrough, among others.

The summit highlighted Huawei's commitment to fostering partnerships and driving transformative progress in the renewable energy landscape, reaffirming its leadership in the ME&CA region.

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Revamping IPPs: lessons from international practices

Dr Ghulam Mohey-Ud-Din

Pakistan's energy sector has long been a key contributor to the country's economic growth and development, but it remains surrounded by chronic challenges such as inefficiencies, world-high costs, and frequent load-shedding. Among all these challenges, the conundrum of Independent Power Producers (IPPs) remains central. This IPP crisis is rooted in structural inefficiencies, financial mismanagement, and contractual disputes.

If the crisis in not resolved, it can not only threaten the sustainability of the Pakistan's energy supply but also the overall macroeconomic stability. Government and policymakers must prepare a well-thought-out plan with a mix of some immediate fiscal reforms as well as corrective reforms to address this conundrum.

This issue is a result of a complex interplay between policy decisions of the 1990s and subsequent evolution of the energy sector. At its core, the crisis stems from power purchase agreements (PPAs) that guaranteed high returns to IPPs, often indexed to the US dollar. While these agreements were initially intended to attract much-needed foreign investment, they have since led to ballooning capacity payments, exacerbating the country's circular debt.

The circular debt— combined gas and power sector circular debt— now exceeding Rs 5 trillion, represents the debt owed by the government to power producers and distributors. This debt has led to liquidity issues for IPPs, delaying payments and causing a cascade of financial stress across the sector. The inability to resolve these issues has resulted in a lack of investment in new infrastructure and frequent power outages, which stifle economic growth.

The Pakistani government has taken steps to address the intensified controversy surrounding Independent Power Producers (IPPs), driven by concerns over high electricity generation costs and unfavorable contractual agreements. In response, the government initiated an investigation into allegations of "additional profiteering" among IPPs, particularly those linked to the China-Pakistan Economic Corridor (CPEC). The Power Division also clarified that discussions were ongoing, and no unilateral actions would be taken without consensus.

Revised PPAs inked with about one dozen IPPs

The Senate Standing Committee on Power also conducted a thorough review of these agreements, including a forensic audit to ensure transparency and accountability.

Recently, according to some news reports, 17 Independent Power Producers (IPPs) have reached an agreement on a hybrid 'take and pay' model amicably after more than two weeks of extensive and hard negotiation. This comprehensive approach reflects the government's effort to balance legal obligations with the pressing need to reduce electricity costs for consumers, with potential implications for Pakistan's energy sector.

Other than the above-mentioned immediate measures taken by the government, the IPP crisis in Pakistan can benefit from adapting several international best practices. Drawing lessons from South Africa, Pakistan might consider renegotiating existing power purchase

agreements (PPAs) with IPPs to balance profitability and consumer affordability. South Africa's approach involved extending contract terms while lowering tariffs, which could offer a sustainable financial model for Pakistan without forcing IPPs to incur losses.

Additionally, the community ownership model used in Denmark, where local groups own wind farms, could be adapted to Pakistan. This model reduces the burden on the national grid, lowers transmission losses, and supports local economic development.

India's UDAY scheme, aimed at reforming distribution companies by improving operational efficiency and restructuring debt, suggests that Pakistan could also benefit from restructuring its power distribution sector. Furthermore, adopting transparent forensic audits, as seen in the Philippines and Nigeria, could enhance accountability in Pakistan's power sector. Engaging independent international auditors could bolster the credibility of these audits.

Germany's successful Energiewende, which emphasizes transitioning from fossil fuels to renewable energy, provides another valuable lesson. By accelerating its shift towards renewable sources like solar and wind, and offering incentives for such investments, Pakistan could reduce its reliance on costly fossil fuel-based power. Moving away from an over-reliance on thermal power plants by investing in renewable sources such as hydropower, wind, and solar can reduce vulnerability to international price shocks. This requires substantial infrastructure investment and regulatory support for renewable projects.

In addition to renegotiation and addressing inefficiencies, improving governance and regulatory oversight is essential. Strengthening institutions like the National Electric Power Regulatory Authority (NEPRA) to enforce transparent tariff setting and monitoring of IPPs is crucial. This could further streamline decision-making and enhance policy implementation, addressing long-standing inefficiencies. Furthermore, innovative financial solutions are needed to tackle the circular debt issue. ■

Courtesy Business Recorder

Chenab River: India's Emerging Power Corridor

India has already completed 11 dams on this river; construction has recently begun on two new controversial hydropower projects

By Zafar Watto

The Chenab River is rapidly transforming into India's hydroelectric power corridor, with over 70 hydropower projects in various stages of development. The electricity generated from these projects is expected to surpass the combined output of Pakistan's Mangla and Tarbela dams.

India has already completed 11 dams on the Chenab River, including the Salal and Baglihar Dams. Recently, construction has begun on two new controversial hydropower projects—Keeru (624 MW) and Kwar (540 MW)—both of which violate provisions of the Indus Waters Treaty (IWT).

Currently, 24 more dams are under construction on the Chenab, with an additional 190 projects in the pipeline, undergoing feasibility studies or approval by India's Lok Sabha and Cabinet Committee.

India's Central Water Commission recently observed increased water flow in the Chenab, attributed to glacial melting due to climate change. This additional water supply has increased the operational capacity of new hydropower plants in Indian-occupied Kashmir by 25%. However, Pakistan is receiving less and less water at the Marala headworks annually.

Disruption of Chenab's Natural Flow

Before the Indus Waters Treaty in 1960, the Chenab brought approximately 26 million acre-feet of water to Pakistan annually. However, with India's extensive hydroelectric developments, the river's natural flow has diminished significantly, raising concerns about its ecological and social impact.

The Chenab, spanning a relatively short length of 500-600 kilometers in India, is now heavily regulated. In Himachal Pradesh alone, over 50 hydropower plants are being built within a mere 100-kilometer stretch, averaging one plant every two kilometers. In Jammu and Kashmir, larger dams are under construction, with a combined electricity generation capacity of 9,000 MW—equivalent to Pakistan's entire hydropower output.

The Keeru hydropower project (540 MW), located near the villages of Patnaki and Keeru, and about 42 km from Kishtwar, involves a 135-meter-tall concrete gravity dam. Similarly, the 624 MW Kwar project, built under the run-of-river scheme, is expected to commence electricity generation by 2025.

Pakistan's Concerns

While Pakistan does not oppose run-of-river projects in principle, it objects to India's excessive water storage capacities, which exceed treaty limits and restrict downstream flow. Furthermore, India's designs often lack critical low-level outlets and feature elevated spillways, further obstructing water flow to Pakistan.

Under the IWT, Pakistan has the right to review project designs, but India often delays or provides incomplete information, leaving Pakistan with insufficient time to respond. Moreover, Indian authorities deny Pakistani inspection visits before or during project construction, another violation of treaty clauses.

India's Stance

India dismisses Pakistan's objections as baseless, arguing that its projects generate electricity without diverting the Chenab's flow. It claims that natural geographical barriers, such as the Pir Panjal mountain range, make it technically infeasible to redirect the river's water elsewhere.

However, advancements in tunneling technology now allow water to be routed beneath the Pir Panjal range. While expensive, this option is technically viable, making Pakistan's vigilance over its water rights all the more critical.

The Way Forward

Remaining silent on India's hydropower projects risks forfeiting Pakistan's rightful share of the Chenab's water. Pakistan must expedite the development of its remaining water resources and assert its treaty rights. Strong diplomatic efforts and technical countermeasures are essential to safeguard its water and energy security. ■

Brand and new products launch event

DYNESS showcases Six Cutting-Edge Energy Storage Products

Khalid Iqbal

Dyness brand and new products launch event was held on 22nd December in Lahore, which was jointly organized by Dyness and its local distributor Innovo. Dyness officially introduced six advanced energy storage products, marking the commencement of its strategic expansion into the Pakistani market. Themed "Encounter Dyness", the event garnered widespread attention from industry partners, technical experts, and mainstream media from all aspects of the energy industry.

At this launch event, Dyness unveiled six new products: DL5.0C, PowerBrick, Powerbox G2, Tower Series, STACK100, and BF100. These newly tailored and specially updated products in the Pakistani market not only showcase Dyness' strong technical expertise and precise understanding of market demands but also demonstrate its firm commitment to Pakistan's energy transition by combining globally problem-solved experiences with the specific target to Pakistan.

Among the six products, the DL5.0C, as one of the core offerings, garnered significant attention from attendees. The DL5.0C supports 1C discharge, allowing it to release more power within the same time frame to meet higher energy demands while reducing user costs. Its installation flexibility is reflected in its versatile options, including wall-mounted, floor-standing, and rack-mounted setups. The compact size, integrated design, and simplified wiring make it adaptable to various indoor installation scenarios. Additionally, its excellent compatibility ensures that the DL5.0C can pair seamlessly with various inverters available on the market.

The launch event was a resounding success, with a vibrant atmosphere and over 200 professionals from the renewable energy sector in attendance. The agenda

included speeches by Dyness and Innovo executives, product demonstrations, technical exhibitions, and presentations by industry experts.

During the keynote speech, Viki Yang, Dyness' Asia-Pacific General Manager said: "We are committed to advancing global energy storage technology. The six products launched today represent not only the culmination of Dyness' technological innovation but also our dedication to supporting Pakistan's energy transition. Dyness aims to contribute to a clean, efficient, and sustainable energy future for the local community by delivering high-quality energy storage solutions."

Dyness local partner Innovo expressed strong confidence in and appreciation for Dyness' technological capabilities and innovative solutions. Mr. Muhammad Mujahid, the Director of Innovo Cooperation said: "We are proud to collaborate with Dyness, a global leader in lithium battery manufacturing. Their exceptional products, backed by cutting-edge research and development, align perfectly with our goal of delivering premium energy storage solutions to our customers".

Dyness has been dedicated to global energy storage product solutions with successful installation projects spanning Germany, the United Kingdom, Spain, the US, Australia, and more. Its official entry into the Pakistani market marks a significant milestone in Dyness' global strategy.

Pakistan is at a pivotal stage in its energy transition. The integration of clean energy generation and energy storage technologies presents a critical opportunity to modernize the nation's energy infrastructure. Dyness aims to establish a strong presence in the Pakistani market through the following initiatives: Dyness will continue investing in R&D, sharpening us at the cutting edge of the battery system, and providing paralleling value to all our customers and partners. Dyness will also continue to uphold its commitment to the Pakistani market: " Your Ultimate Choice for Safety, Quality and Efficiency!" ■

About DYNESS

Dyness, founded in 2017, is a global pioneering energy storage solutions innovator. Relying on advantageous technology and robust product R&D capabilities, Dyness has established a comprehensive product portfolio for full scenarios, including C&I and residential energy storage throughout the entire lifecycle. With its global headquarters in Suzhou, China, Dyness has provided safe, reliable, and high-quality products and services to over 500,000+ users in 100+ countries and regions.

At Dyness, customer satisfaction is always Dyness' top priority. Aligned with its mission to reduce the Earth's temperature, Dyness is collaborating with 90+ global brand partners to reduce the cost of renewable energy usage for users. As the pace of global energy transition accelerates, Dyness is committed to promoting sustainable development on a global scale through commercial deepening. It strives to work alongside the industry, market and society to build a low-carbon future worldwide.

Grid-Based Energy Storage Solutions for Pakistan

Farrukh Mahmood Mian

This article discusses the recent trends in energy storage battery systems, what is driving these trends, the new developments that are taking place and how they are going to shape the energy storage technology in the coming years. These have important implications for Pakistan which has seen one of the highest rates of increase in the world of distributed solar power generation, which is reaching 15 GWs. This is in addition to the grid-based generation capacity of 45 GWs and the combined peak capacity of 60 GWs is at least twice the peak annual demand. Unless storage solutions are deployed, the lopsided increase in solar capacity may turn out to be counter-productive.

The decades of the 1980s and 1990s saw rapid improvements in wind turbine technology while solar was still not cost-competitive. Every few months, larger turbine blades were developed and installed, while the levelized cost of energy (LCOE) from wind continued to fall until it became the cheapest form of renewable energy. Starting at the beginning of the 21st century, the world saw a massive surge in solar photovoltaic (PV) technology as the prices of solar panels underwent sharp decreases. Initially, PV technology competed with thermal solar technology (Concentrating Solar Power) - i.e., heating a medium (usually a liquid) with the sun's rays and using the heat to produce steam that would rotate a turbine. However, solar PV, due to its simple technology, ease of installation and continued efficiency improvements, has now become the industry standard, offering the lowest LCOE worldwide of any available power generation technology, renewable or otherwise.

From the very start of the renewable energy revolution, questions were raised about how wind and solar power, due to their intermittent nature, could reliably meet energy demand on a continuous basis. As the reliability problem was still in its infancy due to a relatively small quantity of installed gigawatts (GWs) in the system, not much thought was given to devising backup energy storage systems. However, sometime after 2015, as the increase in installed GWs started making wind and solar contribute an increasingly larger percentage of output to the grid, not just the intermittency problem but the supply-demand mismatch started to come to full light.

The famous Duck Curve (see chart) in the California grid (CAISO) amply demonstrates that the oversupply of solar output during the day is increasingly replacing other forms of generation. The incidence of Solar PV has reached a point whereby at midday it makes the output from conventional generation sources completely redundant. Going even beyond it, utilities are forced to curtail the output from solar farms, resulting in negative pricing of solar output in the market – meaning that producers have to be paid to hold-off their energy output.

To overcome the mismatch of supply and demand during daylight hours, it has become necessary to add "front-of-the-meter" - or grid-based - energy storage facilities. With the availability of energy storage systems, the excess output of solar plants can be stored and used during other times. Most electric utilities, especially in Australia, Germany, and California, are rapidly integrating BESS as part of the auctions for new VRE-based energy generation facilities. The rapid rise in the demand of electric vehicles (EVs) is both the result and the cause for the vast technological improvements in the electrical chemistry of storage batteries. Battery-based energy storage systems (BESS) - both at the utility scale and behind-the-meter - are also gaining more and more acceptance due to the urgent need to overcome intermittent characteristics of the variable renewable energy (VRE) solutions.

At about the same time as the grid systems were facing the dilemma of excess renewable energy, EVs were starting to gain more acceptance among the public, especially due to very attractive price rebates given by Western governments to curb carbon emissions. Due to

their nature, the storage batteries used in EVs require that their design meet at least three criteria: 1) High energy density, i.e., low weight per kWh output; 2) Use up minimal space in the vehicle body; and 3) Ability to achieve a high number of recharge cycles before depleting completely.

The business of storage batteries is presently undergoing a consolidation across three lines, at least. Firstly, the sharp fall in international prices (see chart) has forced small manufacturers to basically exit the business and just a few market leaders, mainly from China, are left standing in the business of producing and marketing storage batteries. Secondly, whereas Nickel Manganese Cadmium (NMC) batteries dominated the scene at the start of this century, Lithium Iron Phosphate (LFP) has gained a greater acceptance by the market as it now commands nearly half of the market share.

The battery requirements for grid-based systems are different from EV application, mainly due to being stationary and of much larger sizes. The grid-based energy storage solutions have benefited from the massive research in the battery chemistry that the private sector was doing in the realm of the EV industry. Furthermore, the extraction of minerals from mines located in some of the remotest parts of the world was entering the supply chain of raw material that was mainly for use in EV batteries but was equally suitable to be used in grid-scale battery modules.

A major factor for the increase in projected demand is the Inflation Reduction Act passed by the U.S. which incentivizes investments in clean energy solutions. Battery energy storage systems are not in themselves a source of clean energy but they enhance the operational efficiency of the national power systems, through optimally utilizing the outputs from solar and wind generation.

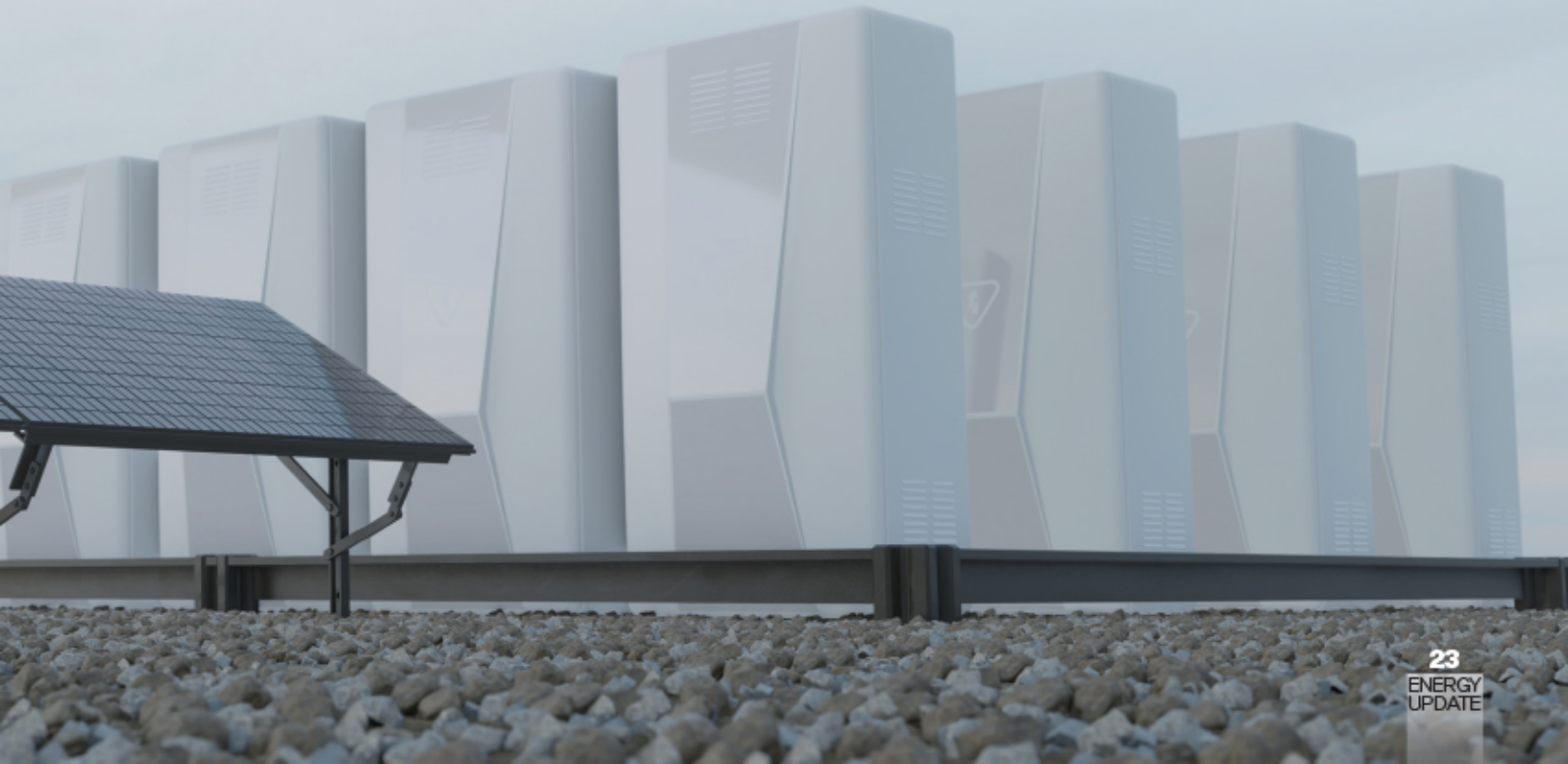
As mentioned above, the EV battery cells must meet the criteria of high energy density, lightweight, and fast charging capabilities. On the other hand, the grid storage battery cells require scalability, long cycle life, and cost effectiveness. Due to these differences, Lithium-ion batteries are becoming the standard for EVs due to their balance of performance and cost. On the other hand, Vanadium Redox flow and sodium-sulfur batteries seem to be more appropriate for BESS applications due to their ability to handle large energy capacities and long-term storage needs.

The grid-based storage systems face a challenge due to their sheer size. While a typical EV requires battery capacity of 50 Kwh to 100 Kwh, the grid storage systems could range from tens of Mwh to hundreds of Mwh. When you consider that a 1 GW output BESS can have up to 1.5 million parts, it poses a great challenge when it comes to its operability, maintenance and continuous operation. Many critical BESS components (ranging from battery cells to semiconductors in inverters and control systems) rely on complex supply chains, which are susceptible to supply shocks from a multitude of sources, including raw material shortages and regulation changes.

What are the storage choices for electric utility companies that are facing the Duck-Curve type situation (mentioned above), and which is afflicting Pakistan's electricity sector too. Worldwide, over 40 gigawatt (GW) of grid-based storage capacity was added in 2023, double the previous year's increase, split between utility-scale projects (65%) and behind-the-meter systems (35%).

Renewable resources that are located far from load centers may require transmission investments to deliver power to where it is needed. Given the intermittent nature of VRE resources, the transmission capacity used to deliver the power may be underutilized for large portions of the year and, therefore, it is not advisable to co-locate BESS systems near the VRE facilities.

In Pakistan, there is a strong case for installing the BESS systems on the sites of the Gencos' thermal generation plants that are being retired. They are close to the load-centers and have the available physical space as well as already existing power interconnection arrangements to be brought in service relatively quickly. The integration of grid storage systems offers technical challenges which NTDC will have to be mindful of. Installing BESS modules without fully understanding its complexities, can lead to system reliability problems as well as result in a less than optimized combination of VRE projects and energy storage solutions. It is proposed that efforts be intensified so that power entities remain abreast of the latest research and developments taking place in the grid-based energy-storage systems and adopt those solutions that are most appropriate for the country. ■



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GROWATT Organize Pakistan's biggest Solar Event

Mustafa Tahir

GROWATT, the globally renowned solar inverter brand, celebrated its extraordinary success in Pakistan, further solidifying its position as the market leader in the solar energy sector. The celebratory event, held in the heart of Islamabad, brought together distinguished dignitaries from government, commerce, and the renewable energy industry, marking a significant milestone for GROWATT in the region.

The event highlighted GROWATT's unparalleled achievements, including its dominance in residential, commercial, and industrial markets. With cutting-edge technology and innovative energy solutions, GROWATT has emerged as the top choice for solar energy solutions in South Asia, particularly in Pakistan.

Mr. Mian Fahad, Country Director, GROWATT Pakistan, lauded the company's rapid growth and shared his vision for the future. 'GROWATT's success in Pakistan is a testament to our commitment to providing reliable and innovative solar energy solutions. We are proud to lead the charge in driving Pakistan towards a sustainable, and clean energy future. This achievement wouldn't have been possible without the trust and support of our valued partners and customers."

The event was a grand affair, drawing an unprecedented number of attendees from various sectors. It underscored GROWATT's immense popularity and the critical role it plays in shaping the solar energy landscape in Pakistan.

The celebration not only highlighted the company's market leadership but also its dedication to sustainability and innovation. With its advanced products and robust infrastructure, GROWATT continues to pave the way for a brighter and greener future.

Climate report card 2024

Global temperatures were above average, making this hottest year to date on record; Sea level rise has more than doubled since 1993, from 0.20 centimetres per year to 0.44cm per year; climate finance may remain grossly inadequate

Alsha Khan

The writer is chief executive of the Civil Society Coalition for Climate Change

In a world shaped by accelerating climate change, disruptive technologies, geopolitical conflicts and massive human displacements, the need for bold action and value-driven leadership is critical to bend the arc of history towards justice.

As we close the calendar on 2024 and embark on 2025, data tells us an alarming story. A diagnostic analysis of past trends projects a future that looks both grim and chaotic. The two factors (climate change and negotiations) necessary for stabilising the planetary regime are misaligned. Climate change is rapidly outpacing negotiations, threatening the world with the breach of the seventh planetary boundary.

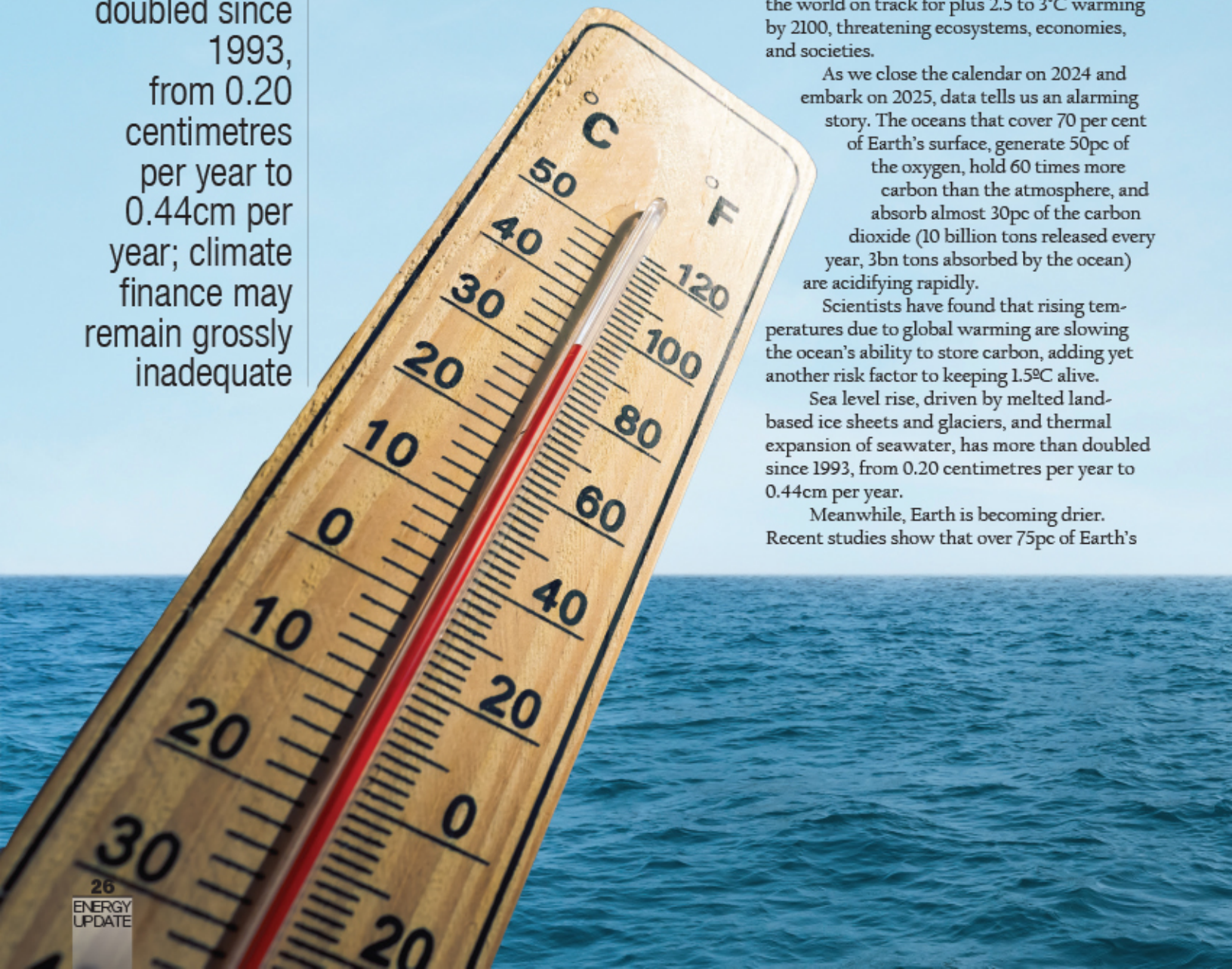
According to Nasa, global temperatures have risen by 1.1 degrees Celsius since the late 1800s. From January to November 2024, global temperatures were above average, making this the hottest year to date on record. Sea surface temperatures in November 2024 were the second highest on record, with many regions experiencing unusually warm ocean temperatures. Antarctic sea ice extent hit its lowest November value on record, at 10pc below average. The last nine years (2015-2024) have been the hottest on record, with current trends setting the world on track for plus 2.5 to 3°C warming by 2100, threatening ecosystems, economies, and societies.

As we close the calendar on 2024 and embark on 2025, data tells us an alarming story. The oceans that cover 70 per cent of Earth's surface, generate 50pc of the oxygen, hold 60 times more carbon than the atmosphere, and absorb almost 30pc of the carbon dioxide (10 billion tons released every year, 3bn tons absorbed by the ocean) are acidifying rapidly.

Scientists have found that rising temperatures due to global warming are slowing the ocean's ability to store carbon, adding yet another risk factor to keeping 1.5ºC alive.

Sea level rise, driven by melted land-based ice sheets and glaciers, and thermal expansion of seawater, has more than doubled since 1993, from 0.20 centimetres per year to 0.44cm per year.

Meanwhile, Earth is becoming drier. Recent studies show that over 75pc of Earth's



land is experiencing increasing dryness, with severe drought becoming more frequent. This trend is reshaping landscapes, stressing water resources, and intensifying wildfires and land degradation.

The northern and southern hemispheres, along with West Asia and Europe, saw large areas consumed by flames. The year 2024 also marked the worst fire since 2005, destroying 37.2 million acres of the Amazon, with 100 holdover fires from 2022 and 2023 still smouldering underground in Canada.

Global biodiversity has declined alarmingly in half a century, with nearly 1m out of 8m species at risk due to climate change. The depletion of biodiversity will have a direct impact on ecosystem services vital for life.

Large-scale migrations triggered by climate change are likely to result in the movement of a billion people by 2050 if the temperature increase hits 2ºC. By 2070, almost 20pc of Earth's land area could fall outside the temperature limits necessary for sustaining life. The political reality of the crisis may impede eco-migrants from settling in the world's rich countries, adding to the tragedy of the humanitarian crisis.

The current policies and pace of negotiations fall short of the Paris Agreement goals. The climate investment gap of $6.1 trillion per year by 2030 is too large and requires a fivefold increase to keep pace with the escalating financial climate risks.

The outcome of the COP29 negotiations is a clear indication that emissions reduction targets will not meet the 2030 timeline, and climate finance will remain grossly inadequate. The end result is most likely going to be a classic case of "too little, too late".

The unprecedented rate of glacier melting, threatening the planet's freshwater reserves, is putting human survival at risk.

In South Asia, the Third Pole holds the key to the region's ecological balance. With 100,000 square kilometres containing 3,000 to 4,700 cubic kilometres of ice, warming at 1.5°C will result in the loss of one-third of their volume by 2100, and under current warming trends, the loss could reach two-thirds. With no sign of political flexibility to change the stance on the status quo, the collapse of the cryosphere could destroy and disrupt the lives and livelihoods of over 2bn people in the region.

However, while acknowledging carbon emissions as the core problem, it is important to recognise that exclusive focus on tech solutions and market-driven strategies will not address the climate crisis. The fight against climate change needs a systemic transformation that prioritises justice, equity, and the elimination of the causes of environmental destruction to address the broader ecological crises including land degradation and resource depletion through community-driven initiatives.

A fragile beginning to 2025 offers the world a last chance to course correct and realign growth with sustainability. At the end of the day, we cannot eat cryptocurrency, drink fossil fuels, breathe carbon dioxide, and expect to survive. ■

HOT SUMMERS

Role of IFC Edge Certification in Mitigating Summer Peak Loads

Engr Asad Mahmood

Pakistan experiences extremely high summer temperatures, which cause a sharp increase in the country's electricity consumption and peak loads that put pressure on the national grid. Inefficient building structures that are not made to withstand intense heat make this scenario worse. But an increasingly important instrument for tackling this issue is the International Finance Corporation's (IFC) EDGE (Excellence in Design for Greater Efficiencies) which is a green building standard, a software application and a certification program as well.

An internationally accepted benchmark for resource-efficient building design is the IFC EDGE accreditation. It encourages the application of cutting-edge design and construction methods that reduce water usage, energy consumption, and material embodied energy. Compared to traditional structures, buildings that receive this certification usually have 20% lower energy and water consumption.

The main cause of Pakistan's summer peak load problem is the country's inadequately insulated buildings' rising use of air conditioning. These buildings frequently lack energy-saving architectural elements, which increases the amount of electricity used. Buildings can drastically lower their energy needs by implementing the IFC EDGE guidelines.

Pakistan's energy infrastructure is constantly under pressure due to the country's rapidly increasing population and rate of urbanisation.

Adopting the IFC EDGE certification can be crucial for:

Reducing Peak Load Stress: Energy-efficient construction reduces the need for costly power imports and prevents blackouts by lowering the demand for electricity at crucial times.

Economic Benefits: Saving money on energy means lower expenses for homes and businesses, which promotes economic stability.

Environmental Impact: Pakistan's environmental sustainability goals are aided by reduced greenhouse gas emissions from reduced energy demand.

The IFC EDGE certification provides Pakistan with a useful and effective way to address its summer peak load issues. Pakistan can take a step towards a more sustainable, financially feasible, and energy-secure future by promoting the construction of resource-efficient buildings. ■

Efforts to build green economy gain momentum

A green economy prioritises sustainable development by integrating environmental, social, and economic goals

Mansoor Ahmad

Global efforts to bolster the green economy are gaining momentum to counter the adverse impacts of unsustainable practices that increase environmental risks and ecological scarcities. Pakistan has recently recognised the importance of transitioning towards a green economy but lags significantly behind regional economies.

A green economy prioritises sustainable development by integrating environmental, social, and economic goals. Pakistan has taken initial steps towards adopting this model, though progress remains at a nascent stage. The Alternative and Renewable Energy Policy (AREP) 2019 aims to generate 30 per cent of the country's electricity from renewable sources by 2030. Large-scale reforestation efforts, such as the Billion Tree Tsunami, and attempts to secure international funds like the Green Climate Fund are notable initiatives.

However, the countrys faces significant challenges in this transition. The country relies heavily on fossil fuels, which account for 62 per cent of its electricity generation. Weak enforcement of environmental regulations, limited investments in green technologies and insufficient prioritisation of sustainability further hinder progress. Governance issues and financial constraints exacerbate the situation.

One critical aspect of a green economy is attaining resource efficiency, which Pakistan struggles to achieve. For instance, sustainable seafood exploitation could contribute significantly to the green economy if managed effectively. Sustainable fishing practices ensure fish stocks are preserved, biodiversity is maintained and marine habitats such as coral reefs and mangroves are protected. In contrast, unsustainable practices lead to overfishing, habitat destruction and biodiversity loss, undermining the principles of sustainability.

Despite possessing a significant coastline of approximately 1,050 kilometres and an exclusive economic zone (EEZ) covering 290,000 square kilometres, Pakistan has not fully capitalised on its seafood potential. The country's marine fish production ranges between 400,000-500,000 metric tonnes annually -- well below its potential. Seafood exports, valued at $350-450 million annually, pale compared to regional competitors like India and Vietnam. Alarmingly, an estimated 30-40 per cent of the catch is wasted due to inadequate storage, transportation and processing infrastructure.

Overfishing has depleted key fish stocks, while outdated fishing techniques and vessels reduce efficiency and sustainability. Pollution in coastal areas further diminishes marine biodiversity and fish quality. Poor regulation and enforcement in fisheries management and limited value addition also negatively impact exports.

To address these issues, the country must implement quotas, regulate fishing seasons and protect breeding grounds. Encouraging fish and shrimp farming with eco-friendly techniques is essential. Modernising fishing fleets, cold storage facilities and processing units can significantly enhance efficiency. Establishing marine protected areas (MPAs) and reducing coastal pollution are also critical measures. Globally, several nations have made substantial progress in the green economy. Denmark leads in renewable energy, with over 50 per cent of its electricity needs met through wind energy. Germany's Energiewende policy and New Zealand's focus on sustainable agriculture and renewable energy are noteworthy examples.

In South Asia, India has achieved remarkable advancements in renewable energy, particularly solar power, under the International Solar Alliance, aiming for 500GW of non-fossil fuel capacity by 2030. Sri Lanka has set ambitious renewable energy targets, with a goal of 70 per cent by 2030. Vietnam has heavily invested in solar and wind energy, while Indonesia capitalizes on its geothermal potential as the world's second-largest producer.

According to Iftikhar Ali Malik, former president of the SAARC Chamber of Commerce and Industry, the development of the Gwadar Port and the China-Pakistan Economic Corridor (CPEC) presents unparalleled opportunities for Pakistan to boost its green economy alongside maritime trade and logistics. ■

Courtesy: The News

Inaugurates Summit to Foster Industry Collaboration

Khalid Iqbal

Suzhou, China: GoodWe, a global leader in solar inverters and energy solutions, inaugurated its first Global Partner Summit at its new global headquarters in Suzhou, China. Themed Empowering Future of Energy Together: Opportunities, Challenges, and Collaborations, the event gathered 500 industry players worldwide to foster collaboration, exchange insights on industry dynamics, and showcase GoodWe's latest innovations accelerating the renewable energy sector forward.

In his keynote address, Daniel Huang, Founder and CEO of GoodWe, emphasized the company's win-win growth model: "Our partners have been instrumental in GoodWe's journey, enabling us to meet the rising global demand for innovative renewable energy solutions. As the world transitions to a clean energy future, this collaboration becomes more essential than ever."

A highlight of the summit was the opening ceremony for GoodWe's new global headquarters, a green-building that designed to meet sustainability standards. The building achieves a comprehensive energy saving ratio over 50% and a renewable energy utilization ratio of nearly 35%. Incorporating GoodWe's self-developed solar products and technologies, the building demonstrates the company's efforts towards sustainable development.

In response to this shift, GoodWe has been actively expanding its product portfolio to offer comprehensive, end-to-end solutions tailored to diverse energy needs. Huang explained, "This comprehensive capability is made possible by our photovoltaic inverter expertise, rooted in advanced power electronics."

During the summit, GoodWe showcased its range of solutions across residential, commercial and industrial (C&I), and utility-scale sectors, along with innovations in BIPV and heat pump technologies. In-depth discussions also took place on key industry challenges and opportunities, including the evolution of distribution, supply chain localization, and advancements in smart energy management.

14th ANNUAL
FIRE SAFETY
AWARDS & CONVENTION 2024

Modernization of Karachi's fire brigade services urged

Regulations mandatory to stop misuse of basement parking spaces in multi-storey buildings for warehousing purposes: Ruqiya Naeem

Group Photo of Award Winners with Chief Guest Syed Nasir Hussain Shah Minister Planning and Development, Sindh and Team NFEH.

Engr. Nadeem Ashraf

On December 12, 2024, the National Forum for Environment and Health (NFEH) hosted the 14th Fire Safety & Security Convention at a local hotel in Karachi, bringing together industry leaders, government officials, and safety advocates to discuss vital fire safety measures for urban environments. This annual convention has become a cornerstone event aimed at ensuring that cities like Karachi implement the best fire safety arrangements, particularly in high-rise residential and commercial buildings, as well as in various industrial sectors.

The event featured Sindh Minister for Planning & Development and Energy, Syed Nasir Hussain Shah, as the chief guest. In his address, Shah emphasized the provincial government's ongoing commitment to supporting the Karachi Metropolitan Corporation and the Rescue 1122 service in their firefighting efforts. He highlighted the importance of equipping these agencies with modern firefighting tools and machinery to minimize the impact of fire emergencies on lives and properties.

Group Photo of Panelist with Chief Guest Syed Nasir Hussain Shah. Also seen in the picture are President KATI and SITE and others

From L to R Syed Nasir Hussain Shah Minister Planning and Development Sindh, M. Naeem Qureshi President NFEH, Imran Taj President FPIP, Mr. Shahid Masroor Former Addl. Controller of Civil Defence Karachi, M. Ahmed Noorani GM HSE-Fire Safety at Gul Ahmed, Ruqiya Naeem, Secretary General NFEH, Dr. Asad Ullah Amin Shah, Advocate Nadeem Shaikh, Engr. Nadeem Ashraf VP NFEH and Rehana Yasmeen RESCUE 1122 are addressing on the occasion.

Shah pointed out the critical need for businesses and industries to take proactive measures against fire risks, especially given Karachi's history of devastating fire incidents. He proposed the establishment of a task force comprising government representatives, civic agencies, and industry stakeholders to ensure compliance with fire safety laws. This collaborative approach aims to foster a culture of safety within the private sector.

The convention also served as a platform to recognize excellence in fire safety practices, with NFEH presenting the 14th Fire Safety Awards to 45 companies and industries that demonstrated outstanding commitment to fire safety standards. The awards not only celebrate achievements but also encourage healthy competition among businesses to adopt robust fire safety measures for the protection of employees, visitors, and assets.

Former Additional Controller of Civil Defence Karachi, Shahid Masroor, conducted the conference with enthusiasm, engaging participants in discussions on the importance of training for emergency responders. He underscored the necessity for drivers and volunteers from major ambulance networks in Karachi, such as the Chippa Foundation and Edhi Foundation, to receive proper training in trauma and emergency management, a proposal that garnered widespread support from attendees.

Ruqiya Naeem and M. Naeem Qureshi presenting memento to Syed Nasir Hussain Shah.

Key speakers at the convention included Asadullah Amin Shah, Muhammad Ahmed Noorani, General HSE-Fire Safety at Gul Ahmed, Wahaj ur Rehman, Naeem Yousuf, ex-commandant at the National Disaster Management Authority, and Advocate Nadeem Sheikh. Each speaker addressed various aspects of fire safety, emphasizing the need for comprehensive safety protocols in urban areas, industries, and commercial establishments.

Ahmed Azeem Alvi, President of the SITE Association of Industry, advocated for integrating fire safety education into school curricula, ensuring that future generations are equipped to handle emergencies effectively. He also called for government incentives to encourage small businesses to adopt fire safety protocols.

Junaid Naqi, President of the Korangi Association of Trade & Industry, echoed this sentiment, suggesting that fire safety training should be as fundamental as earthquake preparedness in Japan. He urged industries to embrace modern safety technologies to safeguard workers' lives.

Rehana Yasmeen, Rescue Commander at the Sindh Emergency Rescue Service,

Glimpse of Stall

Glimpse of Panel discussion President SITE Ahmed Azeem Alvi, President KATI Junaid Naqi, President FPIP Imran Taj and Naeem Yousf, Ex Commendent, NDMA seen in the pic.

provided insights into the service's extensive operations, having responded to over 700,000 medical emergencies and 22,000 road traffic accidents. She announced plans for a motorcycle-based rescue service to improve response times in densely populated areas.

Mahboob Ali Shaikh, Commandant of the Federal Civil Defence Training School in Karachi, highlighted the importance of first-aid preparedness, advocating for the presence of medical kits in homes and vehicles.

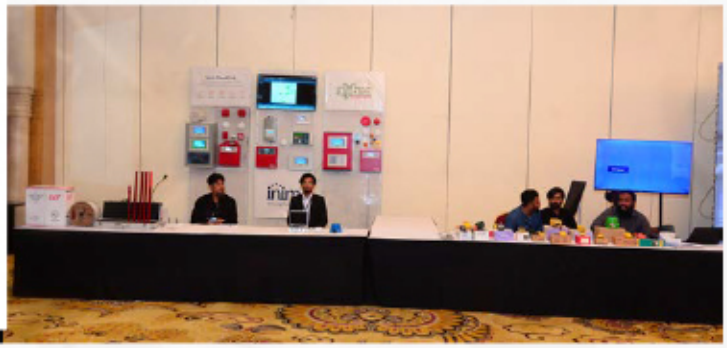
At the convention, he informed the audience that the Civil Defence Training School in Karachi has been consistently offering training courses in emergency response and fire prevention for volunteers eager to join these vital services.

Imran Taj, President of the Fire Protection Industry of Pakistan, stressed the need for strict adherence to fire safety regulations within the construction sector, while NFEH President Naeem Qureshi called for collaborative efforts between the private sector, NGOs, and government agencies to prevent fire disasters.

Ruqiya Naeem, NFEH General Secretary, emphasized the modernization of Karachi's fire brigade services, advocating for regulations that prevent the misuse of basement parking spaces in multi-storey buildings for warehousing purposes. She insisted on the necessity of proper fire safety systems in shopping centers.

Group Photo of Speakers with Team NFEH.

Glimpse of Audience



Glimpse of Stalls

14th ANNUAL

FIRE SAFETY AWARDS & CONVENTION 2024

PICTURES OF AWARD WINNERS

ABBOTT LABORATORIES PAKISTAN LIMITED

ACM HI-TECH ENGINEERING PVT LIMITED

AGP LIMITED

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ARTISTIC MILLINERS PRIVATE LIMITED

BANK ALFALAHALFALAH

BELTEXCO LIMITED

CENTURY PAPER & BOARD MILLS LIMITED

DAWLANCE GROUP OF COMPANIES

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EFU GENERAL INSURANCE COMPANY LIMITED

FAUJI FERTILIZER BIN QASIM LIMITED

14th ANNUAL
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AWARDS & CONVENTION 2024

PICTURES OF AWARD WINNERS

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GOTH MACHHI

HUANENG SHANDONG RUYI (PAKISTAN)
ENERGY (PRIVATE) LIMITED

KOHINOOR TEXTILE MILLS LIMITED

LIBERTY MILLS LIMITED

LUCKY CEMENT LIMITED

LUCKY CORE INDUSTRIES LIMITED
(ANIMAL HEALTH BUSINESS)

LUCKY CORE INDUSTRIES LIMITED
(SODA ASH BUSINESS)

LUCKY TEXTILE MILLS LIMITED

MEEZAN BANK LIMITED

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PAK MATARI

PAKARAB FERTILIZERS LIMITED

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PHARMEVO PVT LIMITED

PREMIER PIPE INDUSTRIES (PVT) LIMITED

SAPPHIRE FINISHING MILLS LIMITED

PAKISTAN SECURITY PRINTING CORPORATION

SIEMENS GAMESA RENEWABLE ENERGY

SINO SINDH RESOURCES LIMITED

SUI NORTHERN GAS PIPELINES LIMITED (SNGPL)

SUI SOUTHERN GAS COMPANY

SYNGENTA PAKISTAN

14th ANNUAL

FIRE SAFETY AWARDS & CONVENTION 2024

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Pursuit of climate prosperity

Commitments for a sustainable future

Dr. Khalid Waleed

The writer has a doctorate in energy economics and serves as a research fellow in the Sustainable Development Policy Institute (SDPI)

Public institutions in Pakistan should enact legislative frameworks that institutionalise climate commitments

The pursuit of climate prosperity has become a defining theme of international cooperation, signalling the end of an era when climate commitments were viewed in isolation from socio-economic development with the operationalisation of the Climate Vulnerable Forum (CVF) and their climate prosperity plans (CPPs).

The latest cycle of Nationally Determined Contributions (NDCs), referred to as NDCs 3.0, reflects a more cohesive approach: countries are updating their pledges under the Paris Agreement by mapping out concrete sectoral and cross-sectoral strategies that unite economic growth, social equity, and environmentally sustainable economic priorities. Recent examples from the UAE, the UK, and Brazil, presented at COP29, underscore the importance of operationalising Article 4.1's temperature targets in a manner that respects national circumstances yet pushes global ambition toward limiting temperature increases to well below 2 C and, ideally, toward 1.5 C.

This new wave of climate commitments extends beyond symbolic statements. Sector-focused policies for renewable energy, decarbonised transport, and industrial transformation exemplify the progression principle enshrined in Article 4.2, which requires each successive NDC to demonstrate incremental ambition. Yet the tension between economic prerogatives and climate action remains palpable, most visibly in nations reliant on fossil fuel revenues.

Even when updated NDCs articulate bold objectives, inconsistencies in implementation can dilute progress, as evidenced by the underutilisation of Decision 4/CMA.1 on clarity in accounting methodologies. Without robust and transparent accounting, global stocktaking under Article 14 risks being muddied by inconsistent data, eroding trust and hindering coordinated action.

Climate prosperity, as illustrated by Brazil's CHAMP initiative 'Coalition of High Ambition Multilevel Partnerships', elevates climate policy from a narrow focus on emissions reductions to a broader transformative agenda. By incorporating subnational authorities, local governments, and civil society, these frameworks can generate synergy between climate resilience and socio-economic benefits.

Decision 4/CMA.1 emphasises the necessity for clarity in NDC design, ensuring that ambitious goals translate into measurable and verifiable outcomes. The draft decision -/CMA.6 advances this discourse by mandating an annual synthesis report on NDCs – a critical instrument to aggregate best practices, identify bottlenecks, and pinpoint areas of overlap or duplication that could benefit from collective interventions.

Although ambitious commitments are increasingly common, disparities remain. Major

emitters sometimes present laudable targets but lack the policy muscle or enforceable frameworks to put them into effect. Article 4.3's call for the highest possible ambition continues to clash with entrenched economic dependencies, particularly when fossil fuels still underpin large segments of national revenue.

More acutely, adaptation measures remain underprioritised, despite Article 7.9 stipulating their integration into NDCs, leaving frontline communities vulnerable and undermining the comprehensiveness of climate strategies. Similarly, loss and damage considerations often lack detailed guidance in national pledges, weakening the potential for a truly inclusive approach that safeguards those most at risk.

For Pakistan, whose vulnerability to climate shocks is well documented, the trajectory toward climate prosperity demands targeted policy choices. In a context where development deficits converge with intensifying climate threats, updated NDCs must serve not just as compliance documents but as cornerstones of socio-economic transformation.

A National Climate Action Transparency Portal could complement the Article 13 requirements by systematically tracking progress on emissions reduction, adaptation initiatives, and loss and damage assessments, feeding the information for Biennial Transparency Reports (BTRs). Coupled with annual synthesis reports as outlined in Decision 1/CMA.3, paragraph 30, this platform would allow policymakers to detect gaps in near real-time, refining strategies that unite mitigation with resilience-building.

Public institutions in Pakistan should enact legislative frameworks that institutionalise climate commitments, mandating that federal and provincial budgets allocate resources for renewable energy expansion, resilient infrastructure, and climate-smart agriculture. Incentives can encourage research and development in low-carbon technologies, creating local supply chains that support green jobs and economic growth.

Complementing these measures, the private sector must align corporate strategies with net-zero aspirations, invest in decarbonising operations, and adopt transparent accounting methodologies to bolster the credibility of emissions reporting. Greater financial innovation, including green bonds and blended financing models, could channel private capital toward clean energy, sustainable transport, and climate-resilient urban development, amplifying the momentum generated by public investments.

By institutionalising provincial-level trading systems, Pakistan can reap the dual benefit of spurring localised investment in low-carbon projects and aligning overall NDC targets with equitable development, thus demonstrating a model for subnational integration that resonates with both national development priorities and global climate objectives.

Pakistan's integration of loss and damage considerations into its NDC can fortify the country's standing in international forums, including the Warsaw International Mechanism and the Global Stocktake under Article 14.

Climate prosperity envisions a future in which decarbonisation and socio-economic progress reinforce each other. Pakistan can fast-track this vision by establishing a Climate Prosperity Fund to underwrite integrated projects that combine emissions reductions, adaptation measures, and the generation of green jobs. These investments can also nurture a culture of innovation, encouraging homegrown enterprises to develop climate-compatible products and services. By proactively participating in global coalitions like the G20's net-zero initiative and regional climate dialogues, Pakistan can access technical support, secure climate finance at competitive rates, and broaden the impact of domestic climate actions.

In the age of NDCs 3.0, ambition without accountability is futile; every pledge must be backed by transparent implementation, reliable metrics, and clear legal scaffolding. From legislative mandates to corporate practices and grassroots engagement, a cohesive strategy hinges on synchronising public, private, and people-led efforts. Failure to seize the opportunities for climate prosperity could lock nations into unsustainable development paths, jeopardising global temperature goals and undermining collective resilience. But by aligning policy reforms with transparent governance, inclusive participation, and innovative financing, countries like Pakistan can carve out a resilient, low-carbon future.

The evolution of NDCs, in essence, is a clarion call for nations to move from pledges to practice, ensuring that climate commitments spur an era of equitable growth that endures for generations to come. ■

PAEC gets licence to build Chashma-5 nuclear plant

EU Report

The Pakistan Atomic Energy Commission (PAEC) has been issued the licence to construct the Chashma Nuclear Power Plant Unit 5 (C-5). The Pakistan Nuclear Regulatory Authority (PNRA) issued the licence to build C-5, the largest plant producing electricity through nuclear power with a capacity of 1200 MWe, according to a PNRA press release issued on Thursday.

The PAEC applied for the licence in April of this year, along with the Preliminary Safety Assessment Report and other documents about the design and operational aspects of nuclear safety, radiation protection, emergency preparedness, waste management, and nuclear security. After a thorough review and assessment of and fulfilment of regulatory requirements in compliance with the relevant national and international standards, the licence was issued, the PNRA press release stated.

C-5 is an advanced third-generation Pressurised Water Reactor of Chinese Hualong design, having active and passive safety features, including a double-shell containment and reactor-filtered venting system. It has a lifespan of 60 years. This is the third nuclear power plant in Pakistan with this design. Two other plants, Karachi Nuclear Power Plants units 2 and 3, are already operating successfully and adding electricity to the national grid.

The C-5 has already been approved by the executive committee of the National Economic Council. The plant will be built at a cost of $3.7 billion. ■

Making 2024 count economically

Pakistan's stabilisation efforts began yielding tangible results

Syed Asad Ali Shah

These achievements were bolstered by a $7 billion International Monetary Fund (IMF) arrangement that averted a financial crisis and stabilised the balance of payments. However, systemic and structural flaws – excessive taxation, high energy costs, mismanagement in key sectors like agriculture, poor governance of social services, and government-imposed restrictions on the digital economy – continued to undermine sustainable growth and investment.

After years of economic turmoil, Pakistan's stabilization efforts began yielding tangible results. Inflation, which had peaked at 29 per cent in FY 22-23 and 20 per cent in FY 23-24, dropped below 5.0 per cent by November 2024, surpassing the government's target of 12 per cent. This decline provided significant relief for businesses and consumers. Complementing these improvements, the State Bank of Pakistan (SBP) implemented aggressive monetary easing, reducing the policy rate from 22 per cent to 13 per cent and lowering interest rates to 12 per cent. These measures are expected to save the government over Rs1.2 trillion in interest costs, easing fiscal pressures and creating space for development initiatives.

A noteworthy achievement in 2024 was the government's decision to avoid budgetary borrowing in the first half of the fiscal year, instead retiring Rs2.03 trillion in debt. This unprecedented step, supported by the SBP's record profit of Rs3.42 trillion, eased fiscal pressures and unleashed excess liquidity into the banking system. This liquidity, combined with lower interest rates, has created an opportunity to channel funds into productive sectors such as industry, agriculture, and infrastructure. However, realising the potential of this progress depends on decisive government policies and actions to drive job creation and sustainable economic momentum.

The current account surplus reached over $730 million in November, marking the fourth consecutive month of surpluses and the largest in nearly a decade. Projections for FY24-25 suggest the surplus could exceed $2 billion, fueled by rising remittances, improved exports, and a stable rupee. These developments spurred significant investment in the Pakistan Stock Exchange (PSX), with the KSE index surging by 80 per cent during the year and market capitalisation expanding substantially.

Similarly, Pakistan's energy costs remain among the highest globally, making the cost of doing business prohibitively expensive. This undermines the competitiveness of Pakistani goods in international markets and deters foreign and domestic investment. Repeated coercive renegotiations of power purchase agreements have further eroded investor confidence, discouraging the long-term investments needed to address circular debt and energy insecurity.

Agriculture, a cornerstone of Pakistan's economy, also faced significant challenges. Early in 2024, increased wheat production was initially a positive development. However, poor procurement policies (more specifically federal and Punjab governments reluctance to purchase at price they had guaranteed to the farmer) led to a collapse in wheat prices,

falling below Rs3000 per maund against the committed minimum price of Rs3900.

This caused substantial losses for farmers, many of whom are now expected to shift to alternative crops. Such failures highlight the urgent need for better planning, fair procurement practices, and investments in agricultural technology to ensure food security and protect the livelihoods of rural communities.

The digital economy, a vital driver of innovation and growth, was hindered by government-imposed restrictions on internet access and social media platforms. These measures disrupted entrepreneurial activity, discouraged investment, and weakened Pakistan's position in the global digital economy. In an era defined by technological transformation, such actions have significantly limited the country's potential to harness digital tools for economic resilience and innovation.

The tax system must be overhauled to broaden the base, improve compliance, and reduce reliance on high tax rates. Expanding the tax net to include under-taxed sectors and addressing exemptions for influential groups can create a fairer and more effective revenue system. The energy sector requires immediate reform, including major privatisation of generation, transmission and distribution sub-sectors to reduce the role of the public sector, and enhance efficiency and productivity through competition.

The digital economy offers immense potential for growth. Removing restrictions on internet access and social media platforms is a necessary first step. Beyond this, the government must invest in digital infrastructure and foster public-private partnerships to create a thriving ecosystem for tech-enabled entrepreneurship. Supporting startups with seed funding, incubators, and reduced regulatory hurdles will stimulate innovation and diversify the economy.

While the IMF programme has helped Pakistan in achieving much needed stabilisation, it is important to appreciate that such programmes address immediate crises but fail to tackle systemic issues in governance, taxation, energy policy, and human capital development. Without meaningful structural reforms, the progress achieved in 2024 risks being short-lived.

By fostering innovation, investing in its people, and embracing structural reforms, Pakistan can transition from stabilisation to enduring growth. The choices made today will determine whether 2024 becomes a fleeting moment of relief or a foundation for long-term resilience. The stakes have never been higher.

SOLAR PARTNERSHIP

Diwan Energy and BYD:
Forging a Path Toward a Sustainable Energy Future

A high-profile delegation from Pakistan's solar industry, led by Diwan Energy and the Chairman of the Pakistan Solar Association (PSA), visited BYD's headquarters in Shenzhen to explore cutting-edge innovations in renewable energy. The delegation included prominent figures from Pakistan's manufacturing and energy sectors.

The visit showcased BYD's state-of-the-art facilities, with a particular focus on their groundbreaking advancements in lithium battery technology and solar energy solutions. Delegates were introduced to BYD's high-capacity energy storage systems, which are critical for sustainable power solutions across residential, commercial, and industrial applications.

Diwan Energy played a pivotal role in spearheading strategic discussions on joint ventures, technology transfers, and partnerships with BYD. These initiatives aim to revolutionize Pakistan's solar market, reduce reliance on fossil fuels, and align with the nation's renewable energy goals. This collaboration marks a significant leap toward a greener, low-carbon future for Pakistan.

Domestic natural gas output declines 10% yearly

County consumes over two million tons of LPG; local production meets only 40 demand

Engineer Arshad

The Oil and Gas Regulatory Authority (Ogra) oversees Pakistan's gas sector, including Liquefied Petroleum Gas (LPG), Natural Gas, and Compressed Natural Gas (CNG). However, domestic natural gas production is declining at 8-10 percent annually. Meanwhile, LPG is growing rapidly, accounting for 1.5 percent of Pakistan's energy mix.

Pakistan consumes over two million tons of Liquefied Petroleum Gas (LPG) annually, but local production accounts for only 40% of this demand. To fill the gap, approximately 40 percent of LPG imports enter through land borders, predominantly via Taftan, Gabd, and Mand. This influx, largely unregulated, raises significant concerns about quality and safety.

The imported LPG contains hazardous impurities, due to its origin in outdated refineries across the border.

The absence of robust quality checks has allowed these low-quality products to flood the market, exacerbating Pakistan's already critical air quality issues. The unchecked adulteration of LPG not only worsens smog but also poses serious health and environmental risks.

In Sindh and Punjab, LPG adulteration with carbon dioxide (CO?) is rampant, allegedly facilitated by the collusion of the Hydrocarbon Development Institute of Pakistan (HDIP), local administrative authorities, and Ogra. CO2 is injected into tankers to artificially increase pressure for improved vaporisation, a hazardous practice that has resulted in fatal accidents too.

Research by esteemed institutions such as the Environmental Protection Agency (EPA, USA) and the International Energy Agency (IEA) (2020) underscores the dangers of such practices. Combustion of hydrocarbons like natural gas, oil, or coal typically produces carbon dioxide (CO2) as the main byproduct when oxygen combines with these fuels. However, incomplete combustion—caused by insufficient oxygen supply or low temperatures—results in the production of carbon monoxide (CO), a highly toxic and harmful byproduct.

This dual threat from CO2 adulteration and CO emissions highlights the urgent need for stringent action to check quality assurance in Pakistan's LPG sector.

NASA underscores the pivotal role of carbon monoxide (CO) in atmospheric chemistry, as it contributes to the formation of ground-level ozone and urban smog, which degrade air quality and impair the atmosphere's natural cleansing mechanisms.

Beyond CO2 adulteration, LPG coming through the border contains other impurities as well such as, ethylene, propylene, styrene, sulfur compounds, oily residues, amines, benzene, and

toluene are also prevalent, further exacerbating environmental degradation and posing serious health risks. These contaminants highlight the urgent need for stringent quality control measures and regulatory oversight to address the deteriorating air quality due to the unchecked adulteration of LPG.

Filling of LPG from Cylinder to Cylinder at the distributor premises of LPG marketing companies or at any other unauthorized place/shop normally doing illegal decanting is full of risks. This results in several LPG fire-related accidents that were reported countrywide during the last couple of years due to illegal decanting and adulteration. This is one record of Ogra that mostly filling of cylinders is not carried out at LPG Storage and Filling Plants being the licensed premises.

This is another sad story of the LPG sector that Ogra issued 315+ licences for LPG Marketing Companies and 5,800 for LPG Distributors.

In the year 2011, there were 76 marketing companies registered with Ogra. This massive growth came when the Aristotle of Pakistan LNG Limited opened doors for big companies, which is also one of the reasons behind adulteration in LPG.

When comparing Pakistan's annual LPG consumption, which exceeds two million tons, with Bharat Petroleum's robust marketing and distribution infrastructure, the disparity in operational efficiency and quality assurance becomes evident.

Bharat Petroleum boasts an extensive and integrated network. This infrastructure ensures seamless delivery of high-quality LPG and cylinders directly to customers, embodying a service model unparalleled in the region.

A cornerstone of Bharat Petroleum's "Pure for Sure" initiative is the tamper-proof seal with QR codes on LPG cylinders. This innovation guarantees cylinder integrity and quality from the production plant to the customer's doorstep. This model provides a blueprint for maintaining international quality standards and operational excellence, addressing both customer satisfaction and safety concerns.

For Pakistan, adopting a model akin to Bharat Petroleum's could revolutionize its LPG sector, ensuring the delivery of safe, high-quality, and tamper-proof products directly to end-users. This system, centered on stringent quality control, innovative mechanisms like tamper-proof seals with QR codes, and operational transparency, could significantly elevate the standards of the LPG industry. However, substantial barriers hinder such progress.

In Pakistan, LPG marketing companies wield disproportionate influence, permeating regulatory and financial systems and exerting control over the appointments of key officials in entities like OGRA, HDIP, and the Ministry of Petroleum. This entrenched influence suppresses the possibility of adopting forward-thinking models like Bharat Petroleum's.

As a result, the Ogra-compromised management is outdated, perpetuating practices that fail to address substandard product quality and rampant adulteration. These issues, left unchecked, continue to degrade Pakistan's environment and public health, tarnishing the nation referred to as the "Land of the Pure."

Implementing a model inspired by Bharat Petroleum requires an unwavering commitment to transparency and accountability. These steps are not only necessary to elevate Pakistan's LPG sector but also critical to mitigating the environmental and health risks posed by low-quality and adulterated LPG distribution.

Given the entrenched corruption and institutional stagnation within Ogra, HDIP, and the Ministry of Petroleum, meaningful reforms may only be possible through external intervention.

ENERGY NEWS

AI energy demands

Omar Ocampo And AJ Schumann

Texas' electrical grid made national headlines in the winter of 2021 when the state experienced statewide power outages. The Electric Reliability Council of Texas (ERCOT), the state's power grid operator, was caught completely off-guard when a winter storm exposed the organization's lack of severe weather preparedness. Embarrassed, ERCOT developed a roadmap to increase the reliability of its energy delivery system.

But guaranteeing a reliable flow of energy from the state's generating plants to the homes and businesses of Texan residents has proven more difficult than expected. ERCOT recently announced that if a comparable storm were to hit the Lone Star State this winter, there is an 80 percent chance that they would again experience blackouts during peak hours.

Failure to resolve Texas' power grid bottlenecks is perhaps not entirely ERCOT's fault. Demand for energy in the state has ballooned in recent years thanks, in part, to the explosion and hype around artificial intelligence.

A significant expansion in the supply of data centers is needed to meet artificial intelligence demand because the systems rely on vast computational power. AI systems are energy hungry – for example, a query using ChatGPT takes ten times the energy of a traditional Google search.

There are approximately 342 data centers currently operating in Texas. Running these systems non-stop, daily, for twenty-four hours, requires a gargantuan amount of electricity. As a result, ERCOT has identified data centers as presenting a potential energy emergency alert risk at night and during early morning hours this winter. Data centers are currently consuming close to 9 percent of the energy produced in Texas and it is putting a significant strain on its power grid. Texas is a microcosm of the threat artificial intelligence poses to the world – lack of energy security for households, an accelerating climate crisis, and the consolidation of corporate power.

It is estimated that new AI servers that will be sold in 2027 will consume between 85 and 134 terawatt-hours annually. This is comparable to the electricity consumption of 18 million people living in the Netherlands.

Data centers can be the size of multiple football fields, and they are dependent on energy-intensive cooling systems that prevent computer servers from overheating and crashing. Water is an important component for cooling towers and lots of it is needed to bring down the temperature of server equipment.

An analysis conducted by the Washington Post and the University of California, Riverside found that generating a 100-word email with ChatGPT-4 requires the use of at least one water bottle. Multiply this by millions of queries that are inputted each day, and you can get an idea of the scale of the tech sector's water consumption. In regions where water is already scarce, the unquenchable thirst of Big Tech hits especially hard. ■

Courtesy: Counterpunch.org

New Energy Vehicle Policy

Removal of decades-old polluting vehicles still a dream

Aamir Shafaat Khan

Even as the draft of the New Energy Vehicle Policy (NEVP) 2025-2030 predicts a 30 per cent share of new electric vehicles by 2030, 90pc by 2040, and 100pc by 2050, it has not seriously touched the main issue of removing decades-old vehicles responsible for polluting air quality and promoting smog.

With business as usual, the government expects to increase its fuel import bill to $64 billion by 2060. The above policy targets new sales of NEVs with an ambitious 100pc zero-emission vehicle fleet by 2060, so the fuel bill will gradually reduce and be eliminated by 2060.

The NEVP draft, while mainly focusing on 20-year-old vehicles, lacks any serious measures to remove 30- 40-year-old private transport vehicles, many of which are visible on Karachi's dilapidated roads.

The 30-page draft, however, carries a replacement scheme in which if a consumer wants to sell their old petrol/diesel vehicles to buy a NEV, the government will offer credit amounting to 20pc of the original value of the old vehicle in addition to its scrap value.

Govt outlines ambitious targets for NEV adoption yet fails to address systemic removal of decades-old polluting vehicles.

The old vehicle will then be taken into government custody for removal from the national mobility portfolio. The condition is that the consumer must use the credit amount and the scrap value exclusively to purchase the NEV.

A notable auto assembler has questioned how the government will fund this 20pc or scrap value; it will be a provincial subject, but what will happen if the provincial governments do not comply? He added that tall promises in previous auto policies have also never been fully implemented.

There is a need to immediately implement the "Old Vehicles Scrapping Policy" in collaboration with provincial governments to eliminate over 20-year-old used vehicles including cars, light commercial vehicles (LCVs), pickups and vans, contributing to carbon emissions. Similar scrapping policies exist worldwide to improve the air quality in major cities.

The federal government needs to provide a fair scrap value against scrapped vehicles funded through private steel melters, 100pc registration and road tax waiver on new vehicles by provincial governments against vehicle scrapping certificates and income tax rebates up to 50pc to the filers against their income tax liability for the year on the purchase of new hybrid, plug-in hybrid, and battery EVs against the scrapping certificate, the assembler said.

The draft NEVP policy suggests that CO2 emissions from the transport sector currently stand at nearly 90 million tonnes without mentioning the source for this critical information. In contrast, the Pakistan Energy Yearbook suggests that the energy consumed by the transport sector in 2023 is 15m tonne of oil equivalent, translating into total CO2 emissions at under 44m tonnes.

The Environmental Protection Agency (EPA) or any other government authority must ensure that the vehicular emissions must be scientifically measured and documented to allow for sound policy-making."The government should also conduct a thorough cost-benefit analysis of all policy proposals and evaluate whether the country has enough 'fiscal space' to ensure policy continuity," the assembler said.

The proposed NEVP policy roughly provides Rs4-5m worth of duty and tax subsidy per vehicle, which will cost the national exchequer approximately Rs230bn per year and cumulatively over Rs1.4 trillion over a five-year period, the assembler estimated. It will also increase our import bill by $1.3bn every year as demand will increase for NEVs given the massive concessions. The total fuel savings per year is estimated at only $100m, ignoring the cost of imported fuel used at generation plants.

The government also wants to utilise excess generation capacity. Still, experts also reveal that even if 50,000 NEVs replace fossil fuel vehicles in any given year — it will only consume 0.07pc of the 46,000MW of generation capacity — 60pc of which run on fossil fuels, coal/gas/furnace oil.

Due to a lack of up-grades by the local assemblers, the majority of locally assembled bikes carry Euro 2 compliant engines, which had been discontinued in the world some three decades back, he explained, urging the government to devise a policy for getting rid of obsolete old bikes to improve air quality and control smog.

Amid the lack of any government monitoring, bike assemblers have been rolling out 30-40-year-old models without making a complete model change, and only fuel tank stickers and indicators have been changed.

Courtesy Daily Dawn

Navigating continuing financial challenges

Pakistan's electricity supply companies caused a staggering Rs660 billion loss to national exchequer in last fiscal year; inefficiencies of electricity supply companies are draining national resources

Mohiuddin Aazim

Pakistan's electricity supply companies caused a staggering Rs660 billion loss to the national exchequer in the last fiscal year ending June 30, 2024, according to a recent report. To put this in perspective, this amount is 11 times the federal government's Rs59.7bn budget for higher education last year. This comparison starkly highlights the depth of the structural problems afflicting Pakistan's power sector.

The inefficiencies of electricity supply companies are draining national resources, leaving little fiscal space for the government to invest in the economic welfare of Pakistan's 241 million citizens. While the power sector reforms are underway, even the most optimistic policymakers acknowledge that eliminating these losses is unlikely in the near future.

The inefficiencies of power companies, which lead to significant annual financial losses, create a snowball effect on the economy. They add to the mounting circular debt, further constrain fiscal space, drive frequent energy price hikes, and hamper industrial production. This not only reduces output but also makes goods more expensive, exacerbated by prolonged power outages.

Among the worst affected are small and medium enterprises, small shopkeepers, and information technology (IT) freelancers — a crucial source of much-needed foreign exchange — who rely on uninterrupted electricity and internet services to work from home or modest offices.

Unless the government accelerates reforms in the power sector and effectively addresses internet service disruptions, IT professionals will continue to emigrate

As of December 2024, Pakistan ranks a dismal 198th globally in internet speed, trailing behind countries like Palestine, Bhutan, and Libya, according to the World Population Review. Frequent disruptions in internet services further compound the difficulties faced by IT professionals, many of whom are now relocating to nearby Dubai in search of better facilities.

Unless the government accelerates reforms in the power sector and effectively addresses internet service disruptions, IT professionals will continue to emigrate, and export-oriented businesses will struggle to remain competitive in global markets due to high energy costs. This poses a serious threat to sustaining the growth momentum in exports of goods and services.

In the first five months of this fiscal year (July-November 2024), goods exports grew by 12.57 per cent to $13.69bn, while services exports increased by 7.91pc to $2.6bn. Maintaining this growth trajectory is crucial for narrowing the trade deficit. In the first five months of this fiscal year (July-November 2024), goods exports grew by 12.57pc to $13.69bn, while services exports (from July to October 2024) increased by 7.91pc to $2.6bn. Maintaining this growth trajectory is crucial for narrowing the trade deficit.

During July-November 2024, the goods trade deficit stood at $8.65bn, with imports growing by only 3.9pc year-on-year. However, as the economy begins to expand and fuel prices rise amid growing instability in the Middle East, imports are likely to grow faster, putting additional pressure on the trade deficit.

Similarly, the services trade deficit for July-October 2024 totalled $993 million, with imports increasing by 2.41pc. As the economy recovers and is projected to grow by 3pc this fiscal year, according to the Asian Development Bank, services imports are also expected to rise. Thus, faster growth in services exports is essential to keep the deficit in check.

However, challenges remain. Poor performance in wheat and cotton crops threatens to slow the growth of goods exports, while the relocation of IT businesses to Dubai has introduced uncertainty in foreign exchange inflows from this critical segment of services exports.

Remittances from overseas Pakistanis ($14.76bn in July-November 2024) have now become the largest source of non-debt foreign exchange inflows, surpassing goods exports. However, escalating political turmoil in the Middle East, triggered by the fall of Bashar al-Assad's regime in Syria and an immediate Israeli incursion along the Syrian border, presents grave concerns.

With over 55pc of Pakistan's remittances originating from Gulf Cooperation Council countries, it would be optimistic to assume that these inflows will remain unaffected if military escalation spreads to countries like Saudi Arabia or the United Arab Emirates. Any disruption in these key remittance corridors would significantly impact Pakistan's foreign exchange inflows. ■

Competitive Trading Bilateral Contracts Market

Fatally undermined by structural flaws, poor implementation

Energy sector stands ensnared in inefficiencies, financial instability, and a chronic inability to implement meaningful reform; with the combined gas and power sector circular debt now exceeding Rs 5 trillion; power sector bureaucracy must fundamentally reassess its pricing strategies

Shahid Sattar

Writer has served as Member Energy of the Planning Commission of Pakistan & has also been an advisor at: Ministry of Finance Ministry of Petroleum Ministry of Water & Power

Pakistan's energy sector stands ensnared in inefficiencies, financial instability, and a chronic inability to implement meaningful reform.

With the combined gas and power sector circular debt now exceeding Rs 5 trillion, and electricity tariffs among the highest in the world, Pakistan's energy sector is in despair and has severely eroded industrial sectors' competitiveness.

Despite decades of promises, reform initiatives like the Competitive Trading Bilateral Contracts Market (CTBCM) have exposed rather than addressed the sector's systemic dysfunctions. Central to this failure is the absence of competitive and feasible wheeling charges for business-to-business (B2B) power contracts, a key enabler without which CTBCM or any other free-market model is bound to fail.

Indeed, the CTBCM risks being stillborn—ambitiously con-

ceived but fatally undermined by structural flaws and poor implementation.

The role of political economy in shaping Pakistan's energy policies is unmistakable, with vested interests consistently taking precedence over the public good. This entanglement between politics and energy policymaking has derailed critical reforms and skewed priorities to favor narrow agendas. The result is a deeply unsustainable trajectory of the energy sector, marked by stalled projects, half-baked initiatives, and systemic mismanagement that undermines economic progress. For years, reform efforts have repeatedly failed, hamstrung by structural deficiencies and the resistance of entrenched power players benefiting from the current system.

Meanwhile, the country's energy infrastructure is riddled with inefficiencies, theft, and excessive transmission losses. These failings inflate costs and burden the system with unsustainable circular debt. Instead of addressing these foundational issues, policymakers appear content to layer new initiatives over old problems, exacerbating rather than solving the crisis.

The CTBCM aims to shift this model by introducing competition in the electricity market through bilateral contracts and dynamic pricing. Yet, the framework has been burdened with structural flaws, including the contentious inclusion of stranded costs and cross-subsidies in wheeling charges.

The Discos' and CPPA-G's proposed Use of System Charges (UoSC), averaging Rs 27.16/kWh, are far removed from what is economically viable for industries or competitive in global markets. At 9.7 cents/kWh, the wheeling charge alone in Pakistan would be as much as twice the full power tariffs in countries like China, India, Bangladesh and Vietnam.

When challenged on the inclusion of stranded costs and cross-subsidies in wheeling charges, the Power Division entities frequently lean on the argument that these provisions are mandated by the Power Policy.

However, this justification is as unconvincing as it is shortsighted. Policies are not immutable doctrines; they are practical tools designed to evolve with shifting realities. Insisting on treating the Power Policy as a rigid, unchangeable mandate reflects a lack of political will to confront rooted interests and rethink outdated frameworks.

What's more troubling is that the CPPA-G's exorbitant figure raises serious questions about the bureaucracy's commitment to reform. The proposal appears designed to perpetuate the status quo, and discourage reform rather than enable it.

Moreover, CTBCM must include the option of a hybrid setup—allowing consumers to draw power from both private suppliers and the grid. This would preserve grid reliability while prioritizing competitive wheeling arrangements. Such a policy can foster a more balanced energy market and help mitigate the rigidity and inefficiency currently plaguing Pakistan's energy governance.

Another critical issue is that Pakistan's regulatory framework lacks the resources and expertise to oversee a reform like the CTBCM. Regulatory bodies in lower-income countries often operate with significantly fewer resources than their developed counterparts, leaving gaps in enforcement, oversight, and transparency.

Implementing the CTBCM without first strengthening regulatory institutions risks compounding existing problems. The plan calls for the creation of multiple new organizations, which could easily devolve into avenues for patronage and waste, with leadership positions awarded based on connections rather than competence. Instead of fostering competition, such a setup would exacerbate existing inefficiencies and deepen the financial strain on the energy sector.

Similarly, the reduction of the cross-subsidy from Rs 240 billion to an estimated Rs 75-100 billion is a notably welcome step toward alleviating the financial burden on industrial consumers.

To address these challenges holistically, the power sector bureaucracy must fundamentally reassess its pricing strategies. Stranded costs and cross subsidies must not be included in the wheeling charge if it is to be made financially viable for B2B power contracts.

Finally, implementing a robust regulatory framework is crucial to ensuring transparency, equity, and efficiency across the energy sector, laying the groundwork for sustainable reform.

It should be crystal clear to all stakeholders involved that without market-driven and financially viable wheeling charges, the CTBCM is doomed to fail. These charges are the backbone of any functional electricity market, and their absence renders the promise of competition a hollow illusion, ensuring that the CTBCM will remain an exercise in futility rather than a pathway to meaningful reform. ■

KAPCO appoints Shahab Qader as new CEO

EU Report

The Board of Directors of Kot Addu Power Company (KAPCO) has announced the appointment of Shahab Qader Khan as the Chief Executive Officer (CEO) for a term of three years. His tenure will officially commence on January 22, 2025, and conclude on January 21, 2028.

This decision underscores the company's commitment to fostering strong leadership to drive strategic growth and operational excellence. Khan brings a wealth of experience and expertise to the role, ensuring the company remains at the forefront of the power generation sector. The Pakistan Stock Exchange (and relevant stakeholders have been duly informed to disseminate this significant update. ■

Building economic resilience in Pakistani cities

Dr Muhammad Babar Chohan

The writer is a civil servant holding a PhD

Pakistan must shift focus from land investments to knowledge-based services for sustainable growth

The 12th session of the World Urban Forum took place in Cairo from 4 to 8 November 2024 focusing on local actions for sustainable cities and communities around the world. Several sub-themes, such as rising living cost, unaffordable housing, lack of basic services, climate change and regional conflicts, were discussed. Speakers from 70 countries, including cabinet ministers, city mayors and senior urban managers, came together to present the future urban visions of their respective cities and countries. Can Pakistan present a competitive urban vision on such a platform? And what urban values can Pakistan showcase internationally? The answers to both questions revolve around the notion of urban sustainability which directly depends on cities' abilities to promote macroeconomic resilience both in the short and long run.

In August 2024, ADB released a report 'Pakistan National Urban Assessment: pivoting toward sustainable urbanization' which notes Pakistan is at a critical urban juncture. Urban agglomeration, which could act as driver of economic and social development, is challenged by such factors as declining quality of life, failing public services and flagging economic productivity. Unbridled smog in big cities like Lahore has further dragged the quality of life to the lowest ebb. Under such challenges, building economic resilience in Pakistani cities is technically a complex task.

Economic resilience is all about cities' abilities to cope, recover and reconstruct after economic shocks. It is because cities are primarily factories of urban creativity where past, present and future practices meet defining their socio-economic perception. The concept of resilient cities is associated with the notion of territory which is a repository of cultural memories of generations that have lived there and left their economic and cultural imprints. This suggests that the economic evolution of cities remains a distinguished treasure of business practices, trade, knowledge, social values, art, culture and right use of resources. Cities, as factories of urban creativity, therefore, either start contributing to the exponential growth of GDP or restrict it at all. These factories contribute to economic growth and GDP only when cities have an anthropological relationship with humans who inherently define the socioeconomic processes following the principles of functionality, utility, harmony and beauty. In other words, these four principles define the power relations within cities where both powerful and powerless stakeholders interact. Wider debates are usually instrumental in strengthening the functionality of cities alongside creating social harmony which intrinsically shapes up urban beauty and ultimately contributes to economic growth. Lack of debate on urban issues, however, reflects that the powerful stakeholders have hijacked the cities administratively resulting in diminishing urban utility, non-functional businesses, sociocultural disharmony and ugly urban landscape. In such a case, cities start restricting economic growth as is the case with Pakistani cities today.

To develop a cogitating link between cities and economic growth, let's look into the vacillating components of GDP and their relationship with the earlier mentioned four principles. GDP is like a closed box in which monetary inflows and outflows take place. Spendings by common people and government, investments and net exports are inflowing while taxes are outflowing components. The relationship between inflowing and outflowing components is interconnected and cyclical in nature. This suggests more public spending is

largely a result of functionality and utility of cities generating more taxes for the government spending. All of them together result in increasing the quantum of GDP. However, urban hijacking of Pakistani cities by the powerful has shifted the basic business focus from entrepreneurship to investments in immovable resources such as urban lands.

The management of urban lands in Pakistani cities could be developed as a case study to discursively understand imbalanced power relations between the powerful and powerless stakeholders of cities. The urban lands of almost all major cities of Pakistan have been seized by the powerful housing societies whose basic expertise is to maintain economic status quo. Wider economic development, benefitting common people, simply doesn't suit them. As a result, all major cities of Pakistan have started restricting economic growth because of social disharmony and lesser functionality of businesses. Imbalanced power relations have created economic disequilibria thus curtailing the quantum of consumer and government spending and investment. Consequently, imbalanced inflowing and outflowing components of GDP are further aggravating the power relations among various urban stakeholders.

Imbalanced power relations adversely affect territorial value creation processes as well. If Pakistani cities want to act as engines of economic growth, they will have to encourage public debates on various urban issues. The sustainability of urban functionality and utility is dependent on the principles of cooperation, value co-creation and wealth generation. Urban wealth can only be generated when corresponding territories could act as genius loci, a soul and an identity. This way the traditional focus of Pakistani cities will deviate from real estate businesses to knowledge-intensive service businesses (KISB) and manufacturing sector.

Economic development is all about perception of cities and urban centres. Pakistan needs to get rid of parochial interpretations of administrative and legal rules and regulations. The country will have to devise micro level urban processes capable of addressing the issues faced by the deprived strata of society. Shifting the focus from investments in land development to KISB can practically empower women as well. Liberating hijacked cities of Pakistan from redundant rules and regulations, powerful mafias and business status quo created by real estate businesses needs to be the top priority.

Dictatorial policy practices must be curbed immediately. Cities are meant for the people and only people can transform them into engines of economic growth and economically resilient urban centres. ■

Boosting energy sector

Powering Pakistan: bridging gaps in sustainability

Ahad Nazir

The writer, an associate research fellow at Sustainable Development Policy Institute, is heading the SDPI Centre for Private Sector Engagement

Pakistan's energy sector is at a precarious intersection of availability, affordability and sustainability. Addressing these critical dimensions is imperative for fostering economic growth and social equity. The absence of a synchronised approach across these nodes has entrenched systematic inefficiencies, undermining national progress. To navigate this maze, Pakistan must adopt structural and systematic reforms tailored to its unique challenges.

The foundation of a robust energy framework rests on policy coherence and technological alignment. Pakistan lags in this regard. A persistent gap between policy and technology hinders the deployment of adaptive and agile solutions.

Regulations often fail to keep pace with evolving technological interventions, leaving the country unable to capitalise on global advancements. This disjointed approach creates a ripple effect, hampering progress in renewable integration and energy market liberalisation.

The introduction of solar energy, hailed as a cornerstone of sustainability, has inadvertently amplified socio-economic disparities. While some high-income households have reaped the benefits of solarisation, lower-income groups remain excluded. Recent reductions in solar equipment prices have marginally improved inclusivity. However, the divide persists. Pakistan can counter this imbalance through alternative financing mechanisms targeting pro-poor models, enabling equitable access to solar energy.

A comprehensive approach should prioritise local production and assembly of solar components. Over-reliance on imports has subjected the market to exchange rate fluctuations and international price shocks. Grid infrastructure represents another Achilles' heel in Pakistan's energy sector. Chronic under-investment has stymied capacity expansion, leaving significant portions of the population underserved. Strengthening grid networks and investing in micro-grid solutions could dramatically enhance accessibility, particularly in remote and underserved areas. These decentralised systems, combined with renewable energy sources, offer a pragmatic pathway to bridging gaps in energy access. Wind energy, while promising in potential, requires careful contextualisation within Pakistan's energy landscape. Horizontal axis turbines, prevalent in global markets, demand substantial investment and land use, often making them less viable for off-grid or captive power arrangements.

A broader challenge lies in the structural reform of Pakistan's electric power market. A deregulated, multi-buyer-multi-seller model could revolutionise energy trading, fostering competition and improving service quality.

Policymakers must weigh these limitations against the unique needs of local industries and communities to optimize wind energy deployment where it aligns with national priorities.

Stakeholder engagement, spanning government, private sector and civil society is equally crucial. Collaborative frameworks can align diverse interests, fostering consensus and accelerating implementation.

At the heart of these reforms lies the need to make energy affordable for all segments of society. While market mechanisms can drive efficiency, they must be complemented by policies that shield vulnerable populations from price volatility. Subsidies, when targeted effectively, can play a pivotal role in achieving this balance. The stakes are high. Energy availability underpins industrial growth, export competitiveness and job creation. Affordability ensures social equity. Sustainability safeguards the environment for future generations. Pakistan cannot afford to address these dimensions in isolation; an integrated, multi-pronged strategy is the only viable path forward.

To achieve this vision, policymakers must transcend short-term fixes and embrace long-term solutions. Investment in renewable energy, grid modernisation and domestic manufacturing must be paired with innovative financing models and regulatory agility. Fostering a culture of accountability and transparency, ensuring that reforms translate into real-world impact is equally important.

Energy sector transformation is not merely a technical challenge; it is a test of national resolve as well. With concerted efforts and a clear vision, Pakistan can turn its energy crisis into an opportunity, powering a future that is inclusive, resilient and sustainable.

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An energy strategy conundrum

Energy sector is not driven by market forces but by government decisions; With the shutting of gas for captive power plants, there is less likelihood that large industries will switch to the grid; 'Super Six' wind power plants have strained energy sector financially

Afia Malik

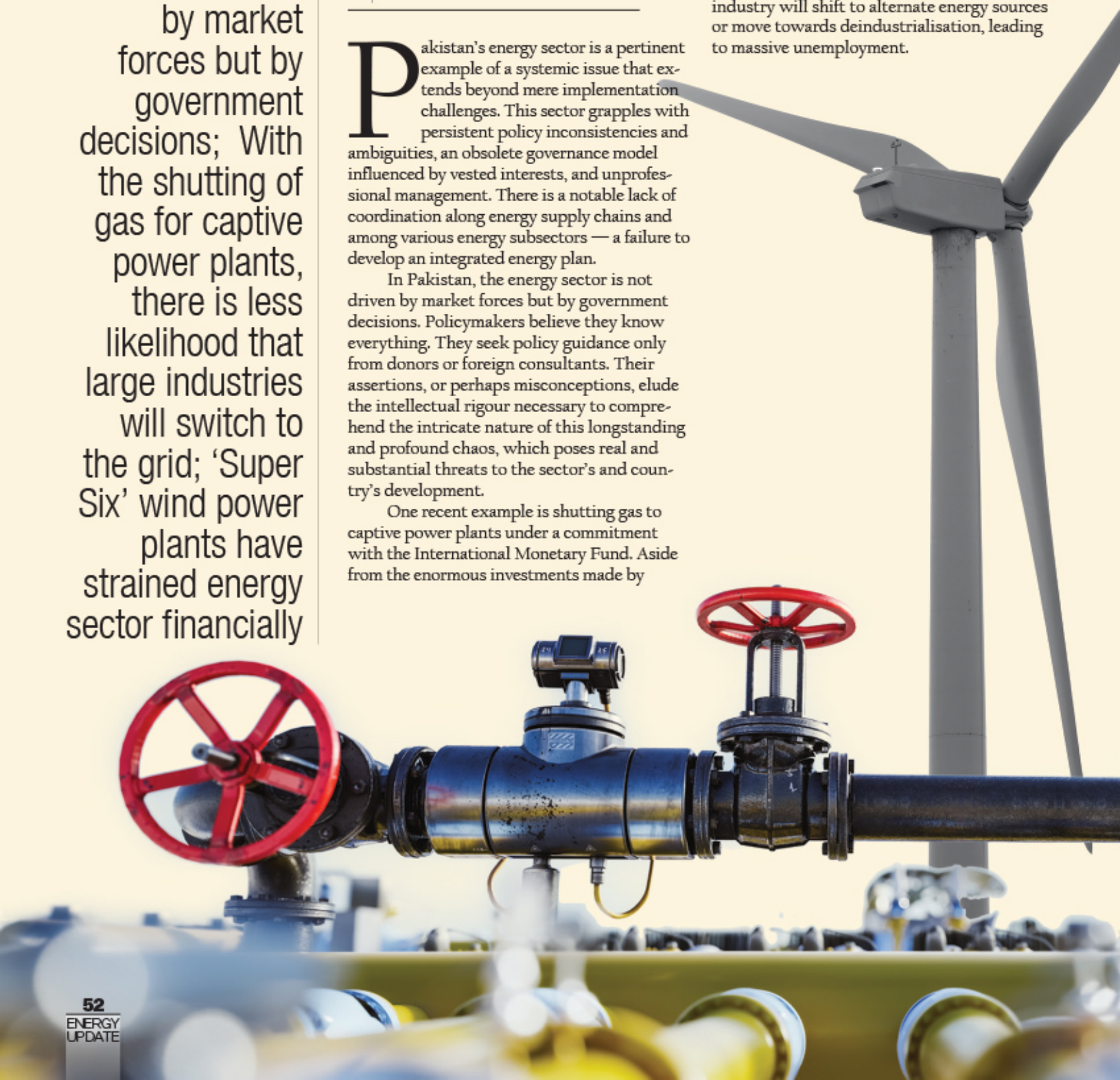
The writer is a Senior Research Economist at the Pakistan Institute of Development

Pakistan's energy sector is a pertinent example of a systemic issue that extends beyond mere implementation challenges. This sector grapples with persistent policy inconsistencies and ambiguities, an obsolete governance model influenced by vested interests, and unprofessional management. There is a notable lack of coordination along energy supply chains and among various energy subsectors — a failure to develop an integrated energy plan.

In Pakistan, the energy sector is not driven by market forces but by government decisions. Policymakers believe they know everything. They seek policy guidance only from donors or foreign consultants. Their assertions, or perhaps misconceptions, elude the intellectual rigour necessary to comprehend the intricate nature of this longstanding and profound chaos, which poses real and substantial threats to the sector's and country's development.

One recent example is shutting gas to captive power plants under a commitment with the International Monetary Fund. Aside from the enormous investments made by the industry over the years in captive power plants, these plants are a source of reliable supplies for the industry and keep the industry globally competitive. The industry depends on these plants for 60 per cent to 80pc of its energy demand. These captive power plants sometimes meet 100pc of the electricity demand.

Industrial grid defection is on the rise with the increase in solar captive plants. With the shutting of gas for captive power plants, there is less likelihood that large industries will switch to the grid. Rather, the industry will shift to alternate energy sources or move towards deindustrialisation, leading to massive unemployment.



Though a competitive trading model has been developed, its implementation remains stalled by policy inconsistencies

Over the years, rather than prioritising the maintenance and efficient utilisation of existing capacity, the emphasis has remained on new projects, resulting in costly excess capacity. Inadequate investments in downstream transmission and distribution infrastructure have significantly worsened these issues. Damaged networks, theft, little to zero modernisation, and insufficient energy accounting result in over 25pc electricity losses.

Poorly conceived projects like the 'Super Six' wind power plants, approved in 2019 under the influence of the International Finance Corporation, have strained the energy sector financially. Despite excess capacity and inadequate infrastructure for evacuating electricity from the wind corridor, these plants were allowed. Consequently, these wind projects and other plants in the wind corridor in Sindh qualify for the Net Project Missed Volume, adding to the financial burden on consumers.

Furthermore, though a Competitive Trading Bilateral Contract Market (CTBCM) model has been developed, its implementation hinges on establishing a justifiable wheeling cost. Introducing the CTBCM offers a promising future for the sector. However, when the wheeling charge tries to cover stranded costs or cross-subsidies, it will not be acceptable or viable for market participants.

Decision-makers must recognise that the industry is moving away from the grid due to uncompetitive tariffs, even without power wheeling. This shift places an additional burden of capacity payments on the remaining consumers. Furthermore, as industrial consumers exit the grid, utilities lose revenue, ie transmission and distribution (T&D) margins previously collected from these customers. Even if stranded costs are not allowed, utilities can recover this revenue by allowing power wheeling.

In the tariff determination for FY25, 49pc of capacity payments go to government-owned plants. Instead of renegotiating contracts with independent power projects (IPPs), the focus should be on these government plants to bring them for trading in the market. The emphasis on IPPs from 1995 and 2002 is unlikely to affect capacity payments significantly and may harm future investment in the country. It was written earlier that these IPPs agreed during power purchasing agreement renegotiations in 2020-21 that once CTBCM is implemented, they will transition towards the market from the take-or-pay clause. Implementing CTBCM and bringing these plants to the market will reduce the burden of capacity payments.

For a long time, the pricing of energy, encompassing both gas and electricity, has been shaped significantly by sociopolitical objectives rather than grounded in economic fundamentals. Cross-subsidy has resulted in the redirection of resources from productive sectors like industry and commercial to non-productive sectors, such as the residential sector. Furthermore, the argument that allowing power wheeling would harm the subsidised domestic sector may only be valid in the short term. A wheeling is just the initial step. Establishing a market trading platform and competition in the retail market would ultimately benefit all consumers.

Recently, a new (conditional) winter tariff package to boost grid electricity consumption is expected to have little impact in the three months. Likewise, decreasing buying rates from net-metering consumers will not bring back defected consumers (industry, residential, or any other). The only viable option left is to develop a competitive energy market where all consumers pay according to the service costs.

CLEAN ENERGY

Enhancing Financial Viability of Pumped Storage Hydropower

Dr JehanZaib Nasir

As Pakistan advances towards a clean energy future, the challenges of integrating renewable energy sources into the grid highlight the need for innovative solutions. Pumped Storage Hydropower (PSH) emerges as a proven technology to enhance grid stability and optimize energy generation.

Retrofitting existing conventional hydropower (CH) plants with PSH capabilities can unlock significant economic and environmental benefits, positioning Pakistan to meet its energy and climate goals.

Renewable energy sources like wind and solar are inherently variable. PSH provides scalable energy storage to balance supply and demand, reducing curtailment and improving grid reliability.

Pakistan is uniquely positioned to retrofit PSH into existing infrastructure. Retrofitting PSH projects can optimize generation, cut capital costs by 16-19%, and reduce project risks and timelines considerably. PSH reduces reliance on fossil fuels, lowers greenhouse gas emissions, and supports global climate targets. Furthermore, optimized energy storage creates opportunities for cost savings and revenue generation. Innovative. By using natural water streams to reduce pumping energy, retrofitted PSH systems can achieve significant energy savings, such as a 166 GWh/year reduction (20%).

Combining Floating Solar Photovoltaics (FPV) with PSH and CH enhances clean energy output, minimizes evaporation losses, and reduces the levelized cost of energy storage (LCOS) by 16%. FPV on reservoirs reduces evaporation and increases water availability for agriculture. Utilizing existing dams for PSH minimizes land use and infrastructure costs. Sustainable water and energy management contribute to climate resilience and agricultural productivity.

Implement incentives like subsidies and carbon credit mechanisms to encourage investment. Conclusion Retrofitting Pumped Storage Hydropower with existing conventional hydropower plants in Pakistan is not just a technical upgrade—it's a paradigm shift. By harnessing these technologies, Pakistan can achieve its energy transition goals while addressing critical WEFE challenges. ■

Huasun Solar Hosts Landmark Golf Tournament to Promote Green Energy

Huasun Solar's inaugural Golf Tournament on December 28th united 80 industry leaders to champion renewable energy. The event, highlighted by a ceremonial shot from Mr. Rana Abdul Jabbar, saw Haval Pakistan, led by Mr. Ammar Hameed, emerge victorious.

A key outcome was nearly 20 MW in solar project commitments, including a 5.7 MW agreement with Haval Pakistan. Closing the event, Mr. Rana Farhan emphasized Huasun's dedication to sustainability with the theme, "Green Energy, Green Game, Green Pakistan."

The tournament successfully promoted solar adoption and collaboration for a greener future.

Solar Brain and Solis organized Technical Training sessions in different cities. Chairman PSA and Managing Editor EU M. Naeem Qureshi is seen with team of Solar Brain.

Amica Energy Achieves Billion-Rupee Milestone

Amica Energy Pvt Ltd has reached a significant milestone, crossing 1 billion in revenue. This achievement highlights the company's dedication, the trust of its partners, and the continued support of its customers.

The milestone marks a step forward in Amica Energy's journey of innovation and growth, with the company aiming for even greater accomplishments in the future.

Diwan International Participated in Peshawar Solar Show. Mr. Faaz Diwan giving special souvenir to Advisor to KPK CM Barrister Saif.

Longi and Diwan International organized a CSR activity by giving Solar Systems to underprivileged communities in Lahore.

CM Punjab Launches Free Solar Panel Scheme for Energy Relief

Chief Minister Punjab Maryam Nawaz Sharif has unveiled a free Solar Panel Scheme aimed at reducing electricity costs for households across the province.

Speaking at the launch, the Chief Minister announced that 100,000 homes will receive solar panel systems, with a total project cost of Rs10 billion. Eligible households consuming an average of 200 units of electricity per month on a single meter can apply. The solar systems, available in 550-watt and 1100-watt configurations, will be distributed through balloting in June 2025. "The initiative will bring substantial relief to electricity consumers and transform Punjab into a hub for renewable energy," said the Chief Minister. She also emphasized plans to gradually convert agricultural tube wells to solar energy and introduce 100,000 e-bikes for students and e-buses, paving the way for a sustainable and eco-friendly transport system.

This landmark project underscores the government's commitment to renewable energy and reducing reliance on conventional power sources.

Diwan International organized a dinner in honor of solar community in Peshawar.

Doctors, Lawyers, and Climate Change: Understanding the Nexus

Barrister Sarah Kazmi

The writer is the Co Chair of the Climate Change Committee at the Islamabad High Court Bar Association

The Climate Change Committee (CCC) of the Islamabad High Court Bar Association (IHCBA), in collaboration with the Ministry of National Health Services, Regulations & Coordination, organized a lecture titled "Understanding the Climate Change-Health Nexus in Pakistan."

The event was held at the IHCBA Lecture Hall to examine the critical intersection of climate change and public health. The climate change committee at the bar aims to promote climate literacy among lawyers as climate change affects diverse practice areas now, including health law.

Dr Raza Zaidi, a public health expert and E4H Technical Director at UK's Evidence of Health Programme, delivered a compelling lecture emphasizing the need for legal reforms to address the climate-health nexus. He elaborated on the role of atmospheric pollutants and the emergence of climate-sensitive illnesses such as heat-related conditions, vector-borne diseases, and waterborne infections.

Dr Zaidi also discussed the impact and strain climate change places on public health systems. He summarized the objectives agreed upon at recent COPs, including COP26, COP28, and the most recent COP29, which outlined priority actions to place health at the heart of climate solutions.

He humorously pointed out the traditional tension between doctors and lawyers but acknowledged the essential role of legal professionals in providing the legislative cover required for effective enforcement of health and climate-related initiatives.

Waiza Rafique from the National Commission on the Status of Women (NCSW) raised a critical question on whether vulnerable groups, particularly women, were being adequately considered in Pakistan's climate-health objectives and policymaking.

Ahmed Kamal, a young lawyer, highlighted research suggesting that every dollar invested in primary and preventative could yield savings of up to $90 in tertiary care, particularly in developing countries. Ahmed further drew an interesting analogy from the landmark case of Rylands v. Fletcher (1868), linking the principle of strict liability established in the case to the context of climate change.

Barrister Shoaib Razzaq, Advocate Supreme Court, emphasized the importance of building the capacity of legal professionals involved in international negotiations, such as COPs.

The Role of Lawyers in the Climate-Health Nexus

In my presentation, I highlighted the critical roles lawyers can play in addressing the climate-health nexus: Draft and propose comprehensive laws that integrate climate change considerations into health sector regulations. Lawyers can hold stakeholders accountable for environmental degradation and climate-related health impacts. Push for reforms that align Pakistan's public health framework with climate action goals, ensuring sustainability and resilience. Lawyers can collaborate with health professionals, policymakers, and civil society to develop integrated approaches for tackling climate and health challenges.

Drawing on global examples, such as Australia's Climate Change Act 2017, Germany's Climate Adaptation Act 2024, and France's Climate and Resilience Act 2021, I emphasized how globally, legislative action is being taken to address climate consideration in the public health space

Dr Zaidi's concluded his presentation emphasizing the critical need for legal reforms to address the intersection of climate change and public health. His key points were: Sensitization and awareness raising among multi-sectoral stakeholders through the 'One Health' approach; collaboration for evidence generation for climate resilient health systems- for proposing effective adaptation measures; and governance measures for creating an enabling environment including legislative reforms.

'One Health' approach for Implementation of Reforms

It became clear to the audience that lawyers play a pivotal role in shaping policies, drafting legislation, and ensuring accountability in addressing the climate-health nexus. The Secretary of the Islamabad High Court Bar Association, Shafqat Abbas Tarrar, appreciated the active participation of the audience and the Ministry of National Health, and he encouraged events like this lecture that foster collaboration between professions.

The Climate Change Committee of the IHCBA is dedicated to promoting climate literacy among legal professionals and building partnerships with stakeholders across various sectors. We invite professionals and organizations interested in collaborating on climate and health-related initiatives. ■

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