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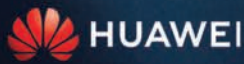
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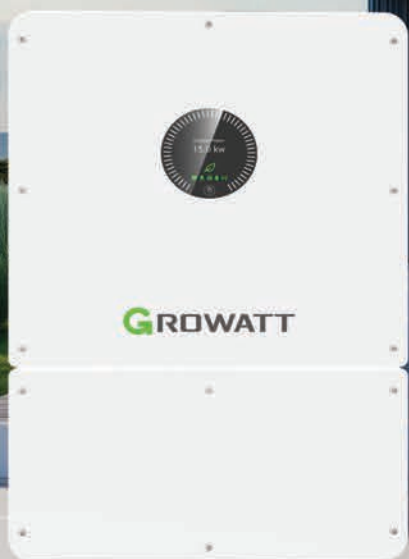
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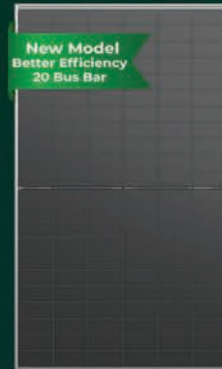
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FROM THE Editor's desk...

ENERGY UPDATE

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New gas connections amid gas loadshedding

In a significant move, Prime Minister Shehbaz Sharif recently announced the reopening of new gas connections after a ban of nearly four years. Earlier, the federal cabinet decided in September to lift the ban on domestic gas connections and supply regasified liquefied natural gas (RLNG).

The decision is a welcome move as it will resume domestic gas connections nationwide demand. However, there is a need to realise it this year as gas is direly needed across the country, particularly in rural areas. Point to be noted is here that RLNG is some costlier than indigenous gas, while the Petroleum Minister stated it is 30-35% cheaper than LPG (cylinder gas). It is significantly higher than the average domestic system gas tariff. New consumers will face a much higher monthly bill while new connection charges have been drastically revised upwards. Consumers may now have to pay an estimated Rs40,000 to Rs50,000 for a new connection, compared to much lower rates previously.

The new connections will primarily be for the supply of Regasified Liquefied Natural Gas (RLNG) to domestic consumers across the country. The government has stressed that this move will allow the public to access an affordable and reliable source of fuel for cooking and heating, which had become a major challenge following the ban.

The demand for new connections is particularly felt in the service areas of the two main gas companies Sui Northern Gas Pipelines Limited and Sui Southern Gas Company Limited. The lifting of the ban is especially crucial in areas where alternative fuels are expensive or where the public has been relying on more traditional, and often less efficient, cooking and heating methods. By providing new connections, the government aims to alleviate this pressure and offer a cleaner energy source to households nationwide.

The ban on new domestic connections, imposed in 2021, was a direct result of Pakistan's rapidly depleting local gas reserves. The country's gas production is simply no longer sufficient to meet the massive and growing demand across all sectors. To manage the ambitious rollout, the government has directed the Sui gas companies (SNGPL and SSGCL) to establish dedicated Project Management Offices (PMOs) and streamline the application process, including launching online applications.

The success of the policy, however, will be judged not merely on the number of connections provided, but on the government's ability to ensure a sustainable and affordable supply without causing a greater strain on the energy sector's finances or worsening winter gas shortages for the nation. It will also be good to end gas loadshedding in Karachi and other parts of the country along with new gas connections besides raising gas pressure to standard level so that people could take a sigh of relief.

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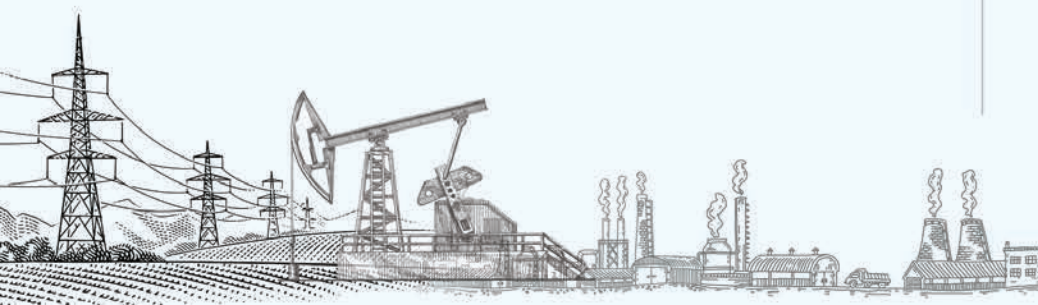
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LPG bowsters: Pakistan's moving safety challenge

Engr Rahil Ihsan Pitafi

The Writer is Director of OGRA

Liquefied Petroleum Gas (LPG) has become an indispensable component of Pakistan's energy supply, providing a vital bridge fuel for millions of households and industries beyond the reach of the national gas grid.

As indigenous gas reserves continue to decline and energy demand rises, LPG offers a cleaner, portable, and more accessible alternative to traditional fuels such as biomass and kerosene.

However, the reliability and safety of this vital energy chain hinge on a fleet of road tankers, commonly known as LPG bowsters that transport the fuel from terminals and refineries to storage and filling plants nationwide. While these bowsters enable nationwide access, their operation poses significant risks that require rigorous technical and safety compliance, given LPG's highly flammable nature.

Understanding LPG and its hazards

LPG, a mixture of propane and butane, is stored as a liquid under pressure. Upon release, it expands rapidly into a heavier-

than-air gas that can accumulate in low-lying areas, forming explosive mixtures with air. With an expansion ratio of 1:250 from liquid to vapor, even minor leaks can turn catastrophic if not swiftly contained. Pakistan's safety codes mirror international benchmarks such as ASME Section VIII and NFPA 58, which define design, construction, and operational standards for LPG pressure vessels and transport systems. Adherence to these standards is the foundation of safe LPG movement.

The LPG bowster: a mobile pressure vessel

An LPG bowster is not a conventional vehicle; it is a mobile pressure vessel engineered for high-pressure containment, typically designed for a working pressure of about 17.2 bar (250 psi) and hydrostatically tested up to 26 bar (375 psi). Each unit integrates critical safety components such as emergency shut-off valves, pressure relief devices, excess flow valves, roto gauges, and grounding systems to prevent static discharge. Bowsters operating in Pakistan must be manufactured by OGRA-registered fabricators and certified by the Department of Explosives. Built with high-grade steel and subjected to strict inspections, these vehicles form the backbone of the LPG logistics network.

Regulatory oversight: a multi-agency framework

Pakistan's LPG transport sector operates under a multi-agency framework involving OGRA, the Department of Explosives, the National Highway Authority (NHA), and Regional Transport Authorities (RTAs).

OGRA issues transportation licenses under the LPG (Production & Distribution) Rules, 2001, ensuring safety and operational compliance. The Department of Explosives handles registration and certification of pressure vessels. NHA enforces axle load and road-worthiness regulations, while RTAs oversee vehicle fitness certification.

While the existing regulatory structure provides comprehensive coverage, relevant transport associations have highlighted the need for greater coordination between the Department of Explosives and OGRA, as both are involved in safety-related licensing. Industry stakeholders and policymakers alike stress that harmonization of roles could enhance efficiency, reduce duplication, and support a more streamlined national licensing framework. Currently, OGRA caps bowser capacity at 30 metric tonnes (with a 15% allowance). The unregistered bowsters operating outside regulatory oversight represent a latent risk to public safety, infrastructure, and the environment.

Safety, training, and inspections

Under Ogra's mandate, periodic inspections and third-party certifications are mandatory for all LPG transporters. Safety relief valves, fire extinguishers, and



emergency shut-offs are checked regularly. The Authority has also issued detailed Standard Operating Procedures (SOPs) for safe loading, unloading, and parking of bowzers to minimize potential hazards.

Driver training remains another critical aspect. Ogra, in collaboration with the National Logistics Cell (NLC), organized specialized driver training programs covering firefighting, emergency response, and ethical conduct. Drivers are the first responders on the road, and empowering them with the right skills ensures that safety begins behind the wheel.

Understanding the risks: BLEVE and beyond

Among the most catastrophic scenarios is a Boiling Liquid Expanding Vapor Explosion (BLEVE), triggered when an LPG vessel exposed to external heat undergoes structural failure. The explosion and resulting fireball can devastate everything within a large radius. Preventive measures such as maintaining safe distances, regular valve inspections, and ensuring firefighting readiness are crucial to mitigating such outcomes.

Emergency preparedness and public awareness

Public awareness forms the final layer of defense in the LPG safety chain. In case of leaks or fires, communities must understand how to react: evacuate downwind, avoid ignition sources, and alert emergency services immediately.

The tragic Multan incident in January 2025, which caused multiple fatalities and widespread damage, highlighted the dire consequences of delayed evacuation and limited public knowledge. Since then, OGRA has enhanced coordination with provincial disaster management authorities, Rescue 1122, and local governments to improve community preparedness through awareness drives and mock emergency drills.

Towards a culture of safety: recommendations and best practices

LPG bowzers are essential to sustaining Pakistan's energy accessibility, but their safe operation is a shared responsibility. Continuous collaboration among OGRA, the Department of Explosives, NHA, RTAs, and local authorities is key to ensuring consistent safety enforcement and public protection. A policy shift towards harmonization of roles, mandatory electronic tracking of bowzers, and enhanced enforcement of fitness and licensing standards will further strengthen the sector's integrity. Simultaneously, promoting a safety-first mindset within the LPG industry, from operators to drivers, can transform the entire supply chain into one driven by accountability and prevention.

Conclusion: from hazard to safety culture

As LPG's role in Pakistan's energy mix grows, the safety of its road transport network must remain paramount. Every bowzer represents not only an energy carrier but also a public safety responsibility. By aligning with global best practices, enhancing coordination among regulators, and strengthening public awareness, Pakistan can turn potential hazards into a culture of safety and confidence.

Through shared responsibility, continuous vigilance, and harmonized regulation, LPG bowzers can move beyond being perceived as "hazards on wheels" to becoming symbols of safety, reliability, and national energy resilience. ■

EVENT REPORT

Pakistan Seeks Russian Investment at St. Petersburg Gas Forum

EU Report

Pakistan's Oil and Gas Development Company Limited (OGDCL) took center stage at the 14th St. Petersburg International Gas Forum (SPIGF) 2025, as Federal Minister for Petroleum Ali Perviz Malik led

the country's delegation with a mission to deepen energy ties and attract Russian investment in Pakistan's oil, gas, and minerals sectors. During a key meeting, Malik and Alexey Miller, Chairman of Russian energy giant Gazprom, agreed to strengthen collaboration between OGDCL and Gazprom, aiming to unlock new opportunities in exploration and development. At a high-profile plenary session, Malik outlined Pakistan's sweeping energy sector reforms and investor-friendly policies, crediting Prime Minister Shehbaz Sharif's leadership for the sector's transformation. He emphasized Pakistan's openness to foreign investment and highlighted new prospects in the country's resource industries. On the sidelines, Malik also met with senior officials from Rusgeo, the Russian Geological Survey Company, and Nedra Digital, an AI energy firm, to discuss potential Russian investments in Pakistan's mineral and energy resources. Additionally, the minister held talks with Türkiye's Minister of Energy and Natural Resources, Alparslan Bayraktar, to explore avenues for broader regional cooperation. ■



SNGPL grants pipeline access to UGDC

EU Report

In a landmark development for Pakistan's energy sector, Sui Northern Gas Pipelines Limited (SNGPL) after granting pipeline access to Universal Gas Distribution Company (UGDC), has enabled the country's first private gas marketing firm to begin supplying natural gas to industrial clients starting 12:01am on Tuesday (October 14), reveals the notified decision issued by Sui Northern on Monday evening. The decision by SNGPL board to grant pipeline capacity to UGDC, finalised on October 9 after prolonged delays, marks a critical step towards liberalising Pakistan's traditionally state-controlled gas market. "Yes, UGDC is going to transport gas to its clients from the early hours of October 14, 2025," confirmed Ghiyas Abdullah Paracha while speaking to this scribe. He said that with this decision, industrialists will be able to access gas as fuel at competitive rates, helping reduce input costs. Under the revised Access Agreement, UGDC has been allocated 50 million cubic feet per day (mmcf) of capacity through SNGPL's pipeline network—25 mmcf on a firm basis until 2033, and an additional 10 mmcf on an interruptible basis for six months. The company will source gas from the Razgir Gas Field in District Kohat, part of the TAL Block, operated by a consortium comprising MOL Pakistan, OGDCL, PPL, GHPL, and POL. ■

Malady of Power Sector

Let's rewire the grid in Pakistan

Power sector today stands at the edge of both crisis and opportunity; the country pays billions of rupees annually in capacity payments for idle megawatts that never reach consumers

Khalid Waleed

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

Pakistan's power sector today stands at the edge of both crisis and opportunity, a paradoxical intersection where oversupply coexists with scarcity, and excess capacity burdens coexist with unmet demand.

The country pays billions of rupees annually in capacity payments for idle megawatts that never reach consumers, even as industries face power cuts and households brace for unaffordable bills. At the same time, solar panels are blooming across rooftops, signaling a quiet revolution of distributed energy. Yet the system's regulatory mindset, still rooted in the 20th century, treats this transformation as a threat rather than a triumph.

It is in this context that the 2025 Nobel Prize in Economic Sciences, awarded to Joel Mokyr, Philippe Aghion and Peter Howitt, carries extraordinary relevance. Their collective work on innovation-driven creative destruction offers both an explanation of the past and a roadmap for Pakistan's future.

Creative destruction, in Schumpeter's timeless phrase, is the process by which new technologies, enterprises and ideas continually displace the old, driving long-term growth. Mokyr, Aghion and Howitt expanded this into a complete theory of economic evolution, arguing that progress is not linear accumulation but perpetual renewal.

As Aghion's models demonstrate, sustained prosperity depends on allowing obsolescence and innovation to coexist in a cycle of

disciplined turbulence. This is not chaos but choreography. But when incumbents use political influence to block this renewal, societies sink into what Aghion calls the incumbency trap. Pakistan's power sector, with its debt-laden coal plants and take-or-pay contracts indexed to inflation, exchange rate and interest rate, epitomises this trap. It has become a system that protects old rents instead of producing new value.

The imported coal plants, once symbols of a solution to energy crises and industrial modernity, now resemble the very monopolies Schumpeter warned about: yesterday's innovators turned rent-seekers. Their guaranteed payments have become a fiscal burden, while their environmental costs deepen Pakistan's vulnerability to climate shocks. The challenge, as the Nobel laureates would phrase it, is not to preserve these incumbents but to govern their creative destruction.

The early retirement of coal power plants must therefore be understood as a shift from static to dynamic efficiency. It frees up fiscal space, unlocks resources and redirects human and financial capital towards the technological frontier, distributed renewables, battery storage and digital grid management. This reallocation reflects Aghion and Howitt's central insight: growth occurs when capital and talent move continuously from declining sectors to expanding ones.

Seen through this lens, rooftop solar becomes the frontier of innovation. Like start-ups in a competitive market, prosumer systems represent the insurgent force of creative destruction, small, agile and decentralised. They empower citizens to become producers, reduce transmission losses and democratise energy ownership. Yet, just as Schumpeter's entrepreneurs face resistance from entrenched



monopolies, Pakistan's solar adopters face regulatory suspicion, arbitrary policy changes, and attempts to dilute net-metering. This conflict between incumbents and innovators is the essential friction through which progress occurs. Suppressing rooftop solar is akin to protecting the candle industry from the light bulb.

To harness this wave, Pakistan must shift from the protectionism of the old to the facilitation of the new. Regulators should treat distributed generation as a public good, not a private nuisance. That means digitalising metering infrastructure, offering fair time-based tariffs and enabling prosumers to sell excess electricity transparently through grid-based markets. In short, creative destruction must be governed, not gagged. The path forward is to channel competition where it fosters innovation and regulate where it stabilises the system, what Aghion describes as staying on the 'inverted-U' of optimal rivalry.

The solar boom sweeping through Pakistan presents also a challenge of intermittency. Here lies another frontier of innovation, sodium-ion batteries – the next chapter in the global story of energy storage. Unlike lithium-ion batteries, which rely on expensive and geopolitically constrained materials such as lithium and cobalt, sodium batteries are cheaper, safer and more sustainable. Most importantly, Pakistan possesses abundant sodium resources embedded in its massive salt reserves at Khewra, Warcha in Punjab, and Bahadur Khel in Khyber Pakhtunkhwa.

This geological blessing positions the country to leapfrog into a new segment of the clean-tech value chain, local manufacturing of sodium-ion batteries for stationary storage, electric vehicles, and rural microgrids. By developing sodium battery industries, Pakistan could reduce import dependence, stabilise solar generation through affordable storage and create green industrial jobs. A sodium-based storage ecosystem, coupled with a solar boom, could become the cornerstone of Pakistan's Schumpeterian renewal.

But perhaps the most profound shift must occur in how Pakistan conceives its grid itself. The 'National Unified Power Grid' was built for an era when electricity flowed in one direction, from massive, centralised plants to passive consumers. That philosophy belongs to the age of accumulation; the future belongs to the age of innovation. In the 21st-century paradigm, the grid must evolve into a National Integrated Power Platform, an intelligent, interoperable ecosystem where power flows both ways, data flows freely and every household, industry, or microgrid can interact dynamically. This new grid should not be a command-and-control network but a digital

marketplace, linking renewable generators, storage providers, industrial clusters and households through real-time pricing, open access and carbon-market linkages.

Such transformation requires not just engineering but governance reform. The system must move from central dispatch and uniform tariffs to open platforms, localised markets and flexible pricing. It must prioritise transparency over hierarchy and interconnectivity over control. As Aghion argues in 'The Power of Creative Destruction', institutions must adapt to sustain innovation cycles, not fossilize around obsolete models. For Pakistan, that means restructuring the grid from a monopoly of transmission to a marketplace of participation, where flexibility, rather than rigidity, becomes the source of reliability.

In practical terms, this Schumpeterian energy transition calls for what the laureates term the "investor-insurer state". The state must invest in birthing the new, through R&D support, innovation funds and mission-oriented financing, and ensure against the pains of the old's decline. Establishing a Coal Transition Fund, financed by carbon credits and green bonds, could ease the fiscal burden of early retirement while reskilling workers and repurposing plant sites.

Parallel efforts should promote net-metered industrial clusters that absorb excess capacity into productive use, develop regional microgrids in agricultural and industrial zones integrating solar, storage and EV charging, and implement carbon pricing to rechannel incentives from fossil inertia toward renewable creativity. Integrating sodium-ion battery manufacturing into these policies would allow Pakistan not only to store its sunlight but to export its technological prowess, turning salt into energy security.

What emerges from this vision is a tale of renaissance. Early coal retirement and rooftop solar are not opposing forces – they are twin movements in the same symphony of progress. The first makes room; the second fills it, hence the sunrise on rooftop solar and sunset on coal plants. The grid, reimagined as a platform rather than a pipeline, conducts the orchestra through 'Independent' System and Market Operator (ISMO) and National Grid Company (NGC). Pakistan's energy transition must not be a donor-driven compliance exercise but a home-grown expression of creative destruction, a deliberate, disciplined process of letting go of what no longer serves in order to build what must.

As the Nobel Committee observed, "Economic growth cannot be taken for granted. We must uphold the mechanisms that underlie creative destruction, so that we do not fall back into stagnation". The same is true for Pakistan's power sector. The choice before us is stark yet simple: cling to an expensive past or choreograph a sustainable future. ■

Biogas: untapped solution to rural energy

As fuelwood demand drives deforestation, expanding biogas systems in rural areas is only effective solution

Dr Muhammad Khurshid

The writer holds a PhD in forestry and has served with provincial, national and international organizations in forestry, climate change and environmental management

Studies and observations show that rural households continue to rely on fuelwood and animal dung as their main sources of domestic energy. It is estimated that per capita fuelwood use is 0.52 m³ in the warm plains and 0.72 m³ in the colder mountain areas of Pakistan. Therefore, a family of 10 consumes about 5.2 m³ of fuelwood in the plains and 7.2 m³ in hilly regions. This is a phenomenal burden on forests that may lead to deforestation.

Pakistan has planted billions of trees over the past decade and now a nationwide Green Pakistan initiative is underway across all provinces, including Azad Jammu and Kashmir and Gilgit-Baltistan. However, these efforts are undermined by the continuous cutting of forests for domestic fuel, which remains a persistent pressure on forestry resources. Several alternatives to fuelwood have been tried in the domestic sector, but most failed due to high prices, limited accessibility, poor supply chains, or inconsistent supply. Liquefied petroleum gas (LPG), natural gas, kerosene, and LNG are efficient energy sources, but their high costs and restricted distribution, limited mainly to urban areas, have kept them out

of reach for rural communities.

Biogas offers an economically viable, socially acceptable, and environmentally friendly alternative. A rural household with one or two animals, as is common in Pakistan's villages, can easily establish a biogas plant. Being decentralised, these plants can be installed near the source of animal dung. The process, which is anaerobic digestion of organic material, can be facilitated through a biogas digester. The latest dome-shaped underground digesters are fully automatic and more efficient than the older drum-type designs. As bacteria decompose organic matter inside the digester, biogas is released as a highly effective energy source.

The composition of biogas varies depending on the raw material and operating conditions such as temperature, pH, and substrate concentration. Typically, it contains Methane (CH₄) 50-75%, Carbon Dioxide (CO₂) 25-50%, Nitrogen (N₂) less than 5%, Hydrogen (H₂) less than 1%, Oxygen (O₂) less than 1%, Hydrogen Sulfide (H₂S) traces under 3%, and Water Vapour (H₂O) under 10%. Methane, which has a high calorific value, serves as the primary source of heating.

Biogas is socially acceptable because it offers significant health benefits. It eliminates indoor pollution caused by burning wood and dung cakes, reducing respiratory illnesses. It also minimises exposure, especially for children, to waste heaps of animal dung that attract flies and germs. For rural women, who are primarily responsible for collecting firewood and cooking multiple meals daily, biogas provides immense relief

and improves quality of life, making its gender dimension particularly strong.

Economically, biogas is highly viable. Once established, a biogas plant can last more than two decades. After the initial cost is recovered, households effectively enjoy free energy. The average replacement value of biogas for fuelwood or LPG per household is around Rs15,000 per month. Additionally, the digested residue from biogas plants serves as rich organic manure, improving soil fertility and reducing dependence on chemical fertilisers. Biogas use also lowers healthcare costs by reducing sickness. Biogas is environmentally friendly as it helps control tree cutting for fuelwood. It consists of 50-70% methane, often referred to as the "monster" of greenhouse gases (GHGs) due to its warming potential, which is nearly 80 times higher than that of other GHGs. Additionally, biogas technology reduces indoor air pollution, promotes health and hygiene by decomposing dung heaps, and qualifies for carbon credits as an anaerobic process.

This renewable source of domestic and commercial energy also reduces the consumption of fossil fuels, LPG, and kerosene oil. Therefore, biogas energy is highly sustainable over time and across regions, offering multiple benefits for both rural and national economies.

Despite its social, economic, and environmental advantages, biogas has yet to gain adequate attention from policymakers or be promoted on a large scale. Pakistan, being the world's fifth-largest livestock-producing country, must prioritise the development of biogas plants at both national and local levels.

The federal and provincial governments should actively encourage and promote biogas adoption. All relevant agencies must work to expand biogas development in rural areas. Instead of extending natural gas pipelines to these regions, decentralised biogas plants, at both household and community levels, should be promoted.

While planting trees is relatively easy, protecting them until maturity is a far greater challenge. Since the demand for fuelwood remains the main pressure on forests, this can only be addressed effectively by developing biogas systems in Pakistan's rural areas. ■





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Pakistan has immense renewable potential — the challenge is to turn that potential into predictable investment conditions

H.E. INA LEPEL,
German Ambassador to Pakistan

Raziq Shah and Halima Khan

As the world moves decisively toward renewable energy and climate resilience, Germany's remarkable "Energiewende" — or energy transition — stands as a global benchmark for clean, efficient, and sustainable power systems. With its longstanding commitment to green transformation, innovation in solar and wind technologies, and robust development cooperation, Germany continues to inspire countries seeking to decarbonize their economies.

In Pakistan, where the need for energy diversification and sustainable growth has never been greater, Germany has been a key partner in advancing renewable energy, promoting energy efficiency, and supporting climate adaptation initiatives. Through its agencies such as GIZ and KfW, Germany has launched numerous projects that strengthen Pakistan's capacity in renewable generation, grid modern-

ization, and environmental protection.

In this insightful conversation, H.E. Ina Lepel, Ambassador of Germany to Pakistan, discusses how Pakistan can shape its own version of the Energiewende, the ongoing and upcoming German-supported projects in the country, and the future of bilateral cooperation in achieving shared climate and energy goals.

Q 1. Germany has been a global leader in renewable energy transformation. How do you see Pakistan's potential in adopting Germany's "Energiewende" (energy transition) model to accelerate its shift toward clean energy?

Ambassador: Germany's Energiewende (Energy Transition) is a comprehensive framework aimed not only at shifting the country's energy consumption towards clean and renewable sources but also at enhancing energy efficiency across all sectors to reduce overall energy demand. It provides valuable lessons learnt for Pakistan's energy planners; however,

it must be adapted according to the needs and potentials of Pakistan's economy and cannot be copied and replaced as such. Pakistan has great renewable potential, especially in solar PV, wind, hydro etc. However, in order to reduce demand for energy, Pakistan also requires a stable regulatory framework to trigger private investment in renewable energies and energy efficiency technology.

To accelerate transition to a clean energy mix, some challenges are

- Fix energy sector inefficiencies
- Restore investor confidence and most importantly,
- Resolve the issue of circular debt.
- Another challenge is to promote and create predictable investment conditions.

Following a whole of society approach, Pakistan should chart its own versions of an Energiewende suited to its economic conditions and institutional realities.

Q 2. Can you share any ongoing or upcoming German-supported projects in Pakistan's renewable

energy, climate resilience, or green technology sectors?

Ambassador: The government of Germany, through its Development Cooperation, supports public, private and civil society organizations at three levels:

1. at the macro level through policy and regulatory development at the federal level.
2. at the meso level through engagement with provincial authorities to strengthen their technical and institutional capacities, and
3. at the micro level through infrastructure projects or pilot demonstrations showcasing practical solutions and their business cases for upscaling.

There are currently 26 projects under implementation in the technical cooperation sphere through GIZ and under financial cooperation through KfW. These initiatives include policy and regulatory support as well as renewable energy and energy efficiency interventions including expanding energy access through hydropower and solar PV installations. Decarbonizing power grids through digital solutions and developing low emission development strategies is another important field. Our cooperation also supports climate resilience solutions and adaptation measures in various economic sectors, skill development and green jobs creation. In future, the German Development Cooperation is committed to continuing to work for sustainable development in Pakistan.

To give you specific examples: In RE, we are financing the rehabilitation of the Warsak hydropower plant close to Peshawar and micro-hydel in the North. We are also supporting solar home systems for poorer households through micro-credit scheme. In Khyber Pakhtunkhwa, we are supporting the afforestation efforts in order to make the region more climate resilient.

Q.3 Germany is known for its innovation in solar and wind technologies. Are there any initiatives under discussion to promote technology transfer or investment partnerships with Pakistan's private sector?

Ambassador: There are initiatives to promote technology cooperation, leveraging knowledge transfer, capacity building and investment opportunities under the Pakistan Germany Climate and Energy Partnership (PGCEP). German companies such as Siemens and Nordex were

among the first to collaborate with Pakistan's private sector in developing the country's first utility scale wind farms along the coastal areas of Sindh. The interest of the German companies declined in past years for several reasons, primarily related to the political and economic uncertainties in Pakistan. However, given the fact the Pakistan has made some progress in these challenges, a growing trend among German companies towards entering the Pakistani market is observed recently. The German Pakistan Development Cooperation will extend full support and coordination efforts to transform these expressions of interest in practical investments and joint ventures. In all the infrastructure projects that Germany is funding the construction and delivery of goods and services is tendered, thereby providing a chance also for Pakistani companies to participate.

Q.4 Given the global urgency on climate action, what role do you envision for German-Pakistani cooperation in achieving the UN Sustainable Development Goals, especially in energy access and environmental protection?

Ambassador: German-Pakistani cooperation under the umbrella of PGCEP is playing a pivotal role in advancing the UN Sustainable Development Goals, particularly SDG7 on affordable clean energy, SDG 13-Climate Action and SDG 9- Industry, Innovation and Infrastructure, e.g Digitization and Decarbonization of Power Grids. The technical expertise and financial support, channeled through GIZ and KfW is supporting Pakistan through multi-layered approach to expand RE, energy efficiency in various sector of economy and to prepare provincial institutions and communities for climate resilience and adaptation. By combining German innovation with Pakistan's growing interest in energy transition and climate resilience both countries have the potential to accelerate this process by triggering the private



A group picture of Halima Khan & A Raziq Shah with H.E Ina Lepel.

sector investment, which is also instrumental for environment protection.

A concrete example is our funding of projects that provide households in the northern part of the country with RE from hydropower sources, so that those people do not need to cut trees anymore to meet their energy demands, which also protects the environment. Another example is our support for a sustainable afforestation management in KPK. We are not only financing the plantation of trees but also the establishment of value chains from forests to markets so that the local communities can harvest fruits and nuts and sell them. This way, not only is the environment protected, but also the revenues of the local population increase as well.

Q 5. How can German companies be encouraged to invest more in Pakistan's renewable energy market, particularly in solar, wind, and hydrogen sectors?

Ambassador: To attract greater German investment in Pakistan's RE market, the Government of Pakistan should ensure policy stability, transparent regulations and timely payments to address investors' risks. Furthermore, there is room for improvement in streamlining the approval processes. Demonstrating pilot concepts in emerging energy technologies, and a fully functional competitive energy market providing affordable electricity will further build investors' confidence. Establishing a transparent and trustful business environment and promoting business-to-business (B2B) joint ventures would greatly encourage German and international investment. ■



Small dams – lost water potential

Small dams are easier, faster, and cheaper to build and maintain

Engr Hussain Ahmad Siddiqui

The writer is retired Chairman of the State Engineering Corporation

Pakistan faces an acute water crisis that continues to deepen due to prolonged neglect of small and medium-sized dam projects.

Fifteen years after their launch, eleven out of twelve multipurpose dams across all four provinces remain incomplete—despite billions of rupees already spent. This long delay is costing the national economy heavily each year, while both federal and provincial governments remain largely indifferent.

At a time of growing water scarcity and looming food insecurity, Pakistan has lost the capacity to cumulatively store about 3.20 million acre-feet (MAF) of water annually. Had these small dam projects been completed, they could have irrigated over 0.38 million acres of additional land. Originally scheduled for completion within three to four years, these projects have been left to decay, depriving the country of vital water resources.

Project financing

The twelve projects were approved during 2009–2010 as multipurpose reservoirs in

remote areas with favourable topography and rainfall patterns. The Executive Committee of the National Economic Council (ECNEC) cleared these schemes at a total cost of around one billion US dollars.

China had pledged \$700 million in soft-term loans through the China Eximbank, covering 70 percent of the total cost, while Pakistan was to contribute \$300 million in local currency.

Fifteen years later, however, only one dam—Darawat—has been completed and that too at thrice its original cost. Several projects never even broke ground despite tenders being issued during 2009–2010. Pakistan has already spent over Rs 69 billion on six under-construction or stalled projects, while costs have surged by nearly 250 percent. The situation worsened when the China Eximbank withdrew its financial support due to repeated delays and weak execution of these projects.

Mismanagement and institutional apathy

Rampant mismanagement, corruption, and the absence of political will have crippled the construction programme. Successive governments have failed to ensure timely release of funds, effective monitoring, or cost control. Though allocations were made under the Public

Sector Development Programme (PSDP), many projects were left unfunded. As a result, a crucial national priority has been consistently overlooked.

The 12 dams included Winder, Naulong, Hingol, Pelar, and Garuk in Balochistan; Nai Gaj, Darawat, and Sita-Khadeji in Sindh; Ghabir and Papin in Punjab; and Bara and Daraban Zam in Khyber Pakhtunkhwa. Of these, Sita-Khadeji was allocated Rs 41 million in the 2011–12 PSDP (public sector development plan) but was later dropped due to “financial constraints.” Bara in Khyber District never took off owing to funding shortages and security concerns, while Daraban Zam in Dera Ismail Khan remains dormant at the redesign stage. Hingol underwent major redesigns and is now partly financed by the Abu Dhabi Fund.

Funding for Pelar was stopped in 2011, and Garuk has been under construction since 2019. Ghabir and Papin remain stalled following the withdrawal of Chinese financing, while Nai Gaj and Naulong are still incomplete. Details are given in Table below.

Unused potential and climatic consequences

The urgency of these projects has been highlighted repeatedly by the devasta-

tion caused by seasonal floods—exacerbated by climate change—which destroy lives, infrastructure, and farmland. Small dams could play a critical role in storing excess rainfall and conserving water for dry months. Beyond flood control, their benefits include improved food security, groundwater recharge, and sustainable local water availability.

Pakistan currently has about 142 small and medium-sized dams: 64 in Balochistan, 28 in KP, 23 in Punjab, 22 in Sindh, 3 in Islamabad, and 2 in Gilgit-Baltistan. Yet there has been no major expansion since 1996 despite an estimated potential for another 750. Many provincial projects remain mired in bureaucratic inefficiency and poor resource management, even though technical expertise exists within provincial Small Dams Organisations.

Preference for mega projects

One major reason for the neglect of small dams is policymakers' persistent bias toward large, high-visibility water projects. Large dams, while politically attractive, are expensive, socially disruptive, environmentally risky, and often take more than a decade to complete. Since Tarbela, no major dam has been finished, though Diamer-Bhasha, Mohmand and Dasu are under construction.

The contrast in cost is striking: twelve small dams in the Potohar region were completed in 1996 for just \$35 million, whereas Diamer-Basha alone will cost an estimated \$14 billion (excluding its power generation component). Globally, too, the number of large dams constructed each year has declined sharply—from about 500 in the 1980s to roughly 100 in the early 2000s—reflecting a worldwide shift toward smaller, community-based storage solutions.

The case for small dams

Small dams are easier, faster, and cheaper to build and maintain. They can be constructed with local materials and labour, reducing dependence on imported technology. Examples such as Rawal, Simli, and Misriot in the Rawalpindi-Islamabad region, and Tanaza in Fateh Jang, show how such reservoirs can effectively meet urban and suburban water needs. While small dams cannot entirely replace large multipurpose projects, they are an essential complement. They help expand irrigation, secure drinking water, recharge groundwater, and even generate low-cost electricity. Bara Dam is designed to produce 5.8 MW, Nai Gaj 4.5 MW, and Naulong 4.4 MW, with several others planned for smaller outputs.

The way forward

Despite once being water-rich, Pakistan is now among the most water-stressed nations on earth, partly because nearly half of its irrigation water is wasted through poor management and inadequate infrastructure. Enormous volumes of rainwater flow into the sea each monsoon, untapped and unused.

The construction of small and medium-sized dams is therefore no longer optional—it is an urgent national imperative. The government must act decisively to revive and complete these stalled projects by mobilizing domestic resources and seeking renewed international assistance. Any further delay will deepen the water crisis, undermine food security, and waste a vital opportunity to secure Pakistan's sustainable development. ■

ENERGY NEWS

PPL forges energy partnership with Turkish company



EU Report

Pakistan Petroleum Limited (PPL) has signed a strategic partnership with Turkish Petroleum Overseas Company (TPOC), initiating a key development in the farm-out process for Eastern Offshore Indus Block-C. PPL said that this collaboration stems from inter-governmental discussions aimed at fostering energy sector collaboration and attracting foreign direct investment into Pakistan's offshore exploration industry. The company has agreed to hand over the block's operatorship to TPOC, pending regulatory consent. This step is part of a broader initiative to align Pakistan's offshore exploration practices with international standards.

Alongside this, PPL has involved Oil & Gas Development Company Limited (OGDCL) and Mari Energies (MariEnergies) in the farm-out process. Following comprehensive due diligence by these companies, a farm-out agreement was executed that includes PPL, TPOC, OGDCL and MariEnergies. According to the terms of the farm-out agreement, PPL will allocate a 25% participating interest (PI) and the operatorship to TPOC, while OGDCL and MariEnergies will each receive a 20% PI.

PPL will maintain a 35% PI and remain instrumental in the ongoing development of the block. ■

Global warming is pushing planet to the brink: UN chief

EU Report

The United Nations Secretary General Antonio Guterres has warned that global warming is pushing the planet to the brink and urged countries to implement disaster warning systems to protect people against extreme weather. "Every one of the last ten years has been the hottest in history. Ocean heat is breaking records while decimating ecosystems. And no country is safe from fires, floods, storms and heatwaves," he told delegates at the UN World Meteorological Organisation's extraordinary conference in Geneva to mark its 75th year. "They give farmers the power to protect their crops and livestock. Enable families to evacuate safely. And protect entire communities from devastation," Guterres said. Getting notice 24 hours before a hazardous event can reduce damage by up to 30pc, he added. Over 60pc of countries have introduced multi-hazard Early Warning Systems since Guterres launched an initiative in 2022 for all countries to have these in place by 2027. ■

Decision to restart Jamshoro LPG plant operations is highly beneficial

Associated Group Chairman says the plant revival project will add US \$100 million to Pakistan's foreign exchange reserves, create around 5,000 jobs, and generate Rs 2 billion in net income for SSGC; **Iqbal Z Ahmed** urges govt to harness Sindh's dormant gas fields for LPG Production

Naeem Qureshi

The Writer is Managing Editor of Energy Update and Environment Activist

The Chairman and CEO of the Associated Group, Mr Iqbal Z Ahmed, a leading name in Pakistan's energy sector, has urged the federal government to utilise the immense potential of dormant gas fields in Sindh for Liquefied Petroleum Gas (LPG) production.

Speaking exclusively to Energy Update, Mr Ahmed praised the government's decision to allow the resumption of operations at the Jamshoro Joint Venture Limited (JJVL) LPG plant. He said that this decision, supported by the Special Investment Facilitation Council (SIFC), Petroleum Ministry, and OGRA, marks a positive shift in energy policymaking that could set the stage for much-needed growth, stability, and investor confidence in the sector.

Energy Update (EU): How do you assess the government's decision to allow JJVL to resume operations?

Iqbal Z Ahmed (IZA): The federal government has taken an excellent and much-needed decision by allowing the JJVL LPG plant to restart operations. The SIFC, the Petroleum Ministry—under the leadership of the Federal Petroleum Minister and Secretary—and the OGRA Chairman have all played a very constructive role.

They understood that this plant had been wrongly shut down, and its closure

caused significant harm to Pakistan's economy. According to our estimates, the five-year closure drained the country's foreign currency reserves by around US \$500 million, caused Rs 10 billion in losses to Sui Southern Gas Company (SSGC), and deprived the government of another Rs 10 billion in taxes. In addition, around 5,000 people lost their jobs, and the LPG market was destabilised.

Major infrastructure projects, especially those in the energy sector involving billions of dollars of investment, must not suffer due to personal vendettas or ill-advised administrative actions. Any adverse action of the government targeting an energy project should never weaken the confidence of investors, as policy instability can seriously undermine the sector's long-term growth.

EU: What are your expectations once the JJVL plant resumes full-scale operations?

IZA: Inshallah, JJVL will soon resume production, and its revival will bring enormous benefits. We anticipate that the project will add US \$100 million to Pakistan's foreign exchange reserves, create around 5,000 direct and indirect jobs, and generate approximately Rs 2 billion in net income for SSGC.

It will also deliver billions of rupees in tax revenues to the national exchequer. We are introducing advanced new technology to further improve efficiency and sustainability. This successful restart shows what can be achieved when public



and private sectors work together in a spirit of cooperation and national interest.

EU: How can Pakistan make the most of its dormant gas reserves, particularly in Sindh?

IZA: The revival of JJVL underlines the huge potential of Sindh's dormant gas fields. We should replicate this success by installing LPG extraction systems at other idle gas plants across the province. These systems can convert off-spec gas into on-spec gas, adding significant value to existing resources.

However, the off-spec gas should be sold only to those industries that are specifically interested in purchasing such an energy product, rather than letting this valuable resource go to waste. My own assessment is that Pakistan can produce around 1,000 tonnes of LPG per day from these dormant plants if we take decisive action.

To realise this, the government and private sector must join hands to pursue a clear, ambitious agenda. The Ministry of Petroleum should take ownership of this mission and work closely with industry leaders. If we succeed, Pakistan can reduce its dependence on imported LPG, save foreign exchange, create jobs, and stabilise domestic prices. This is the path to a self-reliant and sustainable energy future. ■



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Mirza M Hamza

The writer is an economist and an educationist

Bill Emmott in his 2017 book “The Fate of the West” argued how America’s collapse almost certainly triggers the collapse of Western civilization, though he concludes that America will reassert its dominance through US alliances (NATO, Five Eyes) and innovation.

China then genuinely lagged behind,

China had wisely anticipated the importance of rare earth minerals and the coming of the AI age. The words of Deng Xiaoping, who remarked during his southern tour in 1992, “The Middle East has oil; China has rare earths,” reiterate this point. Beijing now processes almost 90 percent of the world’s rare-earth elements (REE), controlling nearly three-quarters of global cobalt refining.

China also leads global lithium production chains. Its latest restrictions on rare earth exports, published as Announcement No. 62 (2025) by the Ministry of Commerce, mark a near-un-

nor did it occur overnight. In 1991, China passed laws designating rare earths as strategic and restricting foreign mining companies from working with local firms. When the US attempted to revive its domestic industry, Beijing flooded global markets with supply, collapsing prices and bankrupting American producers like Moly Corp.

When forced to lift export quotas after a 2014 WTO ruling, China ramped production by 25 percent in 2022, again collapsing prices. Beijing has thus repeatedly used both production quotas and market manipulation to maintain control.

The rare earth race



having only Pakistan as an all-weather ally and lagging far behind the United States in technological and financial innovation. When US Treasury Secretary Scott Bessent recently declared, “It’s China versus the world,” Emmott’s observations strike a chord as the old-world order quickly dissolves with the coming of the AI age.

precedented escalation in the US–China trade conflict. The rule requires foreign companies to declare end use and obtain export permits if their products contain even trace amounts, sometimes as little as 0.1 percent, of rare earth materials sourced from China.

This dominance was not accidental,

The recent escalation has spurred policymakers and think tanks into reassessing what strategic levers each side truly holds. While China has dominance over rare earths, the United States retains what Scott Bessent calls “structural advantages,” from aircraft engines to advanced semiconductors. Yet Beijing’s foresight

in securing critical minerals continues to pay off. Only a handful of firms, like Lynas Rare Earths, operate outside Chinese processing networks.

The Australian company Lynas operates a Malaysian facility bankrolled by Japan despite opposition from Beijing in 2010, and recently signed a non-binding MoU with US firm Noveon Magnetics to build a rare earth magnet supply chain for defense and commercial applications.

With each Virginia-class nuclear submarine requiring roughly 4,600 kilograms of rare-earth elements, and future vessels requiring substantially more, the US remains in a compromised position.

As the escalation has shifted from confrontation to coordination, US Treasury Secretary Scott Bessent and Chinese

enforced its stance. Bundesbank President Joachim Nagel, speaking in Washington, called on the EU to act “in a more offensive way” toward Beijing. These events indicate that both the EU and the US are trying to contain China’s overreach in minerals and manufacturing, with the US using its industrial strength as leverage and Europe relying on its regulatory power.

Together, the Malaysia talks and the South Korea summit will stress-test whether the West can maintain a united front in an emerging world where China and Russia continue to contest Western dominance.

Beijing’s strategy appears to be focused on controlled ambiguity rather than outright confrontation. Its export rule has not been reversed but not fully enforced either. The Commerce Ministry’s statement that “compliant export for civil use can get approval” indicates flexibility on paper while preserving leverage in practice.

The restrictions, set to take effect on December 1, have put immediate pressure on the US government, creating a short window of hope for investors and businesses. Interestingly, in a move to avoid a head-on collision with the US, China has deliberately avoided targeting Taiwan’s chip production directly, since the five newly restricted elements reportedly differ from those used in TSMC’s wafer processes. This suggests Beijing is flexing its muscle with precision rather than aggression.

Washington’s responses, such as tighter audits on Chinese stocks or new investment curbs, appear peripheral compared to Beijing’s which can disrupt entire industries with a single export rule.

Amid this great power rivalry lies a quieter opportunity for Pakistan. The country’s geography, once defined by its borders, may soon be defined by its bedrock. The Reko Diq project in Balochistan, one of the world’s largest undeveloped copper-gold deposits, now sits at the intersection of competing global strategies. Its revival under Barrick Gold, backed by US and Canadian investment, signals Washington’s renewed interest in the region’s mineral corridors.

At the same time, China continues to deepen its footprint through CPEC, extending its logistical reach from Gwadar to the western frontiers of Balochistan.

This dual engagement places Pakistan in a uniquely strategic position. Just this month, Pakistan dispatched its first consignment of rare-earth and critical minerals to the United States as part of its USD 500 million agreement with US

Strategic Metals.

Much like Australia’s Lynas, the crisis has enhanced Pakistan’s strategic value. While China views Pakistan as a corridor to the Arabian Sea under CPEC, the United States now sees it as a gateway to mineral diversification and industrial security.

Managing this balance will require more than diplomacy; it will demand strategic nonalignment built on economic logic.

Pakistan’s policymakers should recognize how minerals are becoming instruments of statecraft. Rather than seeing Reko Diq purely as an extraction project, Islamabad must frame it as an industrial ecosystem, building local refining capacity, attracting neutral partners such as Japan and South Korea, and positioning itself as a processing hub for critical materials.

The objective should be to sell access rather than control. In an era when raw materials shape geopolitical leverage, Pakistan’s minerals can become either a tool of autonomy or a trap of dependency.

For the United States, this is a testing moment when a rival challenges its superpower status. History suggests that when cornered, America innovates. After the Pearl Harbor attack in 1941, the United States mobilized with extraordinary speed, developing radar, jet engines, and the atomic bomb, turning vulnerability into technological supremacy. When Riyadh flooded global oil markets in 2014 to crush America’s shale producers, prices collapsed from over USD 100 to below USD 40. Instead, American firms mastered hydraulic fracturing and horizontal drilling, overtaking Saudi Arabia as the world’s largest oil producer within years.

For Pakistan, this might be a defining moment. The world’s new power struggle comes with crypto, metals, and machines rather than armies or currencies. Pakistan’s USD 500 million minerals deal with Washington and its multi-billion-dollar CPEC infrastructure with Beijing place it at the center of this contest.

The country that emerges stronger will sell access without surrendering control, build refining capacity rather than just extraction sites, and attract neutral partners like Japan and South Korea to balance great power pressure.

The countries that will endure are those that can adapt, balance, and innovate. As America once proved in its shale revolution, survival belongs to those who reinvent resources, not those who merely control them. ■



Vice Premier He Lifeng have decided to meet in Malaysia this week in a bid to defuse the tariff standoff. Their dialogue comes ahead of a higher-stakes summit between President Trump and President Xi in South Korea, where rare earths and Taiwan are expected to dominate the agenda.

At the same time, Europe has sharp-

Energy Vehicle Policy: The Future Is Plugged-In

Vehicle ownership remains low and cars are unaffordable for the majority; large-scale EV adoption in the passenger cars segment seems unattainable

Mohammad Shaaf Najib

The author is a Research Fellow at Pakistan Institute of Development Economics (PIDE)

The Economic Coordination Committee of Cabinet approved the New Energy Vehicle Policy of the country for the years 2025-2030. While the policy is titled as new 'energy' vehicle policy focusing on vehicles using all forms of latest alternate energies either completely or partially, but predominantly the focus of the policy remains on Electric Vehicles.

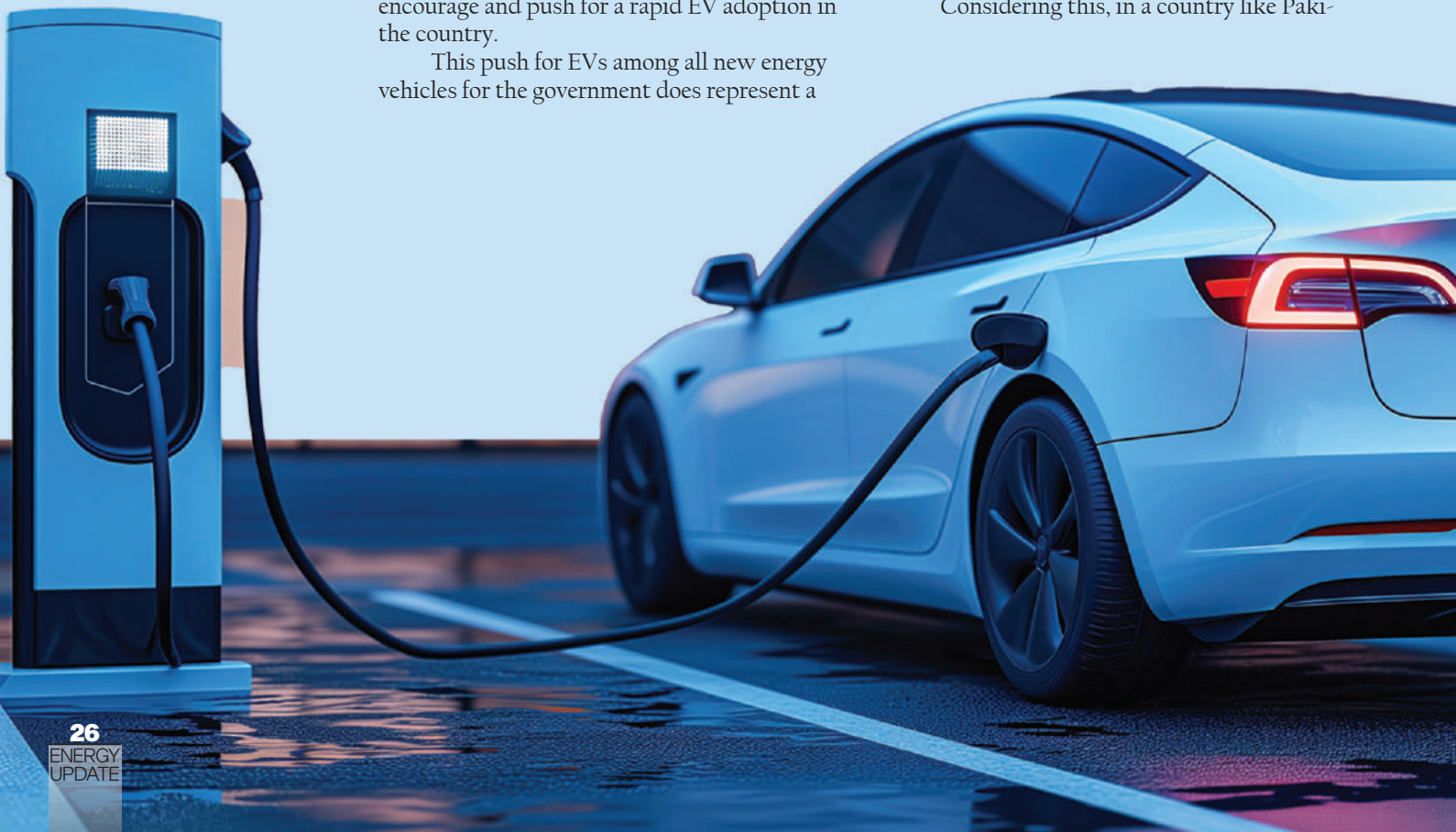
The policy has set highly ambitious, or as in some opinions, highly unrealistic targets for achieving by 2030. Though the views on practicality of the targets set out in the NEV policy, and the shortcomings of it remain an important discussion point, the government's focus is loud and clear. Initiatives such as subsidy for 2-wheeler EV consumers, NEV levy on non-electric passenger vehicles, plans to install fast chargers on national highways and motorways are a clear signal of the government's priority to encourage and push for a rapid EV adoption in the country.

This push for EVs among all new energy vehicles for the government does represent a

degree of disregard towards the ground realities of Pakistan's automobile sector in particular. Pakistan stands as one of the most vulnerable countries to the climate change, and the fuel consumption by the transport sector is one of the major pollutant contributors in the country.

In such a scenario, the transition to EVs presents an opportunity to limit further damage to the environment thus reversing the vulnerabilities of the global climatic changes. The benefit of a successful EV transition for Pakistan is not limited to just the environment and climate. Instead, there is a significant economic benefit attached to it as well. Estimates show that not more than 10% of the households in the country own a 4-wheel passenger vehicle in the country, and having one of the lowest cars per 1,000 people ratio. This makes the transition to EVs a bigger challenge. With EVs costing more than the equivalent combustion engine vehicles, the affordability due to the upfront cost in a low vehicle ownership market like Pakistan's makes the EV target audience even smaller. Further, the lack of commercial charging infrastructure makes inter-city travel on EVs impossible.

Considering this, in a country like Paki-



stan where vehicle ownership remains low and cars are unaffordable for the majority, large-scale EV adoption in the passenger cars segment seems unattainable. In the current scenario, EVs remain a viable option for the limited few households with the affordability of a second vehicle in the price bracket of PKR eight to ten million, or a first vehicle in the price bracket of over PKR 15 to 20 million. These challenges are not unique to Pakistan but common to all low and medium income countries. To date, only high-income countries have successfully managed to transition to a large scale EV adoption in the four-wheel passenger car segment.

So does this mean that countries such as Pakistan should ignore EVs and continue to focus on ICEVs? Certainly not. Instead, the perfect solution for low and medium income countries, and hence for Pakistan, are the Plug-In Hybrid Electric Vehicles (PHEVs).

PHEVs are powered by an electric motor like conventional EVs and an engine like the routine ICEVs. However, unlike HEVs, the PHEVs' batteries are charged not by engine and braking power but need to be charged through an external electricity source just

as any EV.

The size of the electric motor in PHEVs though is much smaller, enabling the car to drive purely on electric power for around 50 to 100 km based on the battery size. Once the electric charging runs out, the PHEV is powered through its fuel-based engine.

As such, the range anxiety that comes along the conventional EVs, i.e., the fear of car running out of electric charging and hence becoming immobile in the middle of the road is eliminated in case of PHEVs as once the vehicle battery charging finishes, the car is run through its fuel engine and hence not hindering the journey.

More importantly, PHEVs allow consumers to drive their average daily commute either entirely or mostly through battery power, while in case of longer journeys particularly inter-city travels, the fuel engine facilitates the journey even without battery charging.

Consequently, the Pakistani government and automobile industry both must focus on encouraging and facilitating the adoption of PHEVs in the country as they will be able to provide a similar environmental and economic benefit as hoped through the transition to EVs without restricting consumer adoption due to limited charging facilities and issues such as range anxiety. While aiming for large-scale Electric Vehicles adoption in the country is a positive and forward looking objective, for Pakistan and other similar countries, the future is plugged-in, so to speak. ■

German Ambassador meets President



EU Report

Ambassador of the Federal Republic of Germany to Pakistan, Ina Lepel, called on President Asif Ali Zardari at Aiwan-e-Sadr, Islamabad.

President Zardari appreciated Germany's longstanding partnership with Pakistan and its continued support in areas of climate action, women's empowerment, social protection, and human development. He highlighted the need for expeditious finalization of the Pakistan-Germany Climate Partnership Agreement, noting that both countries share common goals in addressing global climate challenges.

The President welcomed German investments in Pakistan, particularly in the renewable energy, IT, and industrial sectors, and underlined Pakistan's special incentives for foreign investors. He observed that the early establishment of a Pakistan-Germany Chamber of Commerce in Karachi would further deepen trade and economic ties.

Discussing the strategic dialogue between the two countries, the President welcomed Germany's offer to host the 6th Round of Pakistan-Germany Strategic Dialogue later this year, and appreciated the positive trajectory of bilateral cooperation in regional and international fora.

President Zardari also acknowledged Germany's role in facilitating the Afghan relocation programme and lauded the country's continued support for Pakistan's GSP+ status within the European Union.

The German Ambassador informed the President that this is her third posting in Pakistan and her second tenure as Ambassador. She previously served in Pakistan from 2006 to 2009 and from 2015 to 2019.

Matters related to education, skilled labour mobility, and consular matters also came under discussion. The President expressed satisfaction over the increasing number of Pakistani students pursuing higher education in Germany and called for early resolution of delays in family reunion and business visas. ■





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The impact of solar minigrids in rural Pakistan

Patrick Jowett

A research team based in Italy and Pakistan has examined the socio-technical implications of installing solar microgrids in rural off-grid communities in Pakistan. The research covered three rural communities located near Jahanpur in the Punjab province of central-eastern Pakistan, each predominantly engaged in agricultural activities.

In the village of Bismillah Mor, the researchers conducted a qualitative analysis of a deployed solar-powered minigrid with battery storage, as well as a qualitative study in the area consisting of interviews with stakeholders, focus groups and direct field observations to gather data on how the community exercises ownership and everyday use of the minigrid system. Similar quantitative analysis, consisting of two focus groups and ethnographic observations, was carried out at two additional rural communities in the same area, one in the village of Wal Wala, which is grid-connected but without a microgrid, and another at Hadden Wala, which is grid-connected and also supplied with a solar minigrid.

The researchers found that in Bismillah Mor, the solar microgrid has provided a “partial, yet significant” response to energy poverty, giving the community stable access to electricity for essential domestic needs, including lighting and small household appliances. The microgrid was also found to foster forms of empowerment and emancipation, particularly for women, leading the researchers to conclude that the microgrid is “not merely a technological solution but a potential catalyst for broader social change.”

In Wal Wala, the other community with partial land ownership, access to the national electricity grid fostered a cautious approach to energy consumption, with usage deliberately limited to avoid higher costs, the researchers found. In contrast, in Hadden Wala, where the communities are mostly landowners, better economic conditions have facilitated access to the national grid, in turn influencing material culture.

Ivano Scotti, the research paper’s

corresponding author, told pv magazine the key insight from the study is that energy innovation becomes meaningful and sustainable only once it is socially embedded. He added that factors such as land tenure and property relations play a decisive role in shaping how people understand and engage with new technologies.

Scotti also said the findings revealed that local actors do not passively adopt technology but actively reinterpret, modify, and adapt it to their needs, generating new forms of practical and cognitive ownership.

“In this sense, the success of the microgrid depends on a hybrid governance arrangement that combines formal technical control with informal, socially negotiated ownership and knowledge,” Scotti said. “Overall, the study demonstrates that ‘doing ownership’ – that is, enacting property through daily practices and negotiations – is a key dimension of sustainable energy transitions in rural contexts.”

Scotti added that successfully deploying microgrids – both in Pakistan and other regions of the Global South – depends on recognising that energy infrastructures interact with pre-existing property regimes, local hierarchies and cultural values.

“Technical design must be coupled with capacity building, social inclusion, and governance mechanisms that reflect community structures,” Scotti said. “Strength-

ening local skills, especially among women and technicians, fosters autonomy and long-term system sustainability.”

Scotti suggested that policy frameworks acknowledge the hybrid nature of property rights in rural areas and should enable shared or collective ownership. He also said business models should be context-sensitive and combine affordability with community participation.

“By integrating these social, technical, and institutional dimensions, the deployment of microgrids can move from being a temporary aid solution to becoming a transformative process that enhances local capabilities and supports a just and durable energy transition,” Scotti added.

The group’s findings are presented in the research paper ‘Doing ownership’ in sustainable energy innovation: The social embeddedness of microgrids in rural Pakistan, available in the journal *Energy Research & Social Science*. The research team consisted of social scientists from Italy’s University of Naples Federico II and engineers from Pakistan’s Lahore University of Management Sciences. The two universities are partners of the EU-funded LoCEL-H2 project, a four-year Horizon Europe project that is creating a scalable microgrid system to support rural communities that lack consistent energy sources.

Courtesy PV Magazine



Climate-induced floods and heavy rains cause heavy losses in Pakistan: Report

Special Report by Mansoor

The climate-induced floods and heavy rains have resulted in 946 deaths, including 255 children, and 1,062 injuries, including 320 children across the country, according to a UNICEF Report.

The report says in Gilgit Baltistan (GB), Glacial lake outburst floods have caused 41 deaths, 52 injuries and damage to 1,253 homes, with valleys such as Diamer and Ghizer cut off due to landslides.

In Khyber Pakhtunkhwa (KP), The province has recorded the highest number of casualties, with 504 deaths and 1.57 million people affected.

Punjab: Punjab has seen its worst flooding in decades, with 5.1 million people have been affected, 1.9 million evacuated, and more than 1.05 million acres of farmland inundated and 100 nutrition centers disrupted, putting 5,000 children at risk of malnutrition.

Sindh: By Sept 12, 2025, 68 deaths and 87 injuries have been reported, alongside widespread urban flooding in Hyderabad, Karachi and Mirpurkhas. Fifteen high risk districts have been identified for preventive action.

Response

UNICEF launched a multi sectoral response within 72 hours of the onset of the first flood-related emergency, delivering health, nutrition, water, sanitation and hygiene (WASH), child protection and education support across the affected provinces.

Health: UNICEF delivered over 18 tons of contingency health supplies across GB, KP, Pakistan Administered Kashmir (PAK) and Punjab including essential medicines, Oral Rehydration Salts and zinc.

Nutrition: In KP, 57 Outpatient Therapeutic Programme (OTP) sites were reactivated, reaching 16,489 children. In Punjab, 2,044 OTP sites remain operational, with 100 have been disrupted by the floods.

WASH: UNICEF provided safe drinking water to over 96,000 people in KP and Punjab through water trucking and filtration plants. Support also includes hygiene kits, sanitation items, and efforts to restore water systems.

Child protection: UNICEF provided child protection and mental health and psychosocial support (MHPSS) services in KP and Punjab through mobile safe spaces, Child Protection Units, and strengthened coordination to address emerging risks.

Education: UNICEF supported education continuity for 30,000 flood-affected children in KP; safeguarded assets in 74 schools and set up 11 temporary learning

centres for 1,741 children in Punjab.

Community engagement: Risk communication and community engagement are ongoing in KP and Punjab. UNICEF has to-date reached 160,552 people through community engagement.

Khyber Pakhtunkhwa (KP)

Khyber Pakhtunkhwa remains the hardest-hit province in terms of monsoon flood casualties, with 504 reported deaths, including 90 children, and 218 injuries. The floods have affected an estimated 1.57 million people across 10 districts, with Bajaur, Buner, Shangla and Swat identified as high-priority areas due to extensive damage and limited humanitarian coverage. A total of 4,668 homes and 60 health facilities have been damaged or destroyed, including the residences of Lady Health Workers (LHWs). In Bajaur, some 160,000 individuals already displaced by military operations are now sheltering in camps, schools, or with host communities.

Widespread damage, injury, and displacement heighten psychosocial distress among children and families and, without timely support, may result in long-term mental health consequences. The WASH sector has sustained severe damage, with more than 1,000 water supply schemes affected, of which 464 were destroyed, resulting in widespread open defecation and urgent sanitation needs. Health risks



remain elevated, particularly in Charsadda, where over 725 dengue cases have been confirmed, making it one of the most affected districts and underscoring the sustained risk of waterborne disease outbreaks.

Punjab

Punjab is experiencing its worst flooding in decades, with 5.1 million people affected and 1.9 million evacuated from submerged villages along the Chenab, Ravi and Sutlej rivers. The disaster has already claimed 260 lives (including 98 children) and left 660 injured. Health services have been heavily disrupted, with 100 Outpatient Therapeutic Programme (OTP) centers forced to close, putting around 5,000 children at risk of severe acute malnutrition.

In response, the government has established 727 relief camps, currently providing shelter to more than 6,000 displaced people, alongside 339 medical camps that have treated over 11,000 patients. To address the urgent need for safe drinking water, UNICEF-supported filtration plants are serving an estimated 7,500 people each day, helping to mitigate the threat of waterborne diseases. The situation remains critical in Multan, where an emergency was declared as of 9 September. Some 140,000 people have been affected, with evacuations ongoing and many families still stranded. To prevent

and mitigate risks of long-term psychosocial distress to children, child protection actors are providing psychosocial support and case management services in affected districts.

Sindh

In Sindh, urban flooding in Hyderabad, Karachi and Mirpurkhas has resulted in 68 deaths (including 31 children), 87 injuries, and damage to 91 houses, along with significant crop losses. The Provincial Disaster Management Authority (PDMA) has identified 15 high-risk districts for preventive evacuation and pre-positioning of relief supplies. Heavy inflows of water via the Chenab river and continued rainfall have heightened the risk for further flooding, prompting authorities to remain on high alert.

Gilgit Baltistan (GB)

Gilgit Baltistan has faced a combination of glacial lake outburst floods and flash floods, leading to 41 deaths, 52 injuries, and damage to 1,253 homes. The valleys of Diamer and Ghizer have been cut off due to landslides and damaged infrastructure, severely hindering relief efforts. A large mudslide-formed lake continues to pose a serious downstream flood risk. The GB Disaster Management Authority (GBDMA) has established 11 relief camps, currently accommodating 3,140 people, while continuing road clearance and monitoring operations. ■

ENERGY NEWS

Mari to produce 25,000 bpd in UAE

EU Report

Mari Energies is targeting to produce around 25,000 barrels per day (bpd) of oil from its three discoveries in the Abu Dhabi block. In the company's corporate briefing held on Tuesday to discuss its FY25 performance and the future outlook, the management confirmed that a board meeting was organised with the Abu Dhabi National Oil Company (Adnoc), where the production plan was approved and "the project will now move to the development phase".

Mari management revealed that they were eyeing a production target of around 25,000 bpd from the three discoveries in the Abu Dhabi block. The company reached the highest-ever production level of 39.13 million barrels of oil equivalent (mmboe) in FY25. However, it outlined that gas supply curtailment and an additional 15% royalty resulted in lower earnings during the financial year.

The company has managed to reduce reliance on the Mari field to 80% (compared to 95% in FY20), following new discoveries in Waziristan and Sujawal blocks.

While a deferment plan for liquefied natural gas (LNG) cargoes has been sent to Qatar and is awaiting approval, Mari anticipates a 10-15% decline in production due to curtailment in FY26 if the plan is not approved. It added that part of this risk could be mitigated through third-party allocation, however, it is unlikely to fully offset the impact of curtailment.

Currently, the Shewa gas field has a production capacity of 70 million cubic feet per day (mmcf) while the Spinwam well (set to be added to the same facility) is expected to contribute an additional 30 mmcf initially. Upon full development, these frontier fields are projected to add a further 200 mmcf.

According to the Mari management, it will take around two to three years to push both Spinwam and Shewa to their combined full potential of 300 mmcf. The estimated capital expenditure (capex) on these developments will be \$400-500 million if new equipment is purchased, however, the company is also exploring other alternatives, which may lower the capex level.

Ghazij and Shawal fields are currently undergoing extended testing, contributing approximately 40 mmcf. Combined, the fields have the potential to produce up to 58 mmcf but they are not operating at full capacity and are awaiting allocation. Once the allocation is granted, further development could increase output by 180 mmcf, which is expected to be achieved in 18 to 24 months. ■



NFEH Marks **Pink October** with Breast Cancer Awareness Session

Experts Urge National Cancer Registry and Mass Screening as Cases Hit 92,000 Annually

Ruqiya Naeem

The National Forum for Environment & Health (NFEH) observed Pink October by organizing a comprehensive breast cancer awareness session at a local hotel, bringing together healthcare experts, researchers, and social activists to address Pakistan's escalating breast cancer burden.

Speakers highlighted that an estimated 92,000 new breast cancer cases are reported annually in Pakistan, calling for the urgent establishment of a National Cancer Registry and mass-scale screening facilities to ensure early detection and treatment.

Participants expressed concern that women in rural and underprivileged areas remain largely unaccounted for due to limited diagnostic access, resulting in delayed diagnosis and higher mortality rates. They emphasized that breast cancer carries a 50 percent mortality rate in Pakistan—a figure that can only be reduced through timely screening, public awareness, and strengthened healthcare infrastructure.

Dr. Sara Arif, Head of Surgery at Memon Medical Institute Hospital, noted that existing statistics are based on outdated data and exclude vast rural populations. She stressed the importance of early screening and affordable treatment, pointing out that only a few charitable hospitals currently offer subsidized cancer care.

Dr. Safaf Hafeez Chauhan, Head of the Psychology Department at Salim Habib University, underscored the psychological challenges faced by patients and the need for counseling and emotional support during treatment.

Renowned herbalist Dr. Bilquis Sheikh encouraged women to adopt healthier lifestyles, reduce



From L to R Senior journalist and breast cancer survivor Afia Salam, NFEH Secretary General Ruqiya Naeem, Dr Sara Arif, Head of Surgery at Memon Medical Institute Hospital, Herbalist Dr Bilquis Sheikh, Shakeel Khan from the Arts Council of Pakistan Karachi, Dr Safaf Hafeez Chauhan, Head of the Psychology Department at Salim Habib University, Ruth Zia, Principal of the Nursing College and Syeda Kausar.

processed food consumption, and rely on natural diets to build stronger immunity. Ruth Zia, Principal of the Nursing College, highlighted the role of trained nursing professionals in improving patient care and creating awareness about preventive health practices, especially in rural communities.

Shakeel Khan, representing the Arts Council of Pakistan Karachi, said that artists and cultural institutions have a vital role in raising public awareness through creative expression. He emphasized that theatre, music, and visual arts can powerfully communicate health messages and help break taboos associated with diseases like breast cancer. He assured that the Arts Council would continue to support such initiatives in collaboration with civil society organizations to promote preventive

healthcare and women's empowerment.

Senior journalist and cancer survivor Afia Salam stressed the importance of mass awareness campaigns, citing the failure of the recent HPV vaccination drive in Karachi as a reminder of the need for better public sensitization.

NFEH Secretary-General Ruqiya Naeem shared her personal experience of surviving stage-two breast cancer, attributing her recovery to strong family support and early intervention.

Concluding the session, NFEH President Muhammad Naeem Qureshi reaffirmed NFEH's commitment to nationwide awareness initiatives, saying, "We will continue to hold educational sessions to protect vulnerable communities, particularly women, from fatal diseases through awareness and early intervention." ■

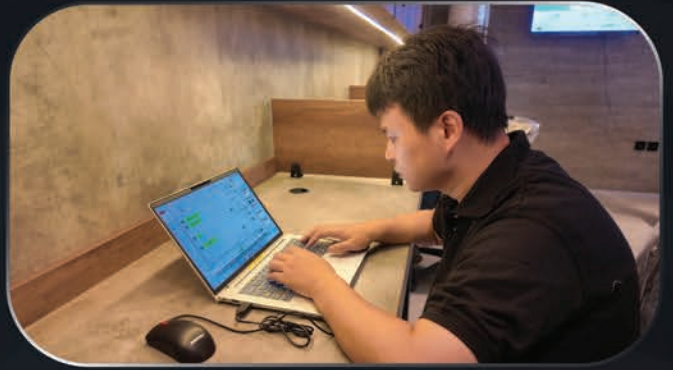


Glimpse of audience



Group Photo of Speakers with organizers.

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Looking towards micro nuclear reactors

Pakistan's energy crisis is not just about power cuts; it is about survival

Yousuf Nazar

The writer is the former head of Citigroup's emerging markets investments and author of 'The Gathering Storm'

Pakistan's energy crisis is not just about power cuts; it is about survival. Every summer, citizens brace for rolling blackouts as peak shortfalls rise into the thousands of megawatts. Behind the flickering lights lies a deeper malaise: circular debt in the power sector that has ballooned into trillions of rupees, an import bill for petroleum that drains over \$15 billion annually, and a grid so inefficient that nearly a fifth of generated electricity is lost before it reaches consumers. This is not an energy system — it is a fiscal black hole.

Successive governments have tried patchwork fixes, but the crisis has only deepened. Today, the installed capacity of Pakistan's power system stands at around 46,000 megawatts, yet average actual generation hovers closer to 14,000 to 15,000 megawatts.

The reasons are depressingly familiar: underutilised plants, poor transmission, losses from theft, and above all, the crush-

ing weight of contracts with independent power producers (IPPs) that guarantee capacity payments in hard currency, regardless of whether electricity is generated or consumed. These "take-or-pay" contracts lock the government into paying billions each year even when demand falls short, a structural flaw that feeds directly into the circular debt cycle.

That cycle is staggering. By mid-2025, the government itself acknowledged stockpiles of circular debt in the range of Rs1.6–2.4 trillion. To keep the system afloat, it has had to negotiate a Rs1.275tr (about \$4.5bn) bank facility — essentially new borrowing to pay old obligations.

Small modular reactors offer flexibility — a unit can be deployed to power an industrial cluster, a remote mining operation, or even a desalination plant.

In effect, Pakistan is mortgaging its future to keep the lights on today. Meanwhile, the annual energy import bill remains in the \$15–18bn range, a constant drain on foreign reserves that leaves the economy exposed to global oil shocks.

Against this bleak backdrop, panels have spread across rooftops and farms, cutting diesel costs and reducing dependency on erratic grid supply. On the surface, this

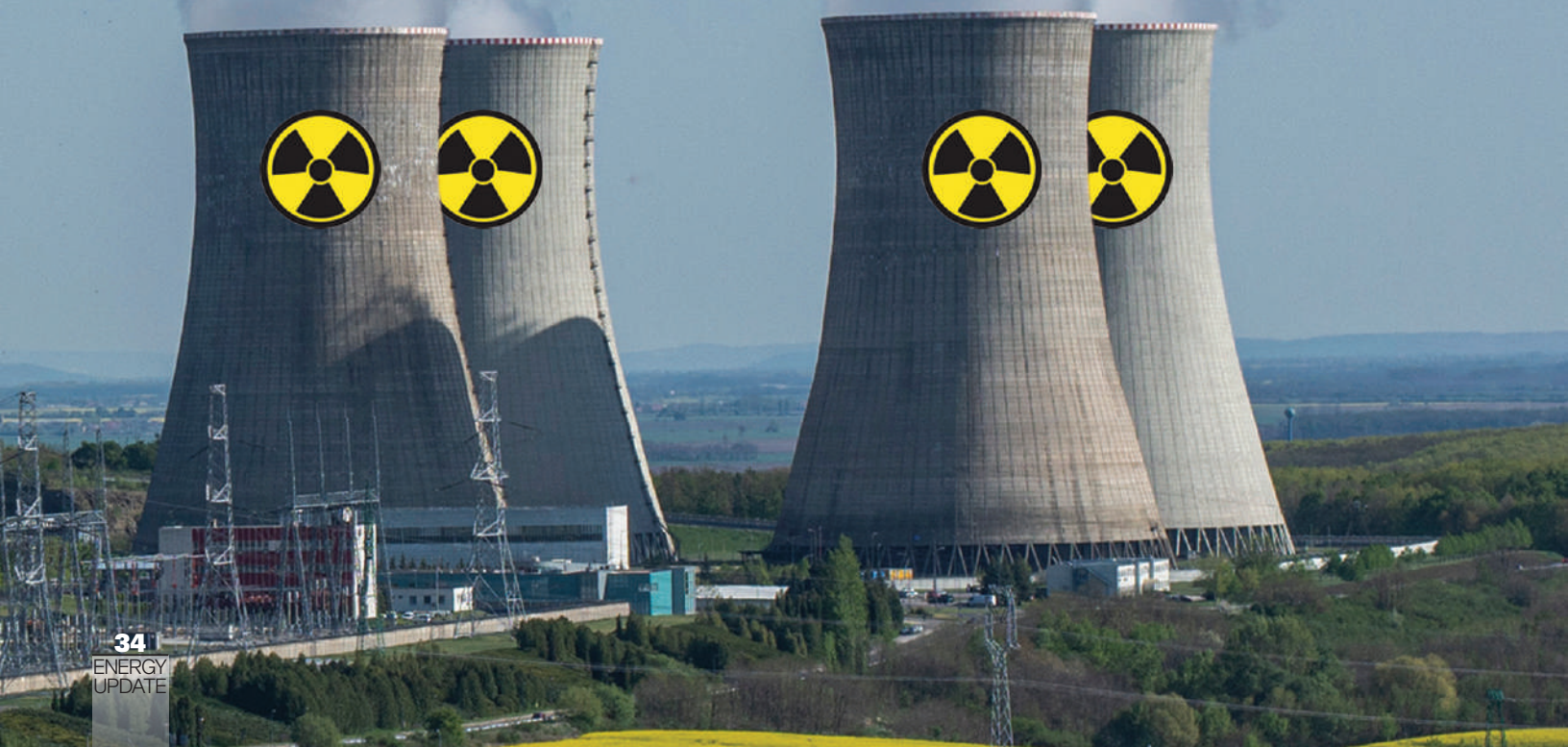
looks like a climate-friendly success. But the picture beneath is more complicated — and more dangerous.

A Reuters investigation earlier this year reported that some 650,000 solar-powered tube wells are now in operation, allowing farmers to pump groundwater at virtually no cost. The result has been an explosion of water-intensive crops like rice, with cultivation expanding by roughly 30 per cent between 2023 and 2025, even as groundwater levels in Punjab plunged to critical depths.

This is the solar paradox: free energy has removed the natural restraint that diesel once imposed. Instead of conserving scarce water, it has enabled farmers to pump around the clock, accelerating aquifer depletion and threatening Pakistan's long-term food security. The unintended consequence is that a "green" energy boom is undermining the very resource base on which agriculture depends.

However, SMRs are not an off-the-shelf solution — commercial rollouts are still at an early stage globally and financing will be complex with safety and oversight non-negotiable.

Pakistan, then, faces a trilemma: unaffordable energy, unsustainable debt, and



vanishing water. What is the way out?

It lies not in abandoning renewables, but in anchoring them with a technology that can provide clean, reliable, round-the-clock power without over-pumping aquifers or draining foreign exchange. That technology is nuclear power — but not in the old model of massive, decades-long megaprojects. Instead, Pakistan should look seriously at small modular reactors (SMRs) and portable microreactors.

SMRs are designed to be built in factories, shipped in modules, and installed faster and at lower upfront cost than traditional reactors. They offer flexibility: a unit can be deployed to power an industrial cluster, a remote mining operation, or even a desalination plant. Unlike solar, they are not hostage to the sun's cycles; unlike gas, they are not tethered to volatile global markets. Nuclear fuel costs are a relatively small share of operating expenses, making reactors far less sensitive to price swings than oil or LNG plants. Some SMR designs also use closed-loop or air-cooled systems, reducing the heavy water demands of conventional plants and making them compatible with arid regions.

For Pakistan, the advantages are compelling. An SMR programme would diversify the energy mix, reduce the dependence on imported fuels, and add dependable baseload power that could stabilise the grid.

It would also strengthen energy sovereignty by building on existing nuclear expertise: Pakistan already operates several large nuclear plants with the support of international partners and has a trained cadre of engineers and regulators. Extending that capability into microreactors is a logical next step.

The challenges are real. SMRs are not an off-the-shelf solution; commercial rollouts are still at an early stage globally, and financing will be complex. Safety, waste management, and international oversight must be non-negotiable. But none of these hurdles are insurmountable. ■

ECONOMY UNDER STRAIN

Turmoil and the Pakistan economy

The country needs to end the turmoil to protect its own best interests

Farhan Bokhari

The writer is an Islamabad-based journalist who writes on political and economic affairs. He can be reached at: farhanbokhari@gmail.com

As Pakistan faces increasing domestic unrest and a conflict on the Afghan border, the country's ability to revive a largely moribund economy must remain in question. This is increasingly the writing on the wall, amid growing internal discord between Pakistan's political rivals, a trend that has been escalating the country since the parliamentary elections in February 2023. Events such as this week's acrimony surrounding the change of the provincial chief minister of Khyber Pakhtunkhwa (KP) promise to deepen the divide further.

Meanwhile, the clashes between Pakistan and Afghanistan's Taliban regime along the Afghan border have unexpectedly triggered fresh questions over Pakistan's already challenged security. While official accounts suggest that the clashes were triggered by relentless Taliban attacks on Pakistan's border forces, the country must end the turmoil to protect its own best interests.

The coming winter, due to arrive soon, will make it harder for Afghanistan's ragtag forces to carry on the fight, in sharp contrast to Pakistan's well-equipped and battle-hardened forces. Yet, what is vital for Pakistan is to use all the means at its disposal to end the fight decisively rather than risk living with a recurring conflict.

And finally, fresh protests by the TLP this week, focused mainly across Punjab, presented another powerful reminder of the capacity of Pakistan's non-state actors to periodically disrupt life in key parts of the country. This was a timely reminder of the need for a comprehensive solution to the periodic agitation by non-state actors, determined to challenge the writ of the Pakistani state. The overall impact of internal politics and border conflicts together promises to undermine Pakistan's already fragile recovery. The economy has undoubtedly emerged from

a near-default situation just two years ago, when Pakistan was repeatedly cautioned as the next candidate to follow Sri Lanka, the last economy in South Asia to default on its foreign repayments. The return from that dangerous spot has helped Pakistan stand today in a relatively comfortable zone. However, edging away from being in a near default territory leaves behind a long road to progress that still needs to be achieved. In this journey, the most glaring challenge emanates from Pakistan being increasingly surrounded by a fast-growing and terrible fallout from climate change.

The country must end the turmoil to protect its own best interests. Across the country, the destruction this year appears to be without precedent in Pakistan's history. And the turmoil is set to grow, notably with the National Disaster Management Authority (NDMA) predicting heavier rainfall next year. The weather-related challenge is so intense that Pakistan must consider unprecedented steps, such as revising its entire spectrum of development goals, to mitigate the fallout from rapidly changing weather conditions. In this journey, widely publicised plans such as building new motorways or fanciful train projects must be shelved indefinitely. Instead, a robust recovery in Pakistan's resource and focus-starved agriculture sector is essential to meet harsh future challenges.

Second, the chronic challenges surrounding Pakistan's economy are vitally led by gaps in the country's revenue collections as well as a recurring failure to curtail wasteful public sector expenditure. Together, these two gaps have together undermined Pakistan's economic health over time. Fixing these challenges is central to reversing the downward slide of Pakistan's economy.

Ultimately, Pakistan's average citizens have lost faith in the government's ability to protect their interests. This loss of hope has flowed from a breakdown of institutions across the board, responsible for providing essential services such as healthcare, education and frameworks for the creation of employment opportunities. ■



Declares Record Rs 3.50 Dividend for First Quarter FY2025-26

EU Report

Oil & Gas Development Company Limited (OGDC) announced its financial results for the quarter ended September 30, 2025, declaring the highest-ever first interim cash dividend of Rs 3.50 per share (35%). The Company posted net sales revenue of Rs 96.19 billion and a profit after tax of Rs 38.30 billion, translating into EPS of Rs 8.91. Despite forced production curtailments and lower crude oil prices, OGDC achieved strong financial performance supported by improved gas prices

and rupee appreciation.

During the quarter, OGDC made two significant gas-condensate discoveries — Chakar-1 and Bitrism East-1 in Sindh — and added four new wells to production. The Company continued progress on key projects including Jhal Magsi, Dakhni, and KPD-TAY compression projects. OGDC also advanced its diversification initiatives in Reko Diq, Abu



Dhabi Offshore Block-5, and renewables, reaffirming its leadership in Pakistan's energy sector. ■

PPL Approves 25% Final Dividend at 74th AGM, Marks 75 Years of Excellence

EU Report

Pakistan Petroleum Limited (PPL) held its 74th Annual General Meeting, approving a final cash dividend of 25% on ordinary shares, bringing the total dividend for FY 2024-25 to 75%. Chairman Shahab Rizvi thanked shareholders for their trust and introduced the new MD & CEO, Mr. Sikandar Memon.

Mr. Memon highlighted PPL's strong operational performance, including two discoveries in the operated Shahbandar Block and six in partner-operated assets, with production from Pateji X-1 achieved in record time. PPL also signed a Production Concession Agreement with ADNOC for Offshore Block 5 in Abu Dhabi, strengthening its international footprint.

On diversification, progress was made in the Bolan Mining

Enterprises and Reko Diq projects. The company contributed Rs 4.6 billion toward CSR initiatives and will soon release its first ESG Report. PPL reaffirmed its strategic focus on sustainable growth, technological advancement, and energy security for Pakistan. ■



Balakot Hydropower Project Achieves River Diversion, Enters Main Construction Phase

EU Report

The 300 MW Balakot Hydropower Project in Khyber Pakhtunkhwa has reached a major milestone with the successful diversion and closure of the Kunhar River, marking the start of the project's main dam construction phase.

A joint venture between the Pakhtunkhwa Energy Development Organization (PEDO) and China Gezhouba Group Company Limited (CGGC), the project is the largest hydropower initiative currently being developed by the Khyber Pakhtunkhwa government. Funded by the Asian Development Bank (ADB) and the Asian Infrastructure Investment Bank (AIIB), the project is expected to be completed by 2030 at a cost of over US\$750 million.

Once operational, it will generate 1.144 billion kWh annually—enough to supply power to around 1.8 million people—and contribute an estimated Rs 20 billion in yearly revenue.

Speaking at a ceremony marking the river closure, CGGC Representative Mao Huigang termed the project a “symbol of Chi-



na-Pakistan friendship” under the Belt and Road Initiative, highlighting the creation of over 2,000 local jobs. PEDO CEO Habibullah Shah praised CGGC's contribution, reaffirming the strong partnership between Pakistan and China in the energy sector.

CGGC has previously executed major infrastructure projects in Pakistan, including Neelum-Jhelum, Mohmand, Karot, and Dasu hydropower stations, as well as key highway projects, reinforcing its role in the country's sustainable development. ■

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POTENTIAL TO PROGRESS - MINING SECTOR OF PAKISTAN

A prime example is the Reko Diq deposit in Balochistan with an estimated 54 billion pounds of copper and 41 million ounces of gold; Sindh's Thar coalfields contain more than 175 billion tons of lignite coal, representing a critical domestic energy source

Muhammad Usman Zafar

The writer is M.Phil. & M.Sc. Coal Technology with 14 years of Association with Mining Industry

Pakistan possesses significant natural resources with considerable untapped mineral potential. The country hosts a wide variety of minerals such as copper, gold, coal, salt, gypsum, limestone, marble, chromite, iron ore, barite, fluorite, granite, silica sand, dolomite, graphite, manganese, uranium, and rare earth elements. A prime example is the Reko Diq deposit in Balochistan, considered among the world's largest undeveloped copper-gold resources, with an estimated 54 billion pounds of copper and 41 million ounces of gold (Barrick Gold, 2023).

Sindh's Thar coalfields contain more than 175 billion tons of lignite coal, representing a critical domestic energy source (GSP). Additionally, Pakistan ranks among the top producers of Himalayan pink salt and has large-scale potential in rare earth elements, barite, and fluorspar. In spite of these resources, the mining sector accounts for only about 2–3% of Pakistan's GDP (Pakistan Bureau of Statistics), primarily due to underinvestment, outdated technology, and lack of policy continuity. With appropriate reforms and foreign investment, mining could become a cornerstone of Pakistan's economic future.

Although significant time has been spent on debates and policy formulation, the fundamental issues remain unresolved. Below are some key points which are somehow affecting the new investments and development of the mining sector.

- Limited exploration and project development capacity
- Lack of expertise in mineral processing and plant design
- Insufficient long-term investment in mining projects
- Short-term focus on quick profits over sustainable growth

Mining is inherently a long-term venture, with extended timelines before reaching initial production. Unlike many other industries, it takes significantly

PM Shehbaz Announces Resumption of Domestic Gas Connections



EU Report

Prime Minister Shehbaz Sharif on Sunday announced the reopening of new gas connections for domestic consumers, ending a nearly four-year ban. The decision marks a major policy shift aimed at addressing long-standing public demand for reliable household fuel supply.

Speaking at a ceremony marking the resumption of regasified liquefied natural gas (RLNG) connections in Islamabad, the Prime Minister said the move reflects the government's commitment to providing citizens with affordable and quality energy.

"In 2022, there was immense public pressure for new gas connections, but the government faced multiple challenges," the premier said. "With this landmark decision, the public will now have access to affordable and reliable fuel," he added.

The announcement follows the federal cabinet's September decision to lift the ban on new domestic gas connections and resume RLNG supply across the country.

In a video message played during the event, Minister for Petroleum Ali Pervaiz Malik reaffirmed the government's resolve to enhance public convenience through efficient energy delivery. He noted that the Sui Northern Gas Pipelines Limited (SNGPL) had successfully reduced its line losses to 4.93 percent while posting a profit of Rs29 billion in the previous fiscal year.

Officials said that the supply of RLNG will now be extended nationwide to facilitate thousands of new applicants awaiting domestic gas connections.

longer to generate profits. The mining asset life cycle extends over several decades and is divided into distinct stages, each with its own timelines, costs, risks, and deliverables (KPMG International, 2012). Expansion and exploration can take 1–10 years, involving geological surveys, prospecting rights, and resource identification. The evaluation stage, lasting 3–6 years, includes preliminary economic assessments, feasibility studies, and permitting. Development typically takes 1–3 years, focusing on infrastructure, plant construction, and preparation for operations. Production, the longest phase at 10–50 years, involves commercial extraction, mine expansion, and revenue generation. Finally, closure spans 1–10 years, during which decommissioning, mine shutdown, and environmental rehabilitation are carried out to ensure sustainability.

Each stage brings unique challenges influenced by geography, geology, infrastructure, and political conditions. Early stages are particularly risky, as critical questions must be addressed: Is the resource economically viable? What are the market conditions and commodity prices? Which mining and processing methods are technically efficient and cost-effective? How will environmental standards be met, and how accessible is the site to transport infrastructure such as ports? Prospecting, the first operational step, carries high risk and low cost, while advanced exploration, including drilling and resource definition, can require investments of \$1 million to over \$15 million. A key objective is to achieve internationally recognized resource estimation reporting standards such as JORC 2012 or NI 43-101 to validate project viability.

Once viability is established, development demands

significant capital ranging from \$10 million to more than \$100 million for mine construction and supporting infrastructure (S&P Global, 2022). Due to these costs, projects often change ownership at this stage. Extraction then converts capital expenditure into operating expenditure, generating revenue provided planning has been sound and commodity prices remain favorable. Mines typically continue exploration during production to expand resources and extend mine life, ensuring profitability across several years. Finally, closure occurs when recoverable resources are depleted, with the focus shifting to responsible decommissioning, environmental compliance, and site rehabilitation. Mining projects take considerable time to reach maturity, demanding long-term commitment and patience from investors.

After understanding the life cycle of mega mining projects, we as a nation need to build in-house capabilities. Focus on developing indigenous resources by engaging academia, develop trained manpower to support this emerging industry. Allocate budgets on R&D in mineral processing, geology and mining sectors. Sponsor funded PhD programs, hire competent local personnel to be the future leader of this growing industry.

Conclusion and Way forward:

It is proven now that Pakistan's mining sector holds immense potential, with world-class copper, gold, coal, and industrial mineral deposits. With targeted reforms, adoption of international best practices, and strong collaboration between government, academia and private investors, mining could evolve into a key driver of sustainable economic growth. ■

Climate planning is needed in Pakistan

Taimur Khan

The writer is a development consultant

Pakistan has suffered three major floods in just fifteen years. In 2010, the Indus overflowed and left a fifth of the country underwater. In 2022, large parts of the country drowned again, displacing millions and causing billions in damage. And now, in 2025, we find ourselves back in the same place.

According to NDMA estimates, this year's floods alone damaged or destroyed nearly 2,000 kms of roads and about 240 bridges. Agriculture lost over Rs300 billion, while damage to transport and

in our hands is adaptation and resilience: building infrastructure that can withstand a changing climate.

I have spent the past few years working with government departments on these issues. What I have realised is that our problem is not the lack of engi-

bidder. On paper, it saves money. In practice, it often means cutting corners. Weak oversight and limited testing allow poor materials and designs to pass. The result is short-lived infrastructure that fails when it is needed most. The real cost is paid when floods wash away what was cheaply built, and we end up spending many times more to rebuild it.

This is not how the rest of the world is moving. Countries affected by similar disasters have reformed procurement to reward durability and risk-sharing, rather than just the lowest upfront cost. Pakistan must also adopt procurement models that mandate shared responsibility and



communication networks is estimated at almost Rs100 billion.

The pattern is painfully familiar. We suffer, raise funds, rebuild and then watch the same roads, bridges and schools collapse in the next flood. Pakistan is among the world's most climate-vulnerable countries. We contribute less than one per cent to global greenhouse gases, so mitigation is not in our hands. What is

neers or technical talent. The real problem lies in how we plan, design and build public infrastructure. Our systems, our rules, and our working culture are still built for an old climate that no longer exists.

Let's start with procurement. Even today, most projects still go to the lowest

risk. Global practices offer clear models for this shift. Germany is increasingly using collaborative contract models that provide for transparent, cooperative risk allocation for complex public infrastructure projects, shifting away from adversarial fixed-price tenders where the private sector may overprice risks.

Meanwhile, Australia's 'alliance

contracting' model is highly effective because it binds all participants to a culture of shared fate, formally spreading risks and rewards between the client and contractors. This unique structure eliminates disputes, encourages innovation and drives better long-term project performance. Finally, in the UK, a firm requirement is now in place for suppliers bidding on large government contracts (over GBP5 million) to publish a Carbon Reduction Plan showing their path to net zero, thereby ensuring carbon accounting and climate considerations are mandatory before project approval.

We must also acknowledge that the climate is changing, so globally, the best practice is shifting to adaptive planning, designing projects that dynamically evolve as conditions change. The Thames Estuary 2100 Plan in the UK and the Dutch Delta Programme both use the 'adaptive pathways' methodology: instead of locking in one fixed design, they define triggers and rigorous monitoring systems to update plans every few years. These programmes protect millions of people and billions in infrastructure by recognising that true resilience is a continuous process, not a product.

Pakistan's planning cycle also needs a similar shift. Our PC-I and PC-II forms do ask about climate risks, and large projects now conduct environmental and hydrological assessments. Yet what is missing are institutional checks that ensure those findings shape design, procurement and operation. And our monitoring forms (PC-III) track spending and timelines, not how an asset performs under stress.

The situation is made worse by limited and expensive data. Our network of weather and river monitoring stations is thin and often not working. Even when data exists, our departments, such as the Meteorological Department and Wapda, sell it. Critical data on historic daily temperature, rainfall and river flow must be bought through lengthy bank challans that can take weeks or months and cost more than a million rupees. This is absurd. Climate data is not a luxury; it is the foundation of climate planning. Countries like Bangladesh, Kenya, Vietnam and others have made their hydromet data public, enabling their engineers and researchers to design more resilient infrastructure. Pakistan must do the same.

Countries are experimenting with performance-based and cost-sharing contracts, which require contractors to maintain assets for several years after completion and link payments to actual performance under stress. Such models could also be piloted here, especially for flood-prone roads and bridges.

Pakistan could also learn from risk-transfer mechanisms like the Caribbean Catastrophe Risk Insurance Facility or Mexico's catastrophe bonds, which provide rapid post-disaster funds to rebuild damaged assets. ■

CLEAN ENERGY

Pakistan's solar landscape Solar is expected to account for a fifth of generated electricity by 2026

Imaduddin Ahmed

The writer is author of *The Political Economy of Hydropower* and *Dependant Nations* published by Springer Nature

Pakistan's rooftop solar boom is the canary in the mine for the rest of the world. The dawn of ultra-cheap renewables has arrived.

Despite accounting for less than one per cent of grid capacity in 2023, solar is expected to account for a fifth of generated electricity by 2026. This radical shift is a signal to the rest of the world that pouring scarce public money into baseload fossil generation is no longer just environmentally reckless, but also fiscally dangerous and politically destabilising. What began as a middle-class hedge against blackouts, intolerable heat and soaring electricity bills has become a 'run on the grid' that is deepening the electricity grid's circular-debt spiral.

A year ago, the IEEFA forecast that Pakistan's net-metering rules created two-to-four-year paybacks for 5-25kW home systems. Then, adoption exploded. The scale of solar arriving at Pakistan's borders has been unprecedented, importing 17GW of solar panels in 2024, more than all of Africa combined. This has benefited adopting householders' wallets, and should have dramatically reduced pollutants and greenhouse gas emissions.

But there is a dark side to the rapid solar adoption. Grid defection creates a 'sovereign doom loop': as more consumers exit, fixed guaranteed payments get spread over fewer units sold. This creates a vicious cycle, encouraging further defection, and/or further increases the energy sector's circular debt — a recurring cycle of unpaid financial obligations across the

energy supply chain.

Coupled with IMF-imposed loan conditions to remove energy subsidies and currency depreciation, nominal prices have more than doubled over three years, meaning that it makes economic sense for a broader base of consumers to defect from the grid.

To stymie the run on the grid, the government has slashed the purchase price for buying back rooftop solar electricity, and is considering a shift from net metering to net billing. To manage its debt, the government is negotiating a \$4.5 billion loan with commercial banks, and has informed the IMF that it will not pay around \$780 million to Chinese independent power plants as interest on delayed payments for purchased electricity, and will instead seek a waiver from Beijing.

To effectively stymie grid defection, given the regressive distributional effects of ever-increasing tariffs on the lower-income non-solar rooftop majority, Pakistan's policymakers must consider ceasing de facto subsidies to rooftop solar with net-metering, and allowing distribution companies to recover fixed costs via ongoing surcharges on open-access and rooftop users.

The government can then present these three sets of interventions — reduced capacity charges to IPPs, cessation of net-metering and surcharges — to the IMF, to abandon rigid opposition to transitional tariff subsidies. Repeating its mantra into May 2025 of "ensur[ing] energy sector cost recovery" shows a lack of understanding of the new world in which market-driven forces are causing fossil fuel assets to be stranded by renewables. Subsidies will absolutely be necessary for lower-income householders incapable of buying solar rooftop and which are made to feel the brunt of ever-escalating grid electricity prices. ■

DIPLOMATIC ENCLAVE



Sindh Chief Minister Syed Murad Ali Shah meets with Mr. Mudzakir, the New Consul General of Indonesia, who called on him at CM House.



Sindh Chief Minister Syed Murad Ali Shah, along with provincial ministers, diplomats, and MoFA officers, cuts the cake to celebrate the opening of the Diplomatic Bazaar "Global Palate – Pakistani Soul: Taste Without Borders" organized by the Ministry of Foreign Affairs (MoFA) Liaison Office, Karachi, at the State Guest House.



Sindh Chief Minister Syed Murad Ali Shah presents a bouquet to Mr. Ergul Kadak, Consul General to Türkiye, during a reception held to celebrate the 102nd Anniversary of the Proclamation of the Republic of Türkiye at a local hotel. Governor Sindh Mohammad Kamran Tessori was also present on the occasion.



Sindh Chief Minister Syed Murad Ali Shah samples cuisines during his visit to the food stalls set up by diplomats at the Diplomatic Bazaar "Global Palate – Pakistani Soul: Taste Without Borders" organized by the Ministry of Foreign Affairs (MoFA) Liaison Office, Karachi at the State Guest House



A Round Table Conference marking the 30th Anniversary of Turkmenistan's Permanent Neutrality was held at the National Language Promotion Department (NLPD), organized by The Gulf Observer, The Gulf Observer Research Forum, and the Embassy of Turkmenistan in Pakistan. Ambassador H.E. Atadjan Movlamov highlighted Turkmenistan's policy of neutrality as a unique model promoting peace, trust, and cooperation. He underscored Turkmenistan's global initiatives, including UN resolutions on peace and sustainable development, and praised Turkmenistan-Pakistan partnership through projects like TAPI and TAP, describing them as "pipelines of peace." The envoy reaffirmed Turkmenistan's commitment to dialogue, mutual respect, and expanding regional connectivity under the Year of Peace and Trust 2025.



Sindh Chief Minister Syed Murad Ali Shah meets with Ms. Rita Dhital, the Ambassador of Nepal in Pakistan at CM House

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Power surplus or structural deficit?

Pakistan is now producing more electricity than it consumes; many regions still continue to face scheduled and unscheduled power outages; a frustrating contradiction reflects the state of Pakistan's transmission and distribution infrastructure

Asad Mahmood

The writer has served at the Energy Conservation Fund, NEECA

Pakistan is now producing more electricity than it consumes. As of March 2025, the country's installed power generation capacity stands at 46,605MW, a figure that far exceeds actual consumption needs.

During the first nine months of FY2025, national generation reached 90,145GWh, while consumption lagged at 80,111GWh, creating a surplus of nearly 10,000GWh. Yet, despite this surplus, many regions continue to face scheduled and unscheduled power outages -- a frustrating contradiction that reflects the state of Pakistan's transmission and distribution infrastructure.

The seasonal mismatch between supply and demand is even more revealing. While summer demand peaks at around 32,000MW, winter consumption drops to 12,000–13,000MW, leaving a glut of unutilised power ranging from 7,000MW to 14,000MW, depending on the time of year. Instead of serving consumers, this excess capacity results in capacity payments -- fixed charges paid to power producers regardless of usage. These payments now burden consumers with electricity costs exceeding Rs15 per unit, even for electricity they do not receive.

In response, the government has taken an unconventional approach by earmarking 2,000MW of surplus power for cryptocurrency mining and artificial intelligence (AI) data centres, in an effort to monetise unused capacity. Such innovative measures offer only a temporary solution; the real challenge -- and opportunity -- lies in modernising the national grid. The objective should be to reduce transmission and distribution losses, improve equity in supply and create a flexible infrastructure that can efficiently integrate renewable energy in the years ahead.

With surplus generation already available, the wiser course of action is to focus on resilience, reform

and reinvestment -- stabilising what exists before building what is not yet necessary.

Pakistan's distribution companies (DISCOs) can transform surplus capacity into actual service delivery. Rather than acting as passive transmitters of electricity, DISCOs must evolve into active agents of efficiency and accountability. This includes investing in grid automation, reducing transmission and distribution losses -- which hover around 17-18 per cent nationally -- and improving bill recovery through smart metering and targeted customer engagement. By upgrading their technical infrastructure and reforming governance practices, DISCOs can ensure that electricity reaches end-users reliably and affordably.

Decentralised planning and performance-based management can enable DISCOs to align their operations with local demand profiles and renewable integration targets. If empowered and held accountable, DISCOs could shift from being a bottleneck to becoming a bridge between surplus generation and sustainable consumption -- a critical link in Pakistan's pursuit of energy resilience.

Power sector reforms and infrastructure upgrades are needed to reduce the cost of doing business and attract long-term investment, particularly in energy-intensive sectors that depend on consistency and affordability

Power sector reforms and infrastructure upgrades are needed to reduce the cost of doing business and attract long-term investment, particularly in energy-intensive sectors that depend on consistency and affordability

While solar energy is important for Pakistan's long-term sustainability, a temporary pause or recalibration in its rapid expansion may be necessary to ensure the energy transition is both effective and economically viable. In recent years, Pakistan has witnessed a notable increase in solar adoption, particularly through utility-scale projects and rooftop solar installations by households and businesses seeking relief from

rising energy costs. Rooftop solar, in particular, empowers consumers to generate their electricity and reduce dependence on the national grid, but it also introduces new technical and financial challenges for power utilities.

Adding more solar to the grid without addressing structural inefficiencies could worsen this financial strain. Pakistan's existing transmission and distribution infrastructure is not equipped to handle the variability and decentralised nature of solar power, particularly in the absence of energy storage and smart grid systems.

DISCOs are also struggling with revenue losses and lack the readiness to integrate large-scale rooftop solar through net metering. Until grid stability, pricing reforms and institutional capacity catch up, an unrestrained push for solar could create more challenges than solutions. Therefore, the shift to solar should proceed with caution, guided by system reforms and infrastructure upgrades to ensure it delivers long-term, equitable benefits.

Ultimately, it is structural reform that holds the key to a stable and sustainable energy future for Pakistan. By modernising the grid, empowering DISCOs, reducing inefficiencies and designing fair and forward-looking tariff structures, Pakistan can transform its surplus into a strategic asset. System upgrades such as smart grids, energy storage and real-time demand management will not only improve reliability but also create the flexibility required to integrate renewable energy sources in the future safely.

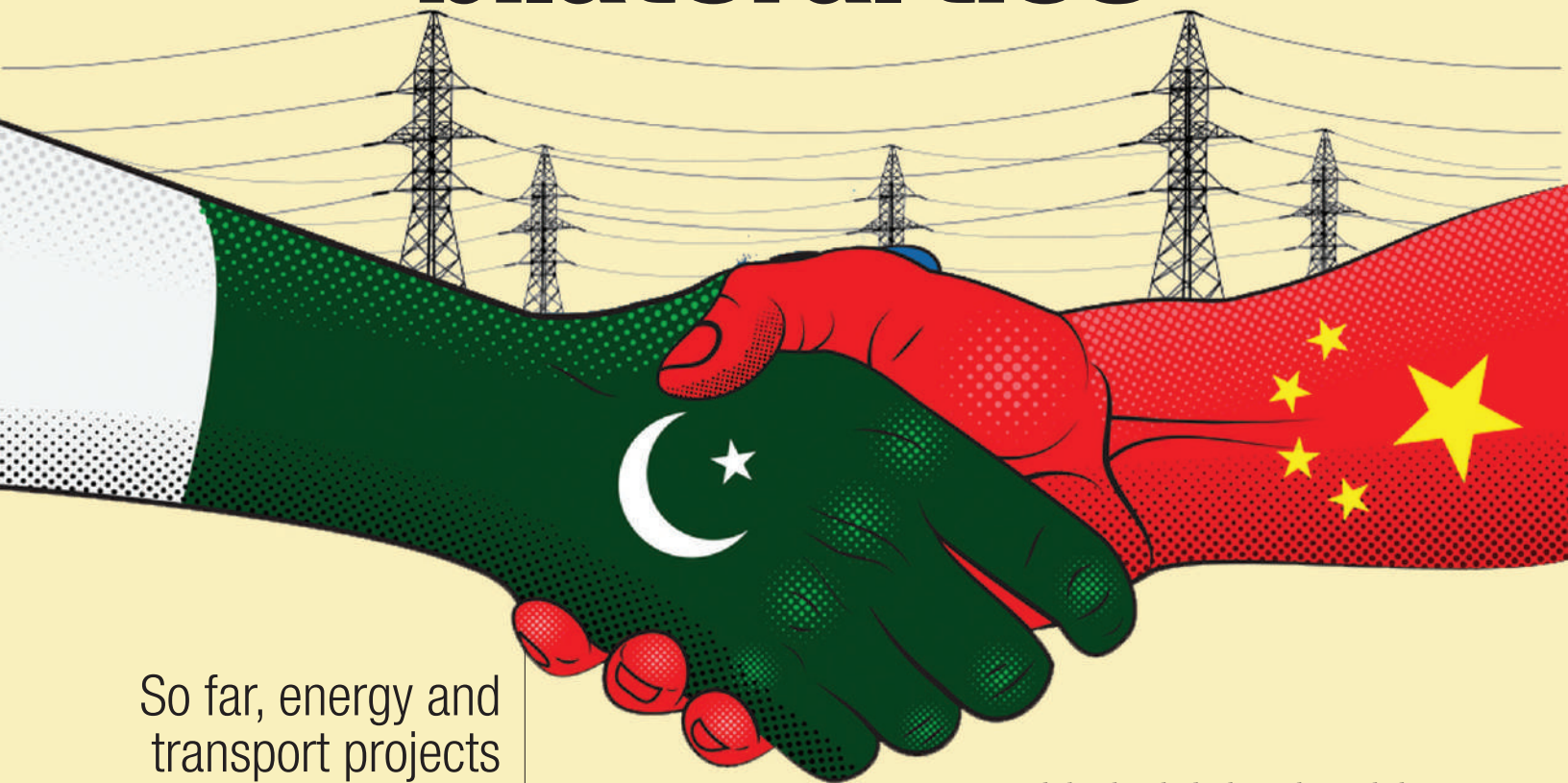
To turn surplus generation into a true national advan-

tage, Pakistan must rethink its power sector not as a production problem but as a delivery and governance challenge. Investing in smarter infrastructure, empowering DISCOs through decentralised reform and phasing in renewable energy with grid readiness in mind can pave the way for a more resilient and inclusive energy system. Without these foundational changes, the paradox of power abundance and power outages will persist -- eroding public trust and stalling economic progress. The path ahead demands not more megawatts, but smarter megawatts that are delivered efficiently, equitably and sustainably.

Power sector reforms and infrastructure upgrades are needed to reduce the cost of doing business and attract long-term investment, particularly in energy-intensive sectors that depend on consistency and affordability. A reformed and responsive power infrastructure will not just stabilise the present; it will energise the economy for decades to come, making Pakistan more resilient, competitive and climate-ready in a rapidly evolving global landscape. ■



Redefining China-Pakistan bilateral ties



So far, energy and transport projects worth \$25.2 billion completed; new five-year plan prioritises fast-tracked industrialisation in Pakistan; stronger military cooperation and enhanced counter-terrorism coordination pledged

Nasir Jamal

The five-year action plan (2025–2029) agreed between China and Pakistan aims to broaden their “all-weather partnership” beyond economic corridors, extending it into politics, defence and security, counterterrorism, climate change, science & technology, and culture.

The blueprint seeking to build “an even closer China-Pakistan community with a shared future in the new era” comes against the backdrop of a shifting regional and global security and economic landscape, with Beijing — in the words of a Chinese foreign ministry official — “envisioning an even greater role for Islamabad in international and regional affairs”.

China has pledged its support to

help Islamabad achieve that goal, the official stated recently speaking to a delegation of Pakistani journalists visiting Beijing. The new roadmap draws mainly on earlier milestones, including the launch of the China Pakistan Economic Corridor (CPEC) initiative in 2015, and subsequent documents and pledges like the long-term CPEC plan and the Framework Agreement on Industrial Cooperation.

In spite of a lot of optimism around the new China-Pakistan roadmap, many remain cautious as ‘an element of uncertainty still hangs’ over CPEC cooperation. It looks to expanding security ties, including stronger military cooperation and enhanced counter-terrorism coordination. Both sides described their strategic defence partnership as “irreplaceable” for regional stability, reiterating “zero tolerance” on terrorism. More importantly, while security ties remain central, both sides are consolidating economic

cooperation.

The plan in question reaffirms CPEC as the “flagship” of their economic partnership and a pioneering project of the Belt and Road Initiative (BRI), aligning its five corridors — growth, livelihoods, innovation, green and openness — with the growth goals of Islamabad’s Uraan initiative, with a focus on tighter security for Chinese nationals and projects in Pakistan amid targeted terrorist attacks against Chinese interests.

The roadmap for bilateral cooperation under what Pakistani officials often refer to as CPEC 2.0 follows Pakistan’s efforts to secure Beijing’s renewed support for its industrialisation through investment in the country’s manufacturing sector to accelerate export-led growth.

So far, energy and transport projects worth \$25.2 billion have been completed under the first phase of CPEC, while schemes amounting to \$26.8bn are in the pipeline.

The new five-year plan prioritises fast-tracked industrialisation in Pakistan through special economic zones, strengthening of mining and agricultural cooperation, and expansion of “small and beautiful” livelihood projects in health, education, agriculture and disaster prevention.

Planning Minister Ahsan Iqbal recently told a media briefing that Pakistan and China had agreed to form a consortium of bilateral and multi-lateral partners, including the Asian Development Bank and the Asian Infrastructure Investment Bank, to finance the \$7bn Karachi-Peshawar railway line.

Trade and connectivity will be bolstered through expanded use of the Khunjerab Pass for both bilateral and Afghan transit trade, while pushing forward trade liberalisation under Phase-II of their Free Trade Agreement. Besides, Beijing will encourage Chinese enterprises to invest in Pakistan while committing to providing “financial support (to Islamabad) within its capacity”.

In an interview with Associate Press of Pakistan, Professor Cheng Xizhong, a senior research fellow at Beijing’s Charhar Institute noted that the plan carries extraordinary economic significance as it will strengthen bilateral trade, investment and industrial cooperation.

With CPEC already delivering

substantial outcomes, he maintained, the next phase will see greater investment, helping Pakistan boost its development capacity through industrial up-gradation and enhanced position in the global industrial chain.

In spite of a lot of optimism around the new roadmap redefining bilateral ties, many remain cautious. Speaking with Dawn, economist Adil Nakhuda noted that despite the optimism surrounding the action plan, “an element of uncertainty still hangs” over CPEC cooperation. “Security remains the foremost challenge while Pakistan’s fragile economic conditions are discouraging for Chinese investors.”

He points out that the first phase of CPEC, largely focused on energy and transport infrastructure, successfully addressed critical connectivity and growth bottlenecks. “The second phase, however, is supposed to drive industrialisation, FDI inflows and export growth. If exports don’t grow, the second phase will not be any different from the first one,” he cautioned.

For Pakistan to attract meaningful foreign investment, Mr Nakhuda said, it must first tackle security concerns, complete Special Economic Zones and carry out governance reforms. “You have to do this for foreign investors; don’t expect them to bring their capital here and also clean up your policy and governance mess for you,” he underlined, pointing to the need for ease of doing business, tariff rationalisation, factory law reforms, and a broader enabling policy framework. “We need a total policy overhaul for the success of CPEC 2.0.”

Others like Dr Safdar Ali Sohail, Executive Director at the Social Protection Resource Centre and a former civil servant, argued that “CPEC is now just one of several pillars of bilateral China-Pakistan cooperation, with military, security, political and diplomatic ties appearing to take precedence.”

Dr Sohail pointed out that linking economic cooperation with Pakistan’s Uraan programme reflects Chinese sensitivity to Islamabad’s growth priorities. For it to succeed, the plan must be backed in the next six months by targeted and definitive policies, strategies and funding commitments. ■

Courtesy: Daily Dawn

ENERGY NEWS

Climate change, population growth hindering Pakistan from becoming \$3tr economy: Aurangzeb



EU Report

Finance Minister Muhammad Aurangzeb has said that unchecked population growth and climate change are hindering Pakistan from becoming a \$3 trillion economy.

Pakistan is home to a vast population of over 251 million, according to World Bank figures. In 2023, the population growth rate was reported to have reached around 2.55 per cent. However, almost 45pc of Pakistan’s population lives below the poverty line, according to a World Bank report.

At the same time, Pakistan has been ranked as the most vulnerable country to climate change in 2022, according to the Global Climate Risk Index 2025.

“I have been clear right from the beginning that we have two existential issues because if we don’t tackle them correctly ... there are two reasons that could derail us from becoming a \$3tr economy and those are climate change and population growth,” said the finance minister in an interview on Geo News show ‘Capital Talk’.

Aurangzeb said the former was no longer merely “an academic discussion” but something “we are living day in and day out”, pointing to the onset of the smog season in Lahore and the recent flood which devastated large tracts of Pakistan. The finance czar said the frequency and intensity of extreme climate events were increasing, adding that he had participated in three forums during the last week that discussed the matter of climate change. ■

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Withering geoeconomics and Pakistan's future

All signs are now pointing in the direction of yet another incoming geopolitical rent

Khurram Husain

The writer is a business and economy journalist

It was almost exactly three years ago that a paper was published by Moeed Yusuf and his co-author Rabia Akhtar arguing in favour of a pivot away from geopolitics towards geoeconomics as Pakistan's primary external orientation. That paper had built upon the National Security Policy (NSP) of 2021 which had expanded the meaning of the word 'security' to include human

saying but at the same time, things seem to have moved in the opposite direction to the one they urged policymakers to take.

The paper argued that a sound economic footing built on domestic reform is the key to securing Pakistan's future. It argued that for a pivot to geoeconomics that was "a significant departure in how Pakistan perceives its own utility for the world". They observed that Pakistan had traditionally seen itself as a "net security provider to the West, a strategic neighbour for China, and a partner to key Middle Eastern countries like Saudi Arabia as a means of soliciting foreign economic support". But this model was "structurally flawed", they argued. And rightly so.

Sadly the advice seems to have generated little more than chatter and ample nodding of heads, with little to no impact on policy. Some of this is due to the powerful hold that geopolitics has on the minds of the establishment, and in equal measure, it is owed to the fact that the world evolved in ways different from what the authors foresaw.

All signs are now pointing in the direction of yet another incoming geopolitical rent.

The authors were right in seeing neoliberalism coming under increasing strain and countries around the world retreating into "economic nationalism". They were right when they said this tendency would drive a greater role for 'geoeconomics' in the future, as more and more countries subordinated their

economic policy to the requirements of a changing global order. They were right in pointing out that Pakistan would be at a disadvantage in this world due to its economic weakness, and must deploy a form of geoeconomics that is a "win-win" for its partners rather than a zero-sum game.

But this was the easy part. They were writing after the tariff wars of the first Trump presidency after all, and the dying throes of the

dignity and prosperity as well. Lasting security, the NSP had argued, cannot be built with guns alone, but must also secure people's rights to live in dignity and pursue their own prosperity.

Recent developments provide a good opportunity to revisit the arguments made in that paper. Subsequent developments have vindicated substantial portions of what the writers were



liberal world order were all around us. Much of the hysteria around China's Belt and Road Initiative had peaked, but was still around, and it was possible to see how the world was going to be carved up into competing economic blocs. The conventional wisdom at that time (to which I also subscribed in those days) was that a day was coming when Pakistan would be forced to choose between America and China, that the days of foreign bailouts were ending, Pakistan's addiction to geopolitical rents would have to be broken.

In pointing the way forward, the authors laid the emphasis on "connectivity", particularly in energy, as well as "development partnerships" that sought investments rather than aid. And here things began to fall apart.

Second, the connectivity rested on good relations with Afghanistan, normalisation of ties with India, and a lifting of Iran's sanctions. Each of these now seems like a remote possibility, so even if there was to be a cross-border demand for energy transmission — whether via the Iran gas pipeline or the CASA electricity transmission line — the regional situation seems to be closing these possibilities off more than opening them up.

Development partnerships resting on investments have taken a mortal hit from the most recent episode of near bankruptcy that Pakistan is still trying to emerge from. The message from the past few years that has gone to all foreign investors around the world is that Pakistan is not able to afford any investment because the economy here tends to run out of foreign exchange. The only condition under which investors might come into Pakistan now would be if they were riding the coat-tails of geopolitics.

Most importantly, all signs are now pointing in the direction of yet another incoming geopolitical rent. The specifics are unknown, but Pakistan's rulers seem to be busy securing for themselves one more round of security-related inflows of exactly the sort that the authors of that paper said Pakistan needs to depart from.

Today all three — the US, China and Saudi Arabia — are smiling on Pakistan. Yet one more round of geopolitical rents seems to be gathering on the horizon (though it is still not clinched). And old ways of thinking consider themselves vindicated while those of us who have always argued for the merits of learning to stand on our own feet, must perhaps wait another decade for our moment. ■

ENERGY SECTOR

Top 250 oil and gas firms own just 1.5% of the world's renewable power

Chris Stokel-Walker

Leading oil and gas companies own less than 1.5 per cent of the world's renewable power capacity — raising questions about how committed they are to the green energy transition, despite their public claims.

Marcel Llaveró Pasquina and Antonio Bontempi at the Autonomous University of Barcelona looked at ownership records of more than 53,000 wind, solar, hydroelectric and geothermal projects worldwide, as tracked by Global Energy Monitor, a non-governmental organisation. They then cross-checked these to see what proportion of them were owned by the world's 250 biggest oil and gas companies, which are collectively responsible for 88 per cent of global hydrocarbon output.

Many fossil fuel firms have pledged to invest in renewable energy sources as the world attempts to transition away from oil and gas, but the researchers found that the top firms own just 1.42 per cent of the total operating renewable capacity globally. More than half of that — some 54 per cent — was owned via acquisitions, rather than companies developing their own projects. By calculating the total energy output of the 250 firms, the pair found that renewable power accounts for just 0.13 per cent of the energy produced by these companies.

"The results were surprising, even for me," says Llaveró Pasquina. "I knew they were playing a very little role in the energy transition. I knew it was only for show. It was only for dressing their narrative. But I didn't expect this low number."

Llaveró Pasquina and Bontempi are both part of a group called Environmental Justice, which aims to produce research to "study and contribute to the global environmental justice movement". Llaveró Pasquina says his campaigning position strengthens his research. "You have the biggest interest in being as rigorous as

possible, because you have to convince and you have to show what's true."

The fact that big energy firms, which have made their name and fortunes through oil and gas exploitation, aren't massive players in renewables is unsurprising, says Thierry Bros at Sciences Po in Paris. "At the end of the day, [the energy transition] has to be something disruptive, and it's not going to be in the hands of those companies."

However, Bros does believe the big energy firms are unduly promoting their work on the energy transition. "They are portraying themselves [as] doing something, but I think if they were to do something, it would be more the carbon capture and sequestration," he says, which involves capturing carbon as it is emitted, for instance when burning fossil fuels. "They are not doing much because I think it's completely outside their domain of expertise."

Offshore Energies UK, an industry body that represents the UK's offshore energy industry, including oil, gas, wind, carbon capture and hydrogen, declined to comment directly on the study's findings. However, it pointed to a previous statement from its chief executive, David Whitehouse. "Far from being in conflict, oil and gas, wind, and emerging low-carbon technologies are part of one integrated system. It is the skills of our people, the same people who built the North Sea that will deliver this transition," he said. ■



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WHEN SEWAGE MEETS THE SEA

Karachi, Pakistan's largest city, is drowning in its own waste

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Karachi, Pakistan's largest city, is drowning in its own waste. The city's sewerage system has collapsed – and the Karachi Water and Sewerage Board (KW&SB) bears much of the blame.

A thematic audit by the auditor general of Pakistan (AGP) lays bare the extent of this institutional breakdown. The findings, part of the AGP's report on Sindh for 2023–24, reveal a city struggling under decades of neglect, weak management and a complete disregard for environmental laws.

The KWSB was created under the Karachi Water & Sewerage Board Act, 1996, to build, maintain and operate water and sewerage systems. Its mandate includes collecting, pumping, treating and disposing of domestic and industrial waste. However, the audit reveals how far reality has deviated from the law. Karachi's sewerage infrastructure is in a state of decay. Trunk mains are inadequate, pumping stations malfunction and treatment capacity is almost nonexistent.

The AGP found that over six million people in Karachi have no access to public sewerage service. Network coverage is barely 60 per cent. Maintenance is rare. The system, the report notes, has received “very little maintenance since 1960”.

Karachi's three sewage treatment plants – STP-I (Site), STP-II (Mehmoodabad) and STP-III (Mauripur) – were designed to handle 150 million gallons of wastewater per day. None of them works. The audit observed that all three have been non-functional for years.

Meanwhile, Karachi produces roughly 455 million gallons of sewage each day, most of it flowing untreated into the sea. Even if all three plants were fully operational, the treatment gap would still exceed 300 million gallons per day. Because the plants remain shut, an estimated 455 million gallons of raw sewage is dumped directly into the Arabian Sea.

To picture that volume, imagine filling about 689 Olympic-sized swimming pools with toxic sludge and emptying them into the Arabian Sea every single day.

Marine scientists have been warning about this collapse for years. The Arabian Sea near Karachi now receives one of the largest volumes of untreated municipal waste of any megacity in South Asia.

The ecological damage is visible. Algal blooms thrive on nitrogen and phosphorus from sewage. When these blooms die, they deplete oxygen and create ‘dead zones’ where marine life cannot survive.

Industrial waste from the Sindh Industrial Trading Estate (SITE) and from factories in Korangi's Industrial Area add another layer of danger. Heavy metals like mercury, cadmium, and lead sink into seabed sediments and accumulate in

fish. Studies have shown that these toxins already exist in seafood sold in Karachi markets. The health risks are real for both marine species and humans.

Karachi's mangrove forests, once natural shields against storms and saltwater intrusion, are dying under sewage. Mangroves also serve as nurseries for fish and habitats for migratory birds. Their loss deepens environmental and economic damage. Without mangroves, saltwater creeps inland, contaminating soil and groundwater. Farmland has turned barren, and migratory bird populations along the Indus delta have sharply declined.

The audit's findings match what coastal communities have experienced for years. Fishing villages like Ibrahim Hyderi, Rehri Goth and Keamari depend on nearshore catches. Those catches are shrinking. Fishermen now travel farther and spend more to bring home less. Some report their daily hauls have fallen by half in the past decade.

Fish caught near polluted waters often smell foul and fetch lower prices in markets. Contaminated fish also threaten public health. Alongside sewage, plastic waste adds to the problem. Microplastics enter the food chain through marine life and end up on dinner tables.

Fisherfolk working in polluted waters suffer from skin infections, respiratory problems and stomach diseases. Their livelihoods and health are both under attack. It's a bitter irony: those least responsible for the city's waste are suffering its worst effects, echoing the claims made by Pakistan's government at international fora about the terrible impact of climate change on those least responsible for creating the problem.

The danger extends inland. Untreated sewage breeds cholera, hepatitis and gastroenteritis. Beachgoers at Clifton or Hawke's Bay expose themselves to infected waters. Children fall ill. Even the air carries the foul stench of decay.

The economic toll is also steep. Pakistan earns about \$500 million a year from seafood exports, with Karachi handling about 70 per cent of the trade. International buyers are growing increasingly wary of Pakistan's seafood.

Tourism, another potential money spinner for Sindh, is equally affected. Karachi's beaches – Clifton, Hawke's Bay, Sandspit – could rival global coastal attractions. Instead, they've turned into dumping grounds for crud.

The AGP's report also exposes a threat rarely discussed: the damage to Pakistan's maritime assets. Polluted seawater accelerates metal corrosion. Ships, submarines and port equipment such as hydrographic equipment, anchors and other installations deteriorate faster in Karachi's harbor than in cleaner waters. Estimates suggest this pollution reduces vessel lifespan by nearly a third.

The cost of repairs to naval and commercial fleets runs into billions. Floating debris, especially plastics, clogs the cooling systems of boats and fast-response vessels. Engines overheat or fail. The total cost over service careers for repairs to ships, submarines and equipment for

the Pakistan Navy alone is projected to be in the billions of dollars.

Even desalination plants that are critical for Karachi's freshwater supply are threatened. Polluted seawater with high chemical loads can shut them down or make operations too costly. The lack of proper sewage management directly impacts the safety of Karachi's water supply.

The audit noted that Reverse Osmosis (RO) Water Desalination Plants, such as those in Muwach Goth and Musharraf Colony, were not producing water as per WHO Standards. For instance, the plant at Muwach Goth produced water with 2,200 parts per million (ppm) of Total Dissolved Solids (TDS) which is four times the safe standard of 500 ppm.

What makes this catastrophe particularly maddening is its preventability. The audit reveals that the sewerage system has received "very little maintenance since 1960". Between 1998 and 2017, Karachi's population surged by 63 per cent, generating 137 per cent more sewage. The KWSB conducted no studies, made no plans and took no meaningful action to accommodate this growth.

Take the vital S-III Project, designed to cater to the city's overall sewerage needs, which was approved in 2007. Nothing happened till 2018 when a revised plan set a 36-month completion deadline – meaning the project should have been finally completed by 2021. Four years later, it remains incomplete. When auditors asked for documentation, management refused to provide key records, displaying a contempt for accountability. This is a governance failure at the most fundamental level.

The audit's recommendations aren't technically complex: operationalise the three existing treatment plants; complete the S-III Project; establish uniform management standards; clear illegal encroachments from sewer lines; align sanitation goals with Pakistan's Sustainable Development Goals commitments; commission demographic studies to guide infrastructure investment; and provide documentation to auditors.

None of this requires breakthrough technology or foreign consultants. What it demands is something that has been conspicuously absent: political will and administrative discipline.

Karachi's sewage crisis is a story about institutional inertia and decay, but it's also about whose suffering matters. The fisherfolk with skin infections. The families in informal settlements who have never had sewerage access. Their voices don't echo in the corridors where decisions are made or, more accurately, where decisions go to die.

In a functioning democracy with accountability, such a massive failure of governance would spark outrage, force resignations and drive reform. The question for Karachi, and for Pakistan, is whether the political system can respond to the crises that result in a daily 689 Olympic-sized swimming pools' worth of sewage pouring into the Arabian Sea. ■

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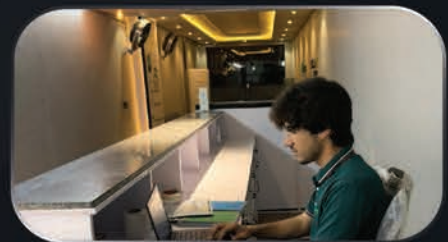
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