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FROM THE

Editor's desk...

Petrol Price Punishment

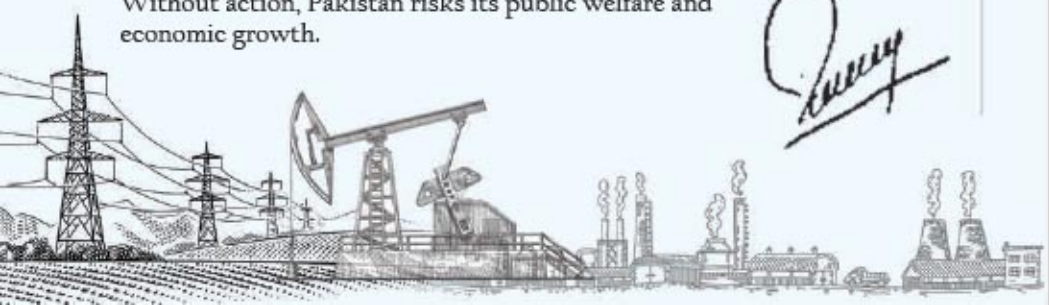
The federal government on 01 June 2025 raised the price of petrol by Rs8.36 per litre and high-speed diesel by Rs10.39 per litre. Later on July 16, it also raised the prices of both petrol and diesel, with the rates climbing by Rs4.80 and Rs7.95 per litre, respectively. The government's these hikes show its negativity in view of its claims of reducing price hike as the new rise in oil prices will directly affect purchasing power of people and multiply cost of businesses besides creating new economic challenges.

Over the last five years, Pakistan has undergone alarming hikes in petrol and gas prices due to bad governance and acceptance of the IMF dictation. This trend has placed immense pressure on the country's economy, destabilizing both public welfare and industrial productivity. Petroleum products, including petrol, diesel, and furnace oil, serve as the backbone of Pakistan's transportation, agriculture, and manufacturing sectors. When their prices rise, the ripple effects are felt across every stratum of society. In recent times, these hikes have become more frequent and severe, which shows the government is not interested in providing relief to the public being affected by skyrocketing price hikes.

The most direct impact of rising petroleum prices is seen in inflation. Transportation costs skyrocket, and so do prices of everyday goods. From vegetables to medicines, every commodity that depends on logistics becomes more expensive. As fuel prices rise, public transport fares increase, burdening the common man who earns minimum wage or relies on daily income.

The people have been forced to cut back on food, healthcare, and education. Many children are being withdrawn from schools to help with family earnings or reduce expenses. Malnutrition is on the rise, and healthcare costs have become unbearable for many. The cost of importing raw materials has also increased due to higher logistics costs, putting further strain on Pakistan's already troubled balance of payments. Uncertainty and financial stress have caused a rise in mental health problems. The anxiety over monthly expenses, inability to pay bills, and lack of hope for economic stability is increasing crime and domestic violence in urban and rural settings.

The government should come forward with concrete measures and a positive approach to reduce prices of petroleum products for bringing mercy on common people and to ensure economic well-being of industries and businesses. There is a dire need to promote renewable energy, particularly solar power, to reduce fuel import dependency. It is also mandatory to lower fuel taxes to reduce burden, and enforce transparency in pricing and supply chain management as the future depends on structural reforms, targeted financial relief, and investment in energy efficiency and domestic production. Without action, Pakistan risks its public welfare and economic growth.



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Monthly Energy Update
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REGISTRATION # DCO/DDO/LAW/CDGK-41/2006
Published by M. Naeem Qureshi for Energy Update
& Printed at Print Vision, Karachi Cell: 0333-2244586

Preserving Pakistan's Wind Power Industry

M. Naeem Qureshi

Writer is Managing Editor
Energy Update

As the Government of Pakistan moves toward finalizing revised Power Purchase Agreements (PPAs) with operational wind power projects, a critical decision point has emerged—one that could either sustain the long-term growth of the renewable energy (RE) sector or irreparably damage one of Pakistan's most promising clean energy success stories.

Currently, 36 wind power projects with a total capacity of 1,845 MW are operational across the country, with the majority located in the Gharo – Jhimpir wind corridor in Sindh. This region, identified for its high wind potential, represents Pakistan's best chance at reducing its dependence on imported fossil fuels and achieving energy security. Yet, despite their capacity, these projects contribute less than 5% to the national energy mix—a situation driven not by lack of investment or generation potential, but by systemic issues such as grid limitations, operational constraints and policy unpredictability, often resulting in grid instability and forced curtailments.

Alignment with National and International Commitments

Although inconsistently implemented, Pakistan has committed to ambitious national targets to increase the share of renewable energy in its power mix under its Alternative & Renewable Energy Policy and the Nationally Determined Contributions (NDCs) submitted under the Paris Agreement.

Economic Stability Through Reduced Fuel Imports

Wind energy, a zero-fuel-cost resource, directly offsets dependence on fossil fuel imports. Every megawatt-hour generated by wind displaces expensive fossil-based generation and eases pressure on foreign reserves. Undermining this sector increases long-term exposure to volatile international fuel markets and weakens Pakistan's macroeconomic position.

Uplifting Marginalized Communities

The wind power industry has created thousands of direct and indirect jobs —many for residents of underdeveloped communities belong to rural parts of Sindh. These are not just temporary construction jobs, but long-term positions in operations, security, logistics, and maintenance. In an area historically left behind by industrial development, these jobs have enabled families to break cycles of poverty and access basic services. Also, these employment opportunities have provided economic stability in regions previously overlooked in national development agendas.

Catalysing Rural Infrastructure and Social Development

The establishment of wind farms has acted as a catalyst for widespread socio-economic upliftment. The presence of wind projects has transformed the local landscape. Roads, access to

Unrealistic Tariff Reductions Could Undermine National Energy, Economic, and Climate Goals

clean drinking water, digital connectivity, telecommunications, solar electrification, improved access to healthcare, medical camps, schools, and vocational training centres have all been established or upgraded as part of corporate social responsibility (CSR) programs led by these projects. Such interventions often exceed what public funding could deliver, and in many cases, are the sole source of public services in these communities. Local entrepreneurship has also flourished through micro-loans and solar-powered enterprises.

Corporate Social Responsibility (CSR) and ESG Impact

These 36 wind projects have collectively undertaken extensive CSR initiatives aligned with Environmental, Social, and Governance (ESG) targets. Their contributions in health, education, and basic amenities have brought tangible benefits to communities that were previously underserved. From providing health and education services to facilitating inclusive employment policies, these projects have earned a strong social license to operate. Any abrupt tariff revision without consultation could jeopardize these community relationships and derail years of grassroots development.

Policy Credibility and Investor Trust Must Not Be Compromised

Perhaps most critically, these 36 wind power projects were established in a challenging economic environment, under the prevailing government policy and regulatory frameworks. Investors complied in good faith with the approved tariff structures and contractual obligations. Subjecting them now to retrospective and punitive tariff revisions, despite their full compliance, risks eroding investor trust, raises serious questions about regulatory reliability and contract sanctity in Pakistan —sending a discouraging signal to prospective investors at a time when the country desperately needs sustainable, climate-resilient infrastructure investment. Trust, once broken, is hard to rebuild.

The decision to revisit wind tariffs must not be approached as a routine fiscal adjustment. It is a strategic energy decision that has the power to either reinforce Pakistan's clean energy trajectory or derail it entirely. Policymakers must remember: short-term savings today could cost the country long-term investment, economic stability, and climate resilience tomorrow. Pakistan's wind power industry deserves to be protected, expanded, and celebrated—not penalized. ■

US Investors Encouraged to Tap into Pakistan's Mineral Wealth

EU Report

Federal Minister for Energy Ali Pervaiz Malik has called on American investors to explore Pakistan's vast and largely untapped mineral resources, offering opportunities for public-private partnerships and joint ventures in the mining sector. Speaking at a high-level webinar titled "Opportunities in Pakistan's Mining Sector – Unlocking Mineral Potential", co-hosted by the Ministry of Energy and the US Embassy in Pakistan, the minister highlighted the country's rich deposits of gold, copper, coal, rare earth elements, and other critical minerals vital for the global clean energy transition. "The Government of Pakistan, along with the Special Investment Facilitation Council (SIFC), is committed to easing entry for international companies and ensuring a conducive environment for sustainable mining ventures," said Mr. Malik. He underscored Pakistan's growing role in the global shift towards renewable energy, noting that mining of critical minerals is essential for achieving national climate and economic goals.

He cited the globally significant Reko Diq copper-gold project and recent promising discoveries in Balochistan's Chaghi district and KP's Waziristan region as indicators of Pakistan's mineral potential. Mr. Malik also praised the success of the Pakistan Minerals Investment Forum 2025 (PMIF25), which drew over 5,000 participants and elevated Pakistan's profile in the international mining community. US Chargé d'Affaires Natalie Baker reaffirmed the strong economic partnership between the United States and Pakistan, calling Reko Diq "one of the world's largest undeveloped copper and gold deposits." She welcomed Pakistan's policy reforms and pledged continued US support to facilitate American businesses in the sector. ■

Trump's Iran oil post raises trade hopes in Pakistan

Zebunnisa Burki

Trump's surprise nod to China buying Iranian oil has triggered cautious optimism in Pakistan, where economists and policymakers say the move could lower oil prices, ease import pressures and potentially revive the long-stalled Iran-Pakistan gas pipeline — if sanctions are meaningfully relaxed.

US President Donald Trump appeared to have taken an unexpected policy U-turn regarding US sanctions on Iran, giving China the green light to carry on buying its oil. Trump's Truth Social post, a surprise to both domestic and global audiences, said that China can "continue to purchase oil from Iran" and that "hopefully, they will be purchasing plenty from the US, also".

According to Bloomberg, this move could be an effort "to send positive signals to Beijing as he seeks a new tariff deal, and could potentially ease legal risks around China's buying of Iranian oil, but its impact on actual oil flows is unclear". But does this affect Pakistan? And if so, how? For macroeconomist Ammar Habib Khan, this means that "sanctions on Iran will slowly be removed as Trump believes more in trade. For Pakistan, that would mean formal trade, he says, explaining that otherwise Pakistan's trade with Iran "was informal, through smuggling".

Analysing Trump's Iran oil post, Dr Sajid Amin, senior economist at the Sustainable Development Policy Institute (SDPI), says that it suggests the "US may relax sanctions.

224 EXTREME NATURAL DISASTER EVENTS EXPERIENCED IN 44 YEARS

Escalating climate crisis poses existential threat to Pakistan: New Survey

The country is bearing catastrophic climate impacts, although most of greenhouse gas emissions are from large industrialized countries; United Nations Sustainable Development Goal 13 appeals for urgent action on climate change, which hinges on funding as well as nationally determined contributions

Special Report by Mansoor

The escalating climate crisis poses an existential threat to Pakistan. Extreme weather patterns, rising temperatures, and erratic rainfall are increasing in frequency and intensity as the world crosses the crucial 1.5°C threshold. Pakistan is bearing catastrophic climate impacts although most of the greenhouse gas emissions are from large industrialized countries. Climate change is no longer a myth but an urgent reality. The high vulnerability of Pakistan calls for reducing global emissions and creating improved adaptive response strategies locally.

According to the new Pakistan Economic Survey 2025, The United Nations Sustainable Development Goal (SDG) 13 appeals for urgent action on climate change, which hinges on funding as well as nationally determined contributions, since both of these play a key role in mitigating the risks of disasters. Pakistan is playing its part to respond to climate change through projects such as the National Adaptation Plan and the Recharge Pakistan Project.

Between 1980-2024, Pakistan experienced 224 extreme natural disaster events. Among these disasters, floods have become the most catastrophic threat in terms of economic damage and have impacted a vast population. With 109 occurrences across various subtypes of (flash, riverine, and general) floods, have affected more than 100 million individuals and inflicted a total damage of US$ 36.4 billion (Table 1), economic losses set aside. This disproportionately high impact underscores climate injustice.

Additionally, extreme temperatures, particularly heatwaves, are emerging as an ever-deadlier threat, accounting for 2,741 fatalities in 13 events. Tropical cyclones, although just five in number, in-

flicted more than US$ 1.7 billion in damages. Droughts, with two reported occurrences, have still affected more than 6.9 million individuals severely and resulted in US$ 247 million of damages, highlighting the severity of the disaster and its consequences on Pakistan's agrarian economy. Pakistan is one of the most susceptible to climate-related disasters, despite making a negligible contribution to global greenhouse gas emissions. In this context, Pakistan continues to experience an alarming increase in climate-related disasters, from extreme heatwaves and monsoon floods to GLOF and air pollution, with 2024 setting yet another record for heat and rainfall anomalies.

The economic and social costs are already profound, as evidenced by the devastating 2010 and 2022 floods, which caused billions of dollars in damages and forced massive displacement and high future capital investment. As these challenges intensify, Pakistan's climate profile is increasingly mirroring global trends of heightened variability and distress, making the country's resilience dependent on urgent, coordinated action at multiple levels. Government initiatives, especially at the federal level, indicate a growing institutional recognition of the climate emergency in response to the increasing climate risks. Initiatives such as the National Adaptation Plan, the Recharge Pakistan Project, and mainstreaming climate in PFM tools reflect meaningful progress and seriousness of the government's commitment to the climate change phenomenon. Complementing these efforts, provinces are also taking proactive measures, demonstrating a multi-tiered effort to combat climate change.

However, given the scope and pace of climate change, even more concerted, well-funded global solidarity and climate justice

are required along with efforts at the national level. Climate justice demands that developed and emerging countries take greater responsibility for their anthropogenically introduced climate change and uphold the pledges made at the Paris Agreement and

COP29, to prevent climate-vulnerable countries such as Pakistan from being left to suffer the consequences of a crisis they did not cause.

Moving forward, vulnerability can be transformed into resilience through consistent investment in renewable energy, climate-smart infrastructure, and ecosystem restoration. By aligning global support with efforts made at the national level, Pakistan can not only mitigate the climate crisis, but also ensure safer and more sustainable future.

The year 2024 witnessed severe climate phenomena in Pakistan, characterized by extreme heat, unpredictable rainfall, and regional disparities, highlighting the increasing effects of climate change in the country. These climatic anomalies included both elevated rainfall and enhanced temperatures. At the national level, Pakistan received 31 percent more rainfall than usual, amounting to 390.0 mm, and the yearly average temperature increased to 23.52°C (0.71°C higher than

normal), demonstrating a significantly warmer and wetter year on average. Figure 2 depicts climate events occurred during 2024, reported by the Pakistan Meteorological Department.

According to the Pakistan Meteorological Department, Sindh and Balochistan emerged as the most climatically extreme regions. Sindh recorded a staggering 94 percent increase in annual rainfall and witnessed the hottest day of the year at Mohenjo- Daro with 52.5°C on May 26. Jacobabad marked the warmest month, averaging 46.3°C in May. In addition, the province was also affected by Tropical Cyclone ASNA between August 30th to September 2nd

Balochistan experienced 82 percent increase in rainfall, but also held the record for the driest place (Nokkundi, 45 mm annually). Pakistan experienced its warmest night at Sibbi (36°C on May 28-29), along with Turbat being the warmest place with the temperature reaching 36.1°C. Punjab experienced an 18 percent rise in rainfall and recorded the wettest day (337 mm) and wettest month (603 mm) at Lahore in August, underlining heavy monsoon occurrence.

Khyber Pakhtunkhwa saw a modest 4 percent increase in rain and recorded the coldest day of the year at Malam Jabba (-2.0°C on February 19). In contrast, northern regions faced reduced precipitation, with Gilgit-Baltistan (GB) receiving 12 percent less rain and Azad Jammu and Kashmir (AJK) 13 percent less. However, Malam Jabba in AJK still emerged as the wettest place in Pakistan with 1789 mm annual rainfall. Gilgit-Baltistan also recorded extreme cold, with Kalam hitting -14°C on the coldest night and - 8.6°C as the coldest month's average in February 2024.

Although Pakistan generates less than 1 percent of global GHG emissions, it stands in the first rank among the top ten countries affected by climate change based on the Climate Risk Index2 (CRI) 2022.The report conducted a 30-year assessment (1993-2022), which positions Pakistan among countries frequently encountering extreme weather events. In the 'continuous threats' category, Pakistan is experiencing increasingly frequent and severe extreme weather events that are becoming the new normal.

Climate change is not only increasing the frequency of these events but also intensifying their impacts and prolonging their duration. Pakistan's geographical location further exacerbates its vulnerability to these climate-induced threats. The country is surrounded by three mountain ranges with glaciers, along with ice caps, in addition to continuous exposure to warm Arabian Sea temperatures. This makes the country highly susceptible to extreme weather events, including floods, droughts, and Glacial Lake Outburst Floods (GLOFs). ■

OUR AMBITION IS TO ESTABLISH SOGO AS A GLOBAL LEADER IN SOLAR ENERGY SECTOR

THE COMPANY CEO SAYS INTERNATIONALLY, WE ARE EXPANDING OUR FOOTPRINT IN MARKETS WITH SIMILAR ENERGY CHALLENGES, SUCH AS THE UAE, SAUDI ARABIA, AND PARTS OF AFRICA; SHOWS CONCERN OVER DELAYS IN NET METERING APPROVALS; WHILE MANY WERE ENJOYING THEIR EARLY 20S CASUALLY, I CHOSE TO TAKE ON THE RESPONSIBILITY OF LAUNCHING SOGO SOLAR SOLUTIONS AT THE AGE OF 21

Shoaib Jafrani,
CEO, SOGO Solar Solutions

Mustafa Tahir

Energy Update conducted an interview with SHOAIB JAFRANI, CEO, SOGO Solar Solutions & Director, SOGO Group of Companies, in which he said that at SOGO, their focus has been to make solar energy accessible, reliable, and future-ready for a wide spectrum of clients across Pakistan. We've successfully completed numerous industrial, commercial, and residential projects nationwide, from metropolitan cities like Karachi and Lahore to more remote regions in Sindh and Punjab. Our project footprint includes textile mills, packaging industries, real estate developments, hospitals, schools, and hundreds of homes.. The details of the interview are as follows:

Q. Coming from a family business background, what inspired you to continue in this field rather than pursue a different career?

Ans: Being raised in a business-oriented family, I was always surrounded by discussions on strategy, profits, losses, innovation, and growth. It wasn't just about continuing a legacy but about taking it forward with a fresh perspective. Seeing how business decisions impact the lives of employees, customers, and the economy that motivated me to contribute meaningfully. Rather than starting something completely separate, I found a way to blend my vision with our family's deep-rooted expertise, transforming SOGO Group from a product focused business into a comprehensive service provider through SOGO Solar Solutions, further strengthening our presence in the renewable energy sector, where

we've been actively contributing since 2008.

2. As a young leader in the renewable energy industry, what unique challenges do you face in leading SOGO Group through a sector that is rapidly evolving, and how do you tackle these challenges?

Ans: Being one of the youngest CEOs in a traditionally senior-dominated industry definitely presents both challenges and opportunities. I knew from the start that I had to prove myself through performance, not just position. While many were enjoying their early 20s casually, I chose to take on the responsibility of launching SOGO Solar Solutions at 21.

One of the biggest challenges is staying ahead of the curve while building long-term trust. The solar industry is evolving rapidly with changes in technology, regulations, and customer expectations. I've tackled this by surrounding myself with a capable, experienced team, continuously educating myself through global exposure, and staying deeply involved in every strategic decision.

3. SOGO Group has made significant strides in the renewable energy sector, especially in solar energy. Can you provide an update on the current status of your solar energy projects across Pakistan?

Ans: At SOGO, our focus has been to make solar energy accessible, reliable, and future-ready for a wide spectrum of clients across Pakistan. We've successfully completed numerous industrial, commercial, and residential projects nationwide, from metropolitan cities like Karachi and Lahore to more remote regions in Sindh and Punjab. Our project footprint includes textile mills, packaging industries, real estate developments, hospitals, schools, and hundreds of homes.

We are now expanding operations across Sindh and Punjab more aggressively, aiming to cover underserved industrial areas where solar can directly reduce production costs. With our inhouse product line of solar panels, inverters, lithium batteries, and soon-to-launch EV products, we're creating an integrated ecosystem where end-to-end energy solutions are available under one trusted brand: SOGO.

4. The recent imposition of a 10% sales tax on solar panels has raised concerns about affordability and adoption. How is SOGO Group addressing this challenge, and what's your perspective on this policy?

Ans: The government's decision to impose a 10% sales tax on solar panels has naturally raised concerns, especially for end consumers. While it's true that this may impact affordability in the short term, we believe that the government is taking a long-term, strategic view of the renewable energy sector. As industry stakeholders, it's important for us to support such policy shifts with trust and adaptability.

That said, this also underscores a critical need for local solar manufacturing. Instead of relying heavily on imports, the focus should now be on building and supporting a domestic manufacturing ecosystem, which can significantly reduce dependency on foreign markets, control prices, create jobs, and boost the local economy.

At SOGO Group, we've anticipated this shift. We already operate a manufacturing plant in China and are now in the process of establishing a state of the art solar production facility in Pakistan, spread across 11 acres. This facility will allow us to manufacture solar panels, inverters, and lithium batteries locally, bringing down costs.

We believe the government can play a pivotal role in accelerating this transition by incentivizing and subsidizing local manufacturers, making Pakistan not just an adopter of clean energy, but a producer and exporter of it. We're committed to working hand in hand with the government and industry stakeholders to make this vision a reality.

5. What are the key barriers to scaling up solar adoption in Pakistan, and how can public-private partnerships help in accelerating this shift?

Ans: Scaling solar in Pakistan is not just about technology; it's about building trust, accessibility, and long-term value.

Pakistan's solar adoption faces several hurdles, from regulatory uncertainty and limited financing to import dependency and a shortage of skilled technicians, which often affects installation quality and after-sales service. Delays in net metering approvals and low public awareness further slow down adoption, especially for households and SMEs.

Public-private partnerships can be a game changer. With clear policies, local manufacturing support, and targeted subsidies from the government and innovation, service, and outreach from the private sector can make solar both accessible and scalable. Financing models tailored for SMEs and rural users, along with awareness and training programs, can drive long-term impact.

At SOGO, we believe energy independence requires shared responsibility. Through collaboration and smart policy, clean energy can become a trusted, everyday reality for all Pakistanis, not just a luxury.

6. Looking ahead, what is SOGO Group's long-term vision for solar and renewable energy, especially in terms of innovation, international collaboration, and expanding access for residential and industrial consumers?

Ans: Our ambition is to establish SOGO as a global leader in the solar energy sector by continuously expanding our product portfolio not just within Pakistan but across emerging energy markets globally. We're actively investing in AI-powered smart energy systems and Battery Energy Storage Systems (BESS) to help large-scale industries operate independently from the grid, moving closer to the dream of true energy autonomy.

Internationally, we are expanding our footprint in markets with similar energy challenges, such as the UAE, Saudi Arabia, and parts of Africa. These markets mirror the energy challenges Pakistan faces, and we aim to offer scalable, innovative solutions tailored to their needs. ■

CPHGC's Local Procurement Strategy Fuels Sustainable Economic Growth in Pakistan

Since its establishment, the China Power Hub Generation Company (CPHGC) has actively promoted local procurement practices, blending operational priorities with the broader objective of contributing to Pakistan's economic advancement. This strategic orientation underscores the company's dedication to responsible sourcing and long-term sustainability.

Central to CPHGC's approach has been the emphasis on strengthening local supply chains. By prioritising the acquisition of essential spare parts and services from within the country, the company has not only ensured the seamless operation of its power plant but also reduced dependency on foreign suppliers. This focus has helped maintain the facility's efficiency and reliability, even during periods of external disruption.

The value of this approach became particularly evident during the COVID-19 pandemic. As international supply routes were significantly disrupted, CPHGC's commitment to local procurement proved instrumental in sustaining operations. The company continued to deliver a stable supply of electricity to the national grid, highlighting the robustness and adaptability of its supply chain strategy.

Beyond operational resilience, CPHGC's procurement policies have had a tangible impact on Pakistan's economic landscape. By working with domestic vendors, the company has contributed to economic stimulation, facilitating the growth of local enterprises and supporting job creation. This has provided a vital boost to entrepreneurship and innovation across multiple sectors, reinforcing the company's role as a catalyst for broader socio-economic development. In parallel, CPHGC's Commercial team has focused on cultivating sustainable relationships with qualified local suppliers.

This expansion of its vendor base has been carried out with a strong emphasis on maintaining quality, ethical business practices, and compliance with regulatory standards. These long-term partnerships are pivotal in building a resilient, transparent, and reliable supply ecosystem.

Moreover, the company's efforts have led to improvements in the agility and responsiveness of its supply chain, alongside enhanced cost efficiency. These outcomes align closely with CPHGC's core values of environmental stewardship and social responsibility. By embedding sustainability into its procurement strategy, the company ensures that its growth benefits are shared more broadly and equitably.

Through its ongoing commitment to local sourcing, CPHGC continues to play a vital role in empowering Pakistan's economy. The company's strategic initiatives reflect its broader mission of promoting inclusive and sustainable development, while ensuring the uninterrupted delivery of power to the nation. ■

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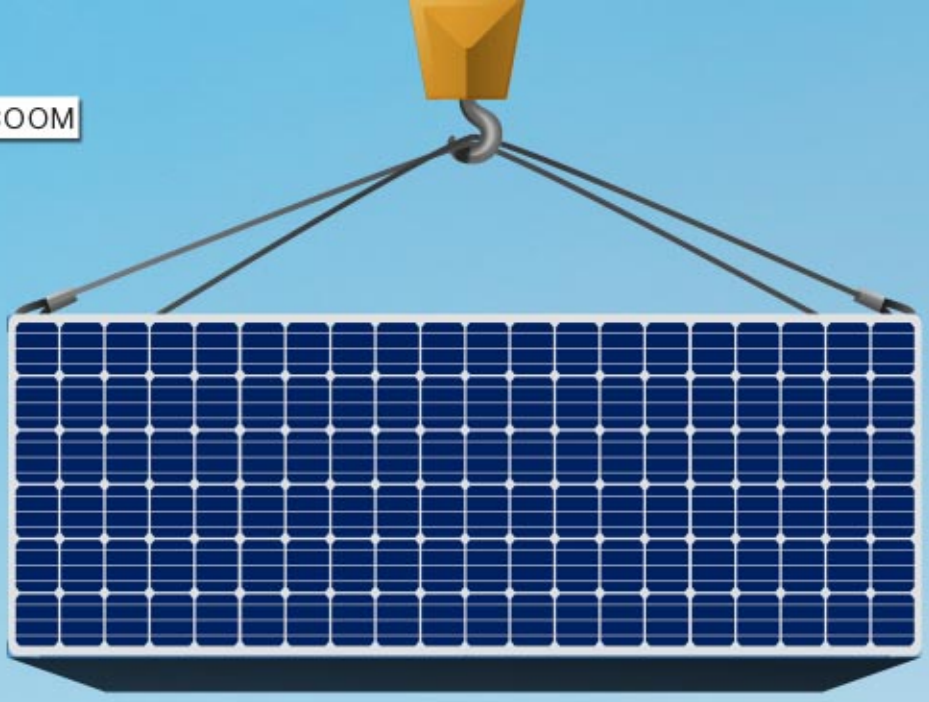

Is solar power just for the privileged?

Pakistan among world's largest solar-panel importers, outpacing many industrialised economies; on-grid, net-metered capacity has jumped from 1.3GW in mid-2023 to about 4.1GW by December 2024

Dr Rihab Khalid

The writer is a socio-technical feminist energy researcher, currently employed as a research associate at the MECS programme, Loughborough University, UK

Pakistan has surged onto the global solar scene with unprecedented speed. Customs data show the country imported an estimated 17–22GW of photovoltaic (PV) modules in 2024 alone, propelling it to the ranks of the world's largest solar-panel importers and outpacing many industrialised economies.

On-grid, net-metered capacity has jumped from 1.3GW in mid-2023 to about 4.1GW by December 2024, now spread across some 283,000 residential, commercial and industrial consumers. At first glance, these surging numbers paint a very positive picture for the country's climate agenda: solar generated 14 per cent of Pakistan's electricity in 2024, up from just 4.0 per cent in 2021, moving the country closer to its Nationally Determined Contribution (NDC) pledge to source 60 per cent of its power from renewables and cut projected greenhouse-gas emissions in half by 2030.

However, this success has also been marred by significant concerns for the national grid. Power-sector regulators and independent power producers (IPPs) warn that wealthy households leaving the grid are eroding the revenue base that cross-subsidises other customers, while reverse flows destabilise a transmission system built for one-way traffic.

A couple of weeks back, the government approved draft rules that slash the buy-back tariff for solar exports from Rs27 to Rs10 per unit and convert net-metering into net-billing. Energy Minister Sardar Awais Leghari insists the scheme is being "reformed, not scrapped", but concedes that its rapid growth is impacting the national grid and shifting costs onto poorer consumers.

Solar panels: improving solidarity or increasing divides? The reform debate has exposed a distributional fault-line that has barely been addressed in Pakistan's energy discourse: access to solar is overwhelmingly class-based. News reports noted that 156,000 distributed generation licences – totalling 2.2GW – were in place by June 30, 2024, more than double the previous year. Yet evidence shows that over 70 per cent of net-metering households in the country

are located in the high-income areas of Karachi, Lahore, Rawalpindi and Islamabad, leaving low-income neighbourhoods, dense apartment dwellers and informal settlements largely untouched.

Reporting from Karachi tells the same story on the ground. Market surveys find affluent homeowners spending about Rs625,000 on a typical 5kW rooftop array- well beyond the reach of low-income households. A study published in Reuters further highlighted these discrepancies in access, reporting that whilst affluent homeowners run solar-powered air-conditioners during 40 C heatwaves, residents in low-income neighbourhoods just miles away

ration power and skip meals to pay soaring bills. Load-shedding is also unevenly distributed, with K-Electric, the private utility that serves the city, continuing to impose six-to-ten-hour outages in low-income districts, citing theft and non-payment.

This pattern is not new. A 2016 ethnographic research in Lahore by this writer showed that early adopters in affluent households used solar mainly to sidestep chronic load-shedding; gleaming rooftop PV panels thus became more a symbol of social status rather than a tool to cut demand or emissions.

By contrast, my follow-up research in 2021 among low-income housing colonies found that poor tenants literally timed their cooking, studying and household routines to the grid's capricious schedule; rooftop solar remains an unreachable luxury for such households.

Fast-forward to 2025: cheaper panels have changed the price tag, not the politics. Imports may be booming, but net-metering still requires a registered deed, sanctioned load certificates, and the discretionary approval of distribution companies – documents many informal-settlement residents and rural-to-urban migrants living in low-income neighbourhoods simply do not possess. Battery storage, which will become inevitable under the newly instated, tighter solar net-metering rules, will likely deepen that affordability gap.

Such distributional injustices are not unique to Pakistan. Research from South Africa similarly shows that a privately led solar boom has quintupled rooftop capacity in two years, easing pressure on power cuts but risking what Cape Town journalists call an 'energy apartheid': municipalities lose revenue, the rich unplug, and blackouts bite harder in townships. Pakistani policymakers now face a similar dilemma: harnessing a bottom-up clean-energy transition without hollowing out the public grid that 100 million citizens still rely on.

Energy justice scholars conceptualise fairness into three pillars – distributional (who gets the benefits and burdens), procedural (who has a voice in decisions) and recognition (whose lived realities are acknowledged). Applied to Pakistan's solar transition, these pillars translate into five urgent actions:

1. Tiered incentives: redesign net-billing so buy-back rates decline with system size but rise for community or collective installations in low-income areas. Cross-subsidy is already implicit in the grid; make it explicit and progressive.

2. Targeted finance: channel concessional climate finance into guarantees for microloans, allowing renters and small businesses to purchase 1–2kW kits. Sindh's pilot programme of free panels for low-income households is a start, but coverage remains limited.

3. Public-interest data: Nepra should publish quarterly, geo-tagged net-metering statistics disaggregated by district, income band and gender of account holder. Without transparency, justice debates are condemned to anecdotes.

4. Inclusive grid planning: instead of penalising prosumers, utilities could partner with them; aggregating surplus daytime generation through virtual power plants and rewarding feeders that keep low-loss areas exempt from outages.

5. Gender-responsive design: women, who shoulder the bulk of domestic energy work, must be involved in decisions on siting, billing and after-sales service – lessons confirmed across the SDG5/7 intersection in both my own and international studies.

Beyond megawatts to justice-based energy transitions: Pakistan's solar surge is real and a critical step in reducing carbon emissions. But kilowatts alone do not constitute a just transition. Left to market forces, decentralised renewables can end up recreating the monopolies of the old centralised system – only this time the 'exclusive club' sits on thousands of private rooftops.

The government's instinct to slow the boom is understandable, but the real challenge is to steer it towards an equitable and just path. Equity-centred governance and inclusive policy must be at the heart of Pakistan's energy transition to ensure broad-based resilience.

Failing to do so will result in an outcome which looks less like a green revolution and more like a two-tier energy future – bright for some, perilously dim for the rest. ■

Govt to Stop Electricity Duty Through Bills

EU Report

Federal Energy Minister Awais Leghari has formally written to all provincial chief ministers, announcing the government's decision to discontinue the collection of Electricity Duty through power bills starting July 1, 2025. In his communication, Leghari urged provincial governments to support efforts to streamline billing by eliminating various add-on charges that burden consumers. He emphasized that already high electricity tariffs are made even more complex and confusing due to multiple taxes and levies being bundled into monthly bills. The minister underscored the federal government's ongoing reforms to bring down electricity costs, including renegotiating contracts with Independent Power Producers (IPPs), reducing Return on Equity (ROE) for state-run plants, and introducing structural changes to the power sector. "To ensure transparency, we aim to simplify electricity bills so they reflect only the true cost of consumption, rather than serving as a platform for collecting unrelated charges," Leghari stated. He called on provincial governments to explore alternative mechanisms for collecting levies and duties, stressing that the move would enhance clarity and fairness for consumers. Leghari expressed confidence that the initiative will lead to more understandable and transparent electricity billing, and reiterated the need for provincial collaboration in developing alternative revenue collection strategies.

Sindh Energy Holding Company achieves revenue target

EU Report

Sindh Energy Minister Nasir Shah has announced that the Sindh Energy Holding Company Limited (SEHCL), operating under his department, has achieved its revenue target of Rs113 million for the financial year 2024-25. During a meeting of the SEHCL that he chaired, Shah said that a revenue target of Rs266 million has been set for 2025-26. SEHCL COO Tufail Ahmed Khoso told the meeting that as a result of its strategic investments, the company is expected to continue generating an annual profit of Rs250 million for the next four years. It was further revealed that in 2023-24, the company had invested Rs34 million in the oil and gas sector, while in 2024-25, the investments rose to Rs105 million, which is a 209 per cent increase compared to the previous year. Shah ordered that the SEHCL only invest in oil and gas projects that offer guaranteed profits. He also ordered that a detailed summary of proposals related to the SEHCL be submitted to the chief minister to guide future planning and decisions in line with the CM's directives. ■

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RECYCLING BUDGET REVENUES

Revenue recycling can do more than meet RSF reform conditions

Dr 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 federal budget for FY2025–26 reveals more than just fiscal arithmetic. It reflects a shifting economic terrain shaped by IMF oversight, macroeconomic consolidation and the intensifying demands of climate resilience and low carbon development.

With a projected 25 per cent increase in direct taxes – from Rs5.5 trillion in FY25 to Rs6.9 trillion in FY26 – the government has signaled a serious attempt to broaden the tax base, formalise the economy and address the persistent fiscal deficit. Income tax receipts alone are set to rise by Rs1.36 trillion. Meanwhile, levies and fees are up by 20 per cent, and non-tax revenues have also registered a significant surge. These figures suggest a move toward enhanced resource mobilization. But they also raise an essential question: are we merely collecting more, or are we reallocating better?

Beyond the pursuit of higher revenues lies a transformative opportunity: how to rewire the budget through equitable revenue recycling. In essence, revenue recycling refers to the strategic redeployment of public revenues – especially those collected from distortionary or regressive instruments – into initiatives that deliver social protection, climate resilience and productive public investment.

What distinguishes recycling from routine budgeting is the principle of intentionality: the very source of revenue becomes tied to its reinvestment logic. Countries like Canada, Germany and Sweden have operationalised this through carbon pricing regimes where revenues from environmental taxes are redistributed via household rebates, energy efficiency subsidies or clean infrastructure projects.

This principle acquires heightened relevance in Pakistan's context. For the first time, the FY26 budget introduces a carbon levy of Rs2.5 per litre on both petrol and diesel. While modest in rate, it carries symbolic and structural weight. Together with the longstanding petroleum development levy, these fiscal tools generate considerable non-tax revenues. Yet, their current treatment as fungible general revenues, blended into the consolidated fund, dilutes both their purpose and impact. To unlock their developmental potential, the government must institutionalise a robust revenue recycling mechanism. This begins with earmarking 100 per cent of the carbon levy proceeds, and a significant share of the petroleum development levy, into the Pakistan Climate Fund established under the Climate Change Council and Authority.

Such earmarking is not just a technical measure but a governance imperative. By anchoring the recycling

of climate-related revenues to a dedicated institutional vehicle, Pakistan can enhance transparency, ensure outcome-based spending, and align fiscal policy with its Nationally Determined Contributions (NDCs). This approach also aligns with IMF's Resilience and Sustainability Facility (RSF), which calls for climate-linked fiscal reforms as a prerequisite for long-term macro-financial stability.

Several RSF actions, ranging from the adoption of the carbon levy to the activation of the Climate Fund and the mainstreaming of climate risk into public investment management, hinge on the transparent identification and utilization of green fiscal flows. Pakistan now has the opportunity to shift the narrative from externally imposed reforms to domestically grounded innovation.

Equitable recycling of these revenues would also have profound implications for tax morale and public trust in fiscal governance. When citizens witness tangible, targeted benefits – such as subsidies for rooftop solar, electric public transport, or flood-resilient infrastructure – they begin to see taxation not as a burden, but as an investment in collective well-being. This trust is essential in a country where the informal economy is vast, and perceptions of unfair taxation are deeply entrenched.

If the carbon levy, despite its regressive potential, is recycled into clean energy access for low-income households, the state will have taken a significant step toward restoring fiscal legitimacy. On the contrary, the newly proposed, 18 per cent GST on imported solar panels in the name of level playing field is a negative measure, the level playing field for domestic solar manufacturing can also be ensured through removal of GST on domestic panels.

This is where economic theory intersects with political economy. The Laffer Curve – often cited to caution against excessive taxation – suggests that beyond a certain threshold, increasing tax rates leads to reduced revenue due to evasion and compliance erosion.

The FY26 budget structure reinforces the urgency of this reallocation agenda. While direct taxes and other receipts have increased, indirect taxes have declined by three per cent, potentially indicating economic contraction or policy moderation. Civil administration receipts are down by four per cent, reflecting inefficiencies in non-tax collections. This mix calls for a rebalancing of fiscal strategy – from reliance on regressive consumption-based taxes to progressive, equity-oriented spending.

There are several high-impact avenues for deploying recycled funds. One is subsidising rooftop solar installations for protected and low-income consumers, reducing their dependence on high-cost grid electricity and simultaneously lowering the government's annual subsidy burden. Another is the development of electric bus corridors and charging infrastructure in major cities, which can decarbonize urban mobility and improve air quality. Revenues can also finance just transition programmes, such as vocational retraining for workers in fossil fuel sectors, and invest in water-efficient agriculture and local adaptation systems in flood-prone districts.

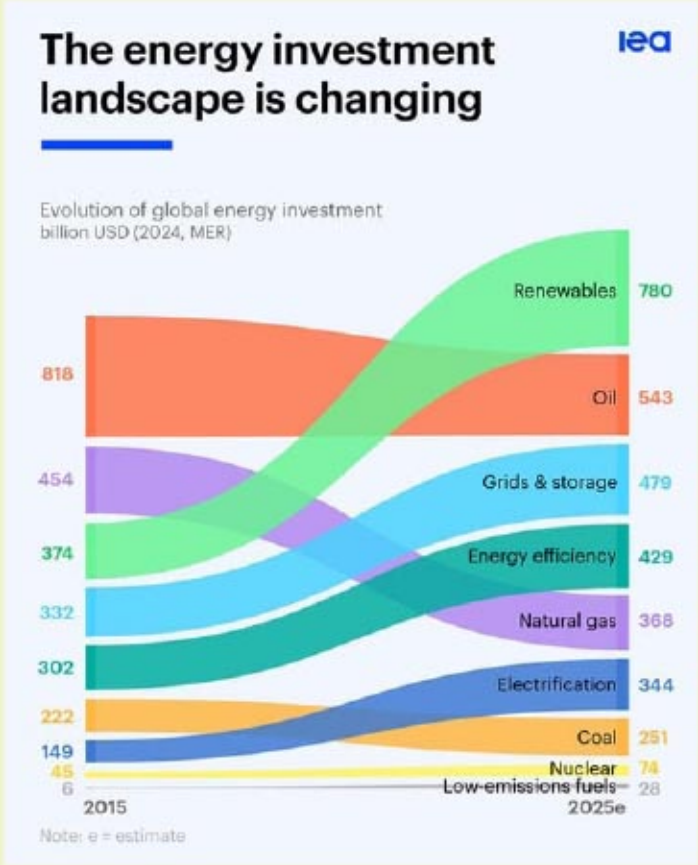
Ultimately, recycling budget revenue is not just about fiscal innovation but about reimagining the social contract. A carbon levy that burdens the poor while funding government overhead will only breed resentment. But a carbon levy that finances solar panels in working-class neighborhoods, electric buses in congested cities, and flood barriers in vulnerable districts becomes a tool of empowerment. Budget 2025-26 offers Pakistan a fork in the road: either continue extracting without reform, or embrace a regenerative fiscal strategy that recycles pain into progress.

To translate the promise of revenue recycling into action, the following targeted reforms are recommended. First, earmark all proceeds from the carbon levy and a substantial share of the petroleum levy to the Pakistan Climate Fund – moving beyond climate tagging to enforceable, transparent allocation. Second, establish a Revenue Recycling Unit within the Ministry of Finance, in collaboration with the Climate Ministry, to track, audit and report on recycled funds under parliamentary oversight.

Third, launch high-impact pilot projects – such as solar subsidies, green transit, and climate-resilient infrastructure – to build public trust and demonstrate results financed by recycled revenue of carbon levy and taxation. Fourth, incentivise climate-linked NFC allocations and devolve funding access to district-level governments to strengthen local ownership and equity in green spending.

Fifth, run a public awareness campaign linking the carbon levy to visible community benefits, boosting transparency, trust and voluntary compliance.

These reforms can transform revenue collection from a fiscal necessity into a tool for climate justice and sustainable development. If implemented with vision and discipline, revenue recycling can do more than meet RSF reform conditions. It can restore public faith in taxation, expand compliance and transform Pakistan's budget from a balance sheet of burdens into a blueprint for resilience. ■



In 2015, only 30% of energy investment was in electricity and electrification.

Today, 50% of it is in electricity and electrification.

Future of Smart Energy in Pakistan: Turning Vision into Reality

Over 90,000+ net-metering licenses have been issued so far; the country needs to act swiftly to modernize its energy landscape for independence and environmental protection

Mustafa Tahir

Writer is Deputy Editor Energy Update

As Pakistan faces mounting challenges in energy access, affordability, and sustainability, the concept of smart energy—leveraging digital technologies for efficient, secure, and environmentally friendly power—has emerged as a strategic necessity. With rising electricity demand, frequent power outages, and increasing fossil fuel import bills, smart energy offers a transformative solution for the country's energy crisis.

Current Landscape & Achievements

Pakistan's power generation capacity reached over 41,000 MW in 2024, but distribution losses, poor grid infrastructure, and an over-reliance on fossil fuels continue to cripple the sector. However, smart energy solutions are slowly taking root:

Advanced Metering Infrastructure (AMI): Piloted in cities like Islamabad and Lahore under DISCO reforms, AMI is helping utilities reduce theft and improve billing accuracy.

Net Metering: Over 90,000+ net-metering licenses have been issued (as of early 2025), adding nearly 2,000 MW of distributed solar power to the national grid.

Microgrids and Hybrid Systems: Deployed in remote Balochistan and northern regions, these systems are improving rural electrification with minimal transmission losses.

Government Policies & Initiatives

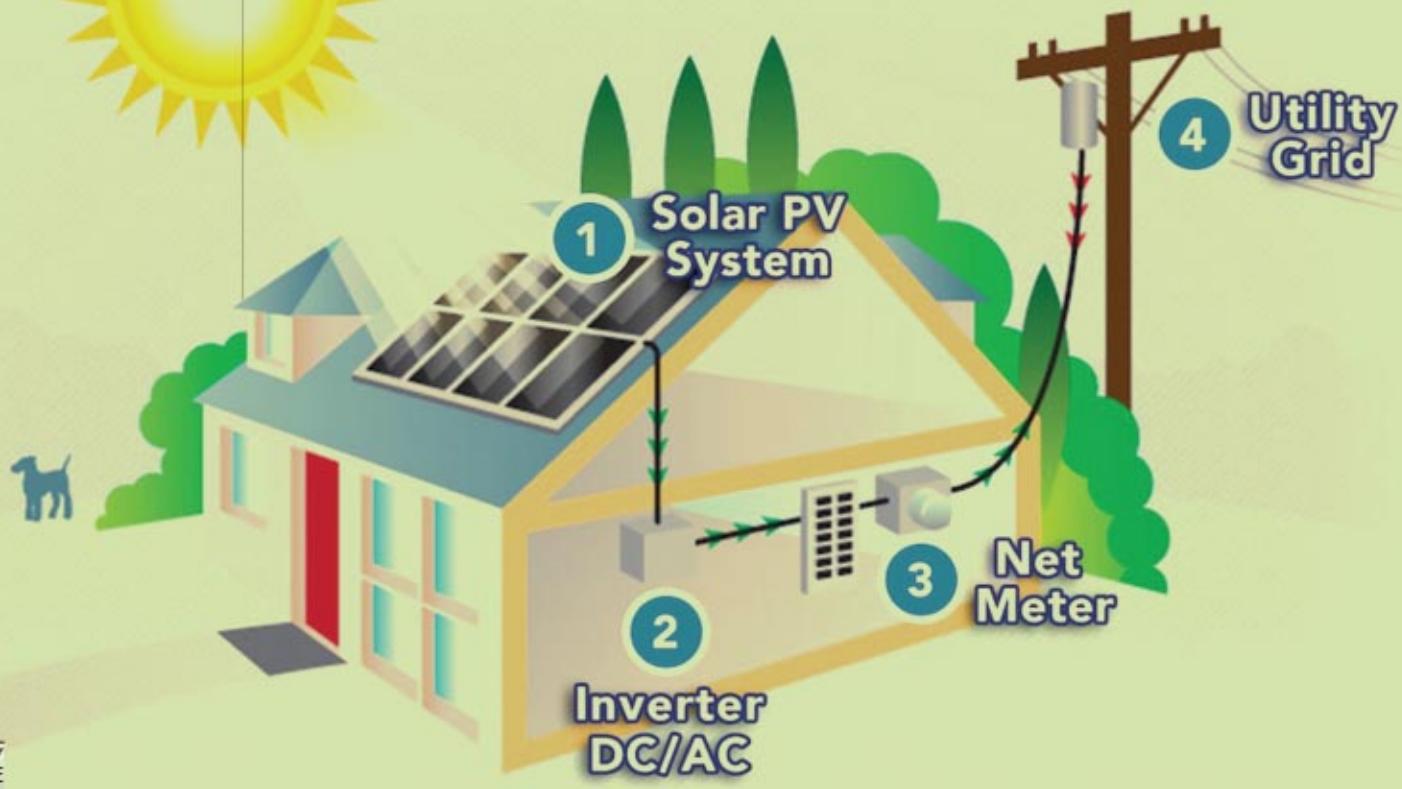
The Government of Pakistan has recognized the importance of smart energy through several key initiatives:

National Energy Efficiency & Conservation Policy 2023: Aims to cut energy intensity by 3% annually by promoting smart appliances, LED lights, and energy audits.

Alternative and Renewable Energy Policy (ARE-2019): Targets 60% renewable energy in the power mix by 2030, opening pathways for smart grid integration.

Digital Pakistan Vision: Encourages digital transformation in critical sectors, including energy, enabling real-time data analysis and smart grid development.

NEPRA's Grid Modernization Plan: Focus-



es on digitizing transmission and distribution networks to reduce losses and enhance load management.

Private Sector's Role in Smart Energy Development

The private sector in Pakistan is emerging as a critical driver of smart energy transformation through innovation, investment, and deployment:

Solar EPC Companies & Installers: Firms like Reon Energy, SkyElectric, Premier Energy, and others are installing smart solar systems integrated with inverters, net-metering, and monitoring apps.

Tech Companies: Startups are offering IoT-based smart meters, energy management software, and AI-driven analytics to help businesses optimize energy usage and cut costs.

Industrial Initiatives: Major textile and cement players are investing in rooftop solar with energy storage, reducing grid dependence and costs.

Energy Forums and Alliances: Industry bodies like the Pakistan Solar Association (PSA) and the Renewable Energy Association of Pakistan (REAP) are advocating for favorable policies, training programs, and standardization.

Charging Infrastructure Providers: Companies are collaborating with automotive brands and petroleum retailers to roll out EV charging networks, integrating solar and battery storage.

Private Investment Trends: Increasing investment in Battery Energy Storage Systems (BESS) to enhance reliability. Expansion of ESCO (Energy Service Company) models that offer performance-based energy savings. Participation in smart grid pilot projects in collaboration with public utilities and international donors.

What Other Countries Are Doing

Pakistan can draw valuable lessons from global leaders in smart energy:

India introduced over 2 million smart meters under the Smart Meter National Program (SMNP), helping reduce AT&C losses and improve grid stability.

China leads globally in smart grid deployment with advanced AI-based forecasting and demand-side management, supported by its "Energy Internet" initiative.

Germany implements dynamic pricing and decentralized renewable integration through its "Energiewende" strategy.

These countries demonstrate how policy coherence, investment in R&D, and consumer education are critical to scaling up smart energy systems.

Opportunities and Challenges

Opportunities: Local solar panel and inverter manufacturing, encouraged by the Solarization of Public Buildings initiative. Development of Battery Energy Storage Systems (BESS) for grid balancing. Expansion of Electric Vehicle (EV) charging networks powered by smart meters.

Challenges: Lack of skilled workforce for operating digital systems, data security and privacy issues in AMI rollout, and inconsistent policy enforcement across provinces.

The Way Forward

To realize the full potential of smart energy, Pakistan must establish a national Smart Energy Task Force for integrated planning; provide fiscal incentives for utilities and private firms investing in digital infrastructure; launch consumer awareness campaigns on energy conservation and smart technologies; and strengthen public-private partnerships for deploying AI, IoT, and blockchain-based energy solutions.

Conclusion

The future of smart energy in Pakistan lies in synergy—between public policy, private innovation, and consumer participation. With global momentum towards cleaner, smarter grids, Pakistan must act swiftly to modernize its energy landscape—not just for reliability and affordability, but for energy independence and environmental resilience. ■

PTV FEE EXEMPTION

Premier vows to continue championing solar power

Syed Irfan Raza

Prime Minister Shehbaz Sharif has pledged that his government would never discourage the country's solarisation boom, as he launched the 'Power Smart' mobile app to empower citizens and promote transparency in electricity billing under the 'Apna Meter, Apni Reading' initiative.

Addressing the launch ceremony in Islamabad, PM Shehbaz emphasised the government's support for renewable energy, calling solar power a vital and growing resource for the nation. "The government would not discourage the solarisation boom in the country, rather we welcomed the ongoing process, which is regarded as the most inexpensive way of producing electricity in the world," the prime minister said.

He noted that the rapid adoption of solar energy is a key trend in the country. "Pakistan is among the few countries where the solarisation process is rapidly taking place," he added. The premier identified the widening gap between high electricity production capacity and lower grid consumption due to solar adoption as a challenge the government is actively working to address.

The 'Power Smart' app introduced under the 'Apna Meter Apni Reading' initiative is designed to empower consumers by allowing them to take a photograph of their electricity meter on a specified date and upload it to the app. If a user provides a reading on the designated due date, that reading will be prioritised over any reading taken later by a utility employee, according to a statement from the Power Division.

"This is not just a technology feature but a solid reform in governance, which truly empowers consumers," the Power Division said. "With this system, consumers will not only be able to keep an eye on their bill, but now they will also be the guardians of the reading process."

The prime minister also announced the removal of the Pakistan Television (PTV) fee from electricity bills.

Currently, consumers are charged a Rs35 monthly PTV fee through their electricity bills. The PTV fee was a required charge in monthly electricity bills for years, however the government decided to abolish it to help households facing rising utility costs. ■

The cost of irrational energy levies

Kamran Arshad

The writer is Chairman APTMA— North Zone

The federal government's decision to impose a petroleum levy of Rs 77 per litre on furnace oil (HFO), supplemented by a carbon tax of Rs 2.50 per litre, adds Rs 84,742 per ton in taxes to a fuel that otherwise costs approximately Rs 130,000 per ton. For export-oriented textile manufacturers, many of whom depend on HFO-based captive power for uninterrupted production, this will severely undermine their viability.

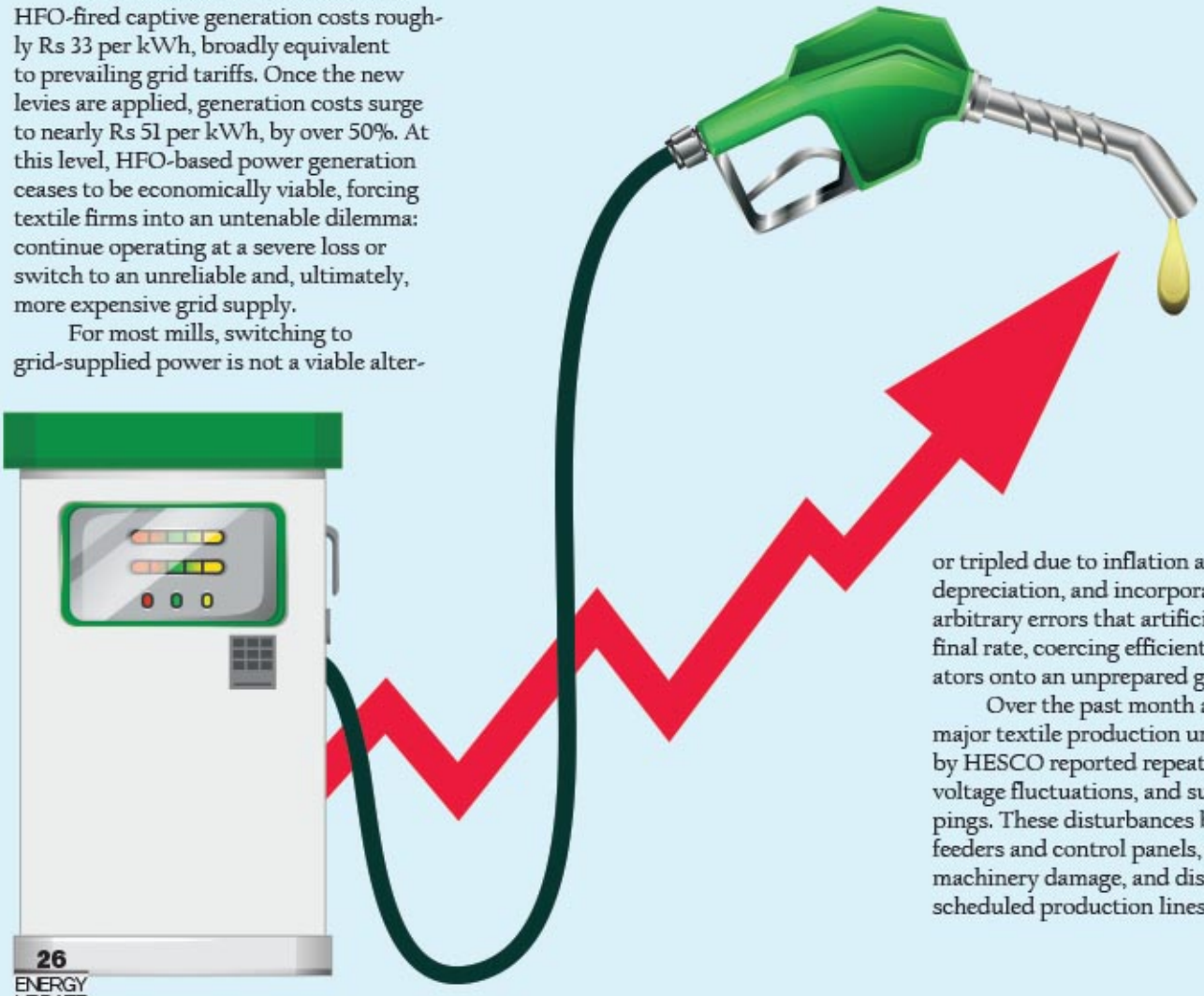
Under current market conditions, HFO-fired captive generation costs roughly Rs 33 per kWh, broadly equivalent to prevailing grid tariffs. Once the new levies are applied, generation costs surge to nearly Rs 51 per kWh, by over 50%. At this level, HFO-based power generation ceases to be economically viable, forcing textile firms into an untenable dilemma: continue operating at a severe loss or switch to an unreliable and, ultimately, more expensive grid supply.

For most mills, switching to grid-supplied power is not a viable alternative, as HFO-fired captive generation is principally used by units lacking reliable DISCO connections. Across Pakistan—and particularly in urban industrial hubs such as Lahore and Karachi—DISCOs routinely decline new industrial hookups due to constrained infrastructure and transformer capacity.

Where connections are technically offered, firms are presented with demand notices running into the tens of billions of rupees merely to secure a feeder line, with no guarantee of timely service: lead times for actual energization often extend to two or three years.

Under these conditions, pursuing a formal grid connection is neither commercially nor operationally feasible, aside from enduring the frequent voltage sags and load-shedding that characterize grid supply.

This punitive taxation of HFO follows the so-called "grid transition levy" on gas consumption by captive-power users—a tax that the government itself concedes is incorrectly calculated yet refuses to rectify. Officially, the transition levy is intended to align the cost of captive power with grid tariffs. In practice, however, the levy calculation is based on peak-hour grid rates that apply for only four hours each day, it relies on an eight-year-old Nepra determination of captive O&M costs, a figure that has since doubled or tripled due to inflation and currency depreciation, and incorporates a series of arbitrary errors that artificially inflate the final rate, coercing efficient captive generators onto an unprepared grid.



Over the past month alone, two major textile production units served by HESCO reported repeated outages, voltage fluctuations, and sudden trippings. These disturbances burned out feeders and control panels, inflicted heavy machinery damage, and disrupted tightly scheduled production lines. Similar

incidents are occurring across multiple DISCOs, underscoring that Pakistan's electricity grid lacks both the capacity and reliability to absorb additional industrial loads.

Rather than addressing these structural weaknesses through targeted grid investments, modernization of aging infrastructure, and expansion of generation capacity, the government has opted for a shortcut: tax all alternative energy sources until the grid becomes the sole available option. First gas, now HFO and even solar panels. On one hand, political rhetoric extols market-driven strategy and competitive pricing; on the other, regressive taxes are being wielded to coerce industrial users onto a system that is demonstrably incapable of meeting their needs.

The economic repercussions extend far beyond individual factory bills. Pakistan's textile industry accounts for over 50% of export revenues, sustains millions of direct and indirect jobs, and underpins rural livelihoods through cotton cultivation. A unilateral surge in energy costs will erode global competitiveness, and potentially trigger plant closures or relocation of production to more stable energy markets.

Already, the poorly designed levy on gas-fired captive generation has slashed captive gas demand by 90%, creating a 400 MMCFD RLNG surplus that the government cannot absorb and which worsens circular debt. The same error is now being applied to furnace oil—despite domestic oversupply, demand will collapse once the levy is imposed, forcing HFO to be exported at under Rs 100,000 per ton rather than sold locally at Rs 130,000. As a result, industry will rely on a grid powered largely by imported coal and RLNG, while domestic HFO is sold abroad at a loss. With demand destroyed, the levy will generate no revenue, import costs will rise, and domestic value addition in exports—through the use of local fuels—will decline.

To reverse this trajectory, the government must take three immediate steps. First, suspend the new petroleum and carbon levies on HFO until a comprehensive impact assessment is completed, involving industry stakeholders, DISCO representatives, and energy experts. Such an assessment should quantify the cost differential between captive and grid power under current conditions, and model the long-term effects on export revenue, employment, and foreign exchange earnings.

And even then, any levy should be imposed gradually to allow sufficient time for consumers to adjust. Second, the calculation of the grid transition levy must be corrected to reflect actual grid power tariffs and captive generation costs and eliminate arbitrary inflation. Finally, commit to a multi-year grid-modernization plan that addresses transmission bottlenecks, reduces line losses, and provides reliable power at a regionally competitive rate of 9 cents per kWh or below.

Without these corrective actions, the government risks imposing a de facto production tax on Pakistan's most vital export sector—one that it can ill afford. Coercive levies may fill the treasury in the short term, but they undermine industrial resilience, drive up unemployment, and weaken foreign-exchange reserves through the hollowing-out of export capacity. In effect, policy is being used not to bolster markets, but to strangle them—and in the process, torpedo the very growth narrative that it purports to champion.

A reversal of these levies, accompanied by a clear roadmap for grid improvement, will restore confidence among exporters, stabilize power costs, and ensure that Pakistan's textile sector remains a global competitor rather than a declining casualty of misguided energy policy. ■

Top meeting held to advance energy initiatives

Sindh Energy Minister Syed Nasir Hussain Shah held an important meeting with a senior delegation from Foundation Solar Energy Ltd, a subsidiary of Fauji Foundation, to advance solar energy initiatives across the province. The delegation, led by Major General Amjad Ahmed Butt (Retd) and Brigadier Imran, engaged in in-depth discussions with Energy Secretary Mushtaq Ahmed Soomro, Director Solar Projects Mahfooz Qazi, and other officials from the Sindh Energy Department.

Key topics included the development of large-scale solar parks, micro and mini solar grids, and the solarization of government buildings. Both parties emphasized the urgent need to transition to clean, renewable energy and highlighted the environmental and economic benefits of green power. ■

Barrick, Komatsu ink $440m deal to power Reko Diq mine

EU Report

Barrick Gold Corporation has signed a $440 million deal with Japanese equipment giant Komatsu to supply heavy machinery for the Reko Diq copper-gold project in Balochistan. Under the agreement, Komatsu will deliver a fleet of ultra-class haul trucks, electric rope shovels, excavators and wheel loaders to support mining operations starting in 2026. The deal spans the first five years of operations and is Komatsu's first major equipment deployment in this region. To bolster its support for the venture, Komatsu will establish a dedicated local subsidiary -- Komatsu Pakistan Mining (SMC-Private) Limited -- to provide technical support, training and servicing for the Reko Diq site. Additional investment will also be channelled into Komatsu's regional hub in Dubai to manage logistics and aftermarket services for the expanded equipment footprint.

"The Reko Diq project represents a long-term investment in our future and that of mining in Pakistan, and our partnership with Komatsu is an important part of that vision," said Mark Bristow, Barrick's president and CEO. "We look forward to building on this strong relationship as we develop one of the world's newest greenfield assets.' The equipment to be supplied includes: Komatsu 980E-5 haul trucks from the US; P&H 4100XPC AC electric rope shovels from Milwaukee; Komatsu PC7000-11 mining excavators from Germany; and WE2350-2 electric wheel loaders from Texas. ■

Solar power: Curb the bigger beast of net-metering first

EU Report

News is out that the National Assembly Standing Committee on Finance has unanimously rejected the proposed 18 percent sales tax on the import of solar panels. But does the episode end here — or is it only the beginning?

When the budget was announced earlier this month, the government, under the guise of withdrawing tax exemptions, appeared to go all out in its attempt to impose new taxes. In a press conference, seated alongside Finance Minister Muhammad Aurangzeb, Federal Board of Revenue (FBR) Chairman Rashid Mahmood Langrial sought to justify the proposed sales tax, arguing that it aimed to ensure a level playing field between local solar panel producers and imports.

He further explained that Pakistan is moving toward eliminating tax exemptions — a key requirement of the International Monetary Fund (IMF) program — rather than extending them. On paper, it all made sense. And yet now, there is a reversal. Let's park this U-turn for now. A more pressing issue looms: the glacial pace of reform on net-metering regulations.

Electricity consumption and off-take have declined — a trend driven by high tariffs and the rising adoption of rooftop solar. While the attempt to impose an 18 percent sales tax on imported solar panels may have been directionally correct, it was unlikely to meaningfully slow solar adoption. In 2024 alone, imported solar panels added a cumulative generation capacity of 17 GW — more than one-third of Pakistan's total installed capacity of around 46 GW.

The real policy focus should be net-metering.

What happened to the announcement by the energy minister and the Economic Coordination Committee (ECC) about revising the net-metering buyback rates? That decision stalled at the cabinet level. Why? It's important to examine who remains on the grid. Most are those who cannot afford to solarize their homes. Behind the façade of net-metering lies an inconsistent policy framework increasingly captured by elite interests. The current policy places an undue burden on non-solar consumers, resulting in higher tariffs and undermining the power sector's long-term sustainability.

Net-metering was originally introduced to encourage solar adoption by allowing consumers to sell excess electricity back to the grid at an attractive rate of Rs 27 per unit. On paper, it was a win-win.

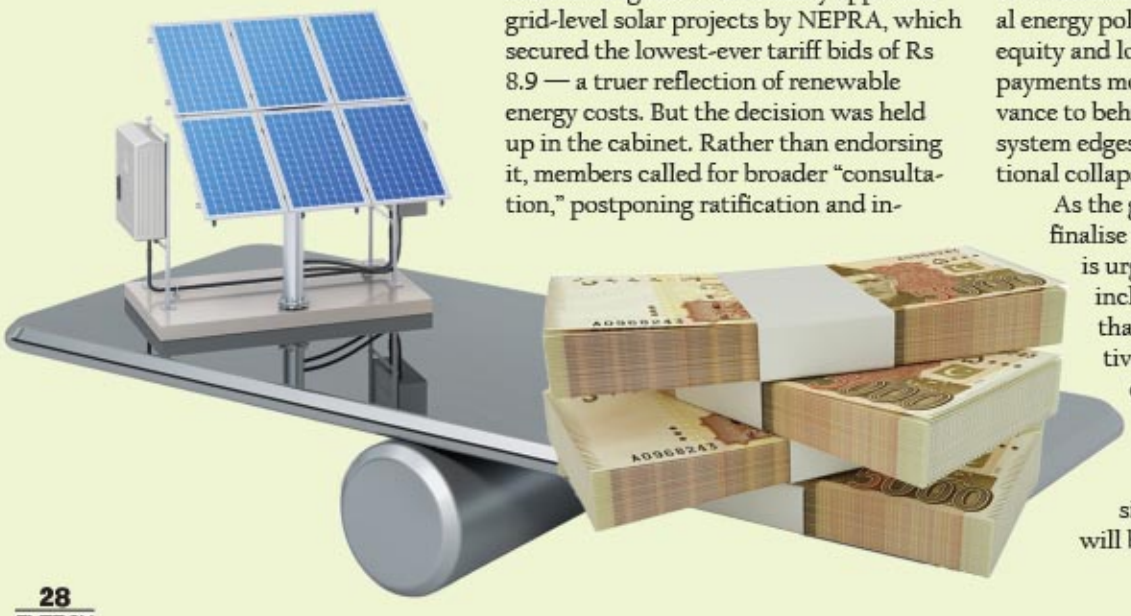
In March 2025, the ECC approved a revised buyback rate of Rs 10 per unit. The decision aligned with recently approved grid-level solar projects by NEPRA, which secured the lowest-ever tariff bids of Rs 8.9 — a truer reflection of renewable energy costs. But the decision was held up in the cabinet. Rather than endorsing it, members called for broader "consultation," postponing ratification and instructing the Power Division to resubmit after further review.

Beyond the buyback rate, the current net-metering framework has other serious flaws. Consumers are allowed to install systems up to 1.5 times their sanctioned load — enabling the installation of excess capacity, which places even more strain on grid users. According to one study, this unregulated rooftop solar boom causes the government to lose Rs 100 billion annually and raises tariffs for grid-connected consumers by Rs 2 per unit. This creates a feedback loop — rising tariffs push more people toward solar, which in turn raises tariffs further — what the Arzachel study accurately calls the "utility death spiral."

Moreover, net-metering is currently only available to consumers with 3-phase meters. Ironically, this excludes much of the lower-income population and prevents solar from being used effectively as a tool to reduce theft and losses in high-loss areas. Pakistan stands at a pivotal juncture in its energy and fiscal policymaking. While solarisation is a vital step toward sustainability and energy independence, the current policy architecture has disproportionately benefitted a small, affluent segment — while the majority bears the rising cost of an increasingly strained grid.

The delay in rationalising the net-metering buyback rate reflects how vested interests continue to shape national energy policy — often at the expense of equity and long-term viability. As capacity payments mount and the grid loses relevance to behind-the-meter generation, the system edges closer to fiscal and operational collapse.

As the government prepares to finalise the Finance Bill 2025, what is urgently needed is a balanced, inclusive energy roadmap — one that moves beyond blunt incentives toward targeted, data-driven mechanisms that reflect real-time grid dynamics and ensure shared benefits. The longer these distortions persist, the deeper the inequities will become. ■



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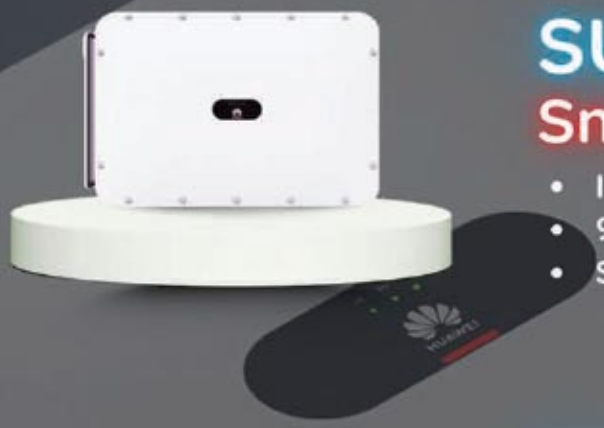

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Pakistan's wind power is going to waste

Contract setup prioritizes fossil fuels over the renewable energy

Amena H Saiyid

Amena H Saiyid is a Washington, D.C.-based correspondent for Cipher. She is a climate and energy journalist with expertise analyzing the regulatory, legal and legislative impacts on the US energy, chemicals and manufacturing sectors

Standing beneath a 300-foot wind turbine, listening to rhythmic whooshes of blades slicing through gusty winds across Pakistan's Sindh Province, it is easy to forget that Zephyr Power's wind farm is just 34 miles from Pakistan's bustling Port Qasim on the Arabian Sea.

Located along the Indus River Delta, Zephyr is one of more than three dozen independent wind farms in Pakistan's Jhimpir-Gharo wind corridor — an arid tract of land 37 miles wide and 113 miles long where wind gusts average about 16 miles per hour.

The turbines in Jhimpir-Gharo now have an installed capacity of 1.8 gigawatts, nearly the size of the Hoover Dam in the United States. Wind provides about 3% of the country's electricity, but in the opinion of developers and analysts, Pakistan is wasting the potential of this clean resource.

To support its fledgling wind industry, Pakistan must upgrade its aging transmission infrastructure, a challenge facing many countries, including the U.S. But in Pakistan's case, wind has the government's support; in the U.S., President Trump actively discourages wind development.

Even the government's backing isn't enough to shore up the wind industry, though. Pakistan's precarious economic situation means the government here is going to have to get creative.

Read Amena Saiyid's first three dispatches from her travels in Pakistan: How solar is transforming the country, where she saw solar being used and the prevalence of cheap Chinese solar panels.

Wind and Sindh

Pakistan came late to the wind-power game. Its first wind farm went up in 2009, three years after the enactment of a law requiring nationwide development of renewable energy. Studies conducted at the time identified the wind corridor between the towns of Jhimpir and Gharo for wind development because the land was mostly desolate and unsuitable for cultivation.

Reaching Zephyr's 50-megawatt wind farm takes nearly two hours driving through Karachi's gritty industrial corridors, over the Sindh Coastal Highway, past tiny ramshackle fishing villages and across the Gharo Creek, where local fishermen sell their fresh catch.

A photo of wind turbines stretching off in the distance along a dusty expanse and under a clear blue sky. Across the arid stretch in southern Sindh in Pakistan, Zephyr Power's 300-foot high wind turbines stand out, Photo by Amena H. Saiyid, April 8 2025.

On the farm, more than two dozen wind turbines are perched on mounds of engineered concrete piles amid muddy flats interspersed with mangroves, crawling with mud crabs, eerily reminiscent of Planet Tatooine in the first Star Wars film. Some of the turbines spin swiftly, while others stand idly by, awaiting their turn.

Over the past three years, Zephyr and Pakistan's other wind farms have had

to curtail nearly half of their turbines' potential electricity generation. But the problem is not the turbine technology; it is the result of slowed national economic activity, complicated by Pakistan's overwhelming power-sector debt, aging infrastructure and the challenges of integrating intermittent renewables into a fragile power grid.

This scenario was not foreseen by developers, investors or the government, said Zephyr's chief executive officer Kumayl Khaleeli.

Lingering slowdown

Pakistan's industrial activity, which drives demand for power, has struggled since the pandemic ended. High electricity rates along with reduced government spending have contributed to the sector's decline, according to the World Bank's latest update.

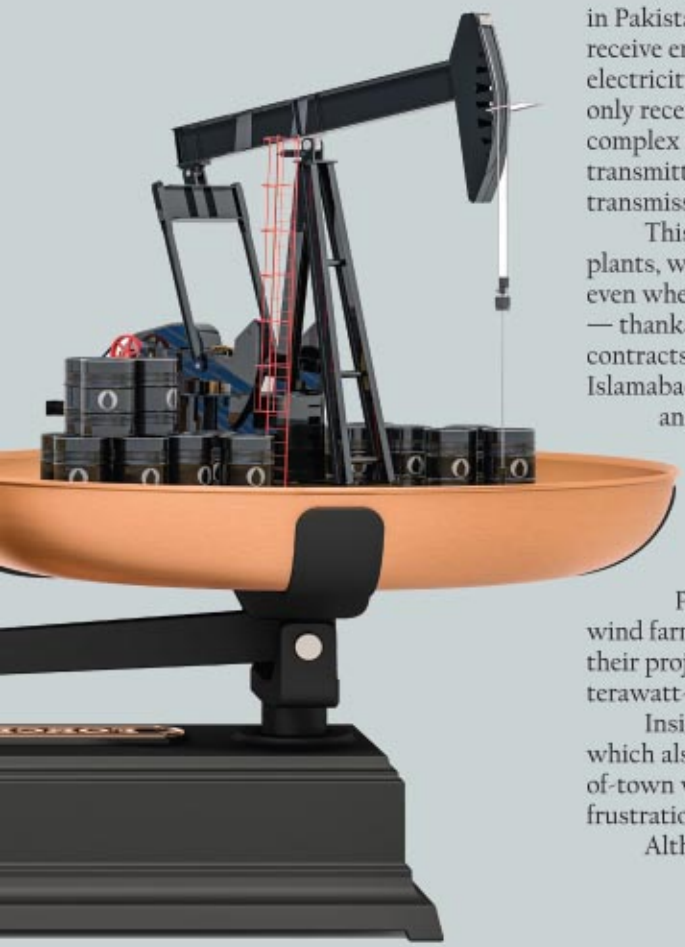
At the same time, Pakistan is struggling to contain its ballooning power-sector debt, which reached $8.63 billion in March. State-run electricity distribution companies are losing revenue for a variety of reasons, including underutilization of power plants and power losses due to aging and inefficient transmission networks or theft.

As a result, the government-run Central Power Purchasing Agency can't always compensate private power-plant producers as required by their purchase agreements — including renewables firms like Zephyr — leaving them short on cash.

Ironically, there's no lack of electricity in Pakistan, which has the capacity to produce it in excess from fossil fuel plants. However, the government is locked into buying electricity from these expensive producers, leading it to curtail activity at cheaper wind farms that carry no such obligations, according to Islamabad-based think tank Renewables First. In addition, the difficulty of managing the variable nature of renewable energy means the grid often relies on always-available fossil fuels, said Khaleeli.

Another issue hurting wind farms in Sindh is that the highest energy demand is further north in Punjab, but transmission bottlenecks and overloaded lines hinder the efficient transfer of power from one region to the other.

The curtailments in wind generation are taking a toll on both Zephyr's bottom line and its turbines. Curtailing requires adjusting the blades so they don't run as efficiently, wearing them down over time.



Zephyr Power's CEO Kumayl Khaleeli discusses the highs and lows of running a wind project in Pakistan. Photo by Amena H. Saiyid, April 8, 2025.

On top of all this, wind projects in Pakistan are contractually bound to receive energy payments for sending electricity to the national grid. But they only receive partial payments, set by a complex formula, if the electricity is not transmitted because of bottlenecks in transmission lines.

This is not the case for fossil fuel plants, which are fully reimbursed — even when they aren't fully utilized — thanks to generous government contracts, explained Asim Javed, an Islamabad-based independent financial and regulatory consultant for the power sector.

In the fiscal year that ended in July 2024 (figures aren't yet available for FY 2025), Pakistan's National Electric Power Regulatory Authority said wind farms dispatched three-fourths of their projected power generation of 5.2 terawatt-hours.

Inside Zephyr's site office in Gharo, which also serves as a guesthouse for out-of-town visitors, Khaleeli expressed his frustration with the ongoing situation.

Although the government eventually compensated Zephyr for more than half of its generation losses from curtailment, Khaleeli is disappointed that he cannot operate his turbines at full capacity during peak wind season, spanning March through September, when most wind plants make 70% of their revenue.

Any day now, the Ministry of Power is expected to announce renegotiated power contracts with several wind companies. The International Finance Corporation, the World Bank's financing arm, warned against such a move earlier this spring, saying it would undermine investor confidence.

Khaleeli too is concerned about the outcome, given the root problems have not been resolved. "Don't expect substantial investments" in the renewable energy sector until the government improves the transmission network and resolves issues around curtailment and energy purchase agreements, he said.

Photo of a field of mangrove trees stretching out to the distance, where they are met by towering wind turbines. Zephyr Power has planted mangroves on its wind farm to shore up the soil and climate-proof the turbines against tidal flows. Photo by Amena H. Saiyid, April 8, 2025.

One obvious solution would be to address the poor transmission system between the south and north, explained Rabia Babar, energy and climate data manager for Renewables First, the Islamabad-based think tank. Indeed, the government is currently trying to resolve right of way issues involved in building a high voltage transmission line between the regions.

Pakistan Power Minister Awais Leghari admits that wind generated in the Sindh corridor is underutilized, but he said adding transmission lines alone will not solve the problem.

"The cost of the transmission is going to add up. That is ultimately going to land on the consumer," Leghari said.

He offered another potential solution: adding battery storage systems that could better utilize wind power's full potential. He noted that the World Bank and the Asian Development Bank are helping Pakistan finance utility-scale battery storage systems in at least two locations, including Jhimpir. But Leghari said he has an even bigger idea, which is to privatize the power sector like it is in the U.S. and parts of Europe — meaning the government is "not going to be the buyer of power anymore." ■

Pakistan faces existential threat from water crisis

Shahbaz Khan

The writer is a petroleum engineer and an oil and gas management professional

Water shortage is now posing an existential threat to Pakistan in multiple dimensions. The widespread protests we observed in Sindh a few weeks back regarding six canals are just one example. The more serious dimension of the issue can be observed by Pakistan's unequivocal declaration that India's implementation of its recent absolutely illegal intimation of putting the Indus Waters treaty in abeyance would be considered as an act of war.

Both the above reactions make complete sense, when we realise that per capita freshwater availability in Pakistan has declined from 5,260 cubic metres in 1951 to around 900 cubic metres and is projected to decrease to 560 cubic metres by 2050.

What further accentuates its significance is the fact that, while the global average for the annual utilisation of freshwater is 70% for agriculture, though for Europe it is only 40%, in Pakistan it is 93%. The disproportionate consumption reflects nothing else except wastage. Also, its alarmingly diminishing availability for the industry can prove to be the biggest choke-point for industrial growth.

Agricultural use

While rising ambient has increased water evaporation and transpiration, our cropping strategy has proven to be a more potent culprit. Sugarcane and cotton alone account for at least one-third of the aggregate consumption by the agricultural sector. What adds to the injury is that Pakistan's crop water productivity for sugarcane is around 53.5% lower than the global average. For rice, with one-third of the global average, it is even worse.

Irrigated agriculture, which is generally considered to be a luxury vis-a-vis rain-fed farming, provides 90% of Pakistan's food, while the global average is 40%. Despite the operational convenience it provides, we have failed to utilise it effectively so far. Irrigation system in Pakistan, rather, is a major source of wastage. Some 25% of water is lost till the farm gate, followed by the loss of 30% of the remaining water till its application at the crop root.

The ingress of poor farming practices is so pervasive that it has left no aspect unaffected. For instance, almost half of upper Sindh's irrigated land is now affected with water logging and salinity. While the increase in ambient is aggravating the issue of salinity, seepage from unlined watercourses and cultivation through water inundation keep on making more land hostage to water-logging.

In my view, the current system of billing the water use in agriculture, called Abiana system, majorly contributes to the above rampant utter extravagance of water. Instead of per unit usage, it is based on the area being cultivated, thus providing least incentive for the user to save it. Also, the state succeeds in recovering only a fraction of what is billed. Thus, what is ultimately collected barely covers 10% of the maintenance costs for water channels.

The "water use efficiency", ie, the value created in USD/cubic metres of water used, is the most common yardstick for assessing a country's performance regarding its water economy. As per the UN records, for Pakistan, China, Israel and India, its overall value, respectively, stands at 1.84, 31.21, 128.94 and 3.13, while for agriculture for the same countries in the same order, it stands at 0.40, 2.51, 2.06 and 0.49. For Switzerland, the overall value is 432 and for agriculture it is 5.95.

Industrial use

Rapid urbanisation is increasing the per capita demand for freshwater while increasing urban waste continues to pollute it. As a result, the size of the global water and wastewater treatment market is expected to reach twice of its current size of $350 billion by 2034; a reflection of the growth of circular economies.

In Pakistan, we have so far not observed any such signs. This is despite the fact that out of the total industrial consumption, 49% goes to the textile sector and only few textile manufacturers treat their effluent before dumping it. In Faisalabad, the textile hub of the country, around 3.6 million cubic metres of effluent water is disposed of without treatment into Chenab and Ravi.

What is to be done

From the above observations and analysis, we can observe similar disregard for the real economic value of this natural resource, as we adopted for decades towards natural gas till we had frittered away most of its proven reserves.

The crisis of water is definitely more fundamental. In view of the same, the following steps seem essential: 1) Uninterrupted flow of water, in line with the Indus Waters Treaty, from India to Pakistan can only be ensured through effective diplomacy. This would, however, remain unsustainable, if not complemented with bilateral trade and economic relations with India and other critical countries capable of leveraging their influence in Pakistan's favour when required. The same, in turn, requires industrial development for generating value-added products for exports. 2) Kabul River contributes tangibly to the economy of K-P. Thus, to ensure a sustained and judicious use of its water, a treaty with Afghanistan needs to be initiated. 3) The present unit cost of $0.08/cubic metres of water for the textile sector is the lowest in the region; thereby, generating an attitude of indifference towards its wastage.

SOLAR ENERGY FUTURE

Solar to become second largest source of power generation

Net metering will contribute 18pc to national grid

Fawad Yousafzal

The solar will become Pakistan's second largest source of power generation by June 2026, following the hydropower, and will produce 8,444MW or 19 per cent of the total electricity.

The solar net metering will contribute 7,794MW (or 18pc) to the national grid, while generation from the solar sources(other than net-metering) will reach 650MW by June 2026, official data revealed.

A total of 2,800 MW is expected to be added to the national grid, including a major contribution of 2,633MW from solar net metering, during the upcoming FY2025–26, the Annual Plan 2025-26 projected.

The new additions will raise the cumulative installed generation capacity to 44,626 MW by June 2026. The generation mix is projected to comprise approximately 50.5 per cent from renewable sources (including hydel, solar, solar net-metering, wind, and bagasse) and 49.5 per cent from thermal sources (including coal, gas, RLNG, oil, and nuclear) by the end of upcoming fiscal year.

As per the Annual Plan, 135MW new hydropower capacity will be added to the system in FY2025-26, which will take the total installed capacity to 11,853 MW or 27 per cent of the installed capacity.

The coal will emerge as the third largest contributor to the national grid and provide 7920MW or 17 per cent electricity, which includes 4620MW (10pc) from imported coal, while 3,300MW (7 pc) from the local coal.

The generation from RLNG will be 6493MW (15pc), nuclear 3,545MW (8pc), gas 2,776MW, and oil 1,351MW in the FY2025- 26. New bagasse based capacity of 32MW will be added to the national grid during the upcoming FY, taking the total installed capacity from the source to 399MW, the data maintained.

Talking about the ongoing fiscal year, the data revealed that by the end of ongoing FY2024-25, the total installed power generation capacity stood at 41,938 MW (excluding 3,709MW from the KElectric system). During FY2024–25, a total of 4,625 MW of installed capacity, comprising residual fuel oil (RFO), regasified liquefied natural gas (RLNG), and gasbased power plants, was retired, reflecting Pakistan's commitment to phasing out fossil fuel–based generation and accelerating the clean energy transition. Concurrently, a total of 4,513MW of new capacity was added to the system, predominantly from renewable energy sources.

This includes 2,813MW from net metering and 1,038MW from hydropower projects. However, the overall impact of these additions was largely neutralized by the corresponding retirements, resulting in a net decrease of 112MW in the total installed generation capacity. ■

HUAWEI

Powering Pakistani Homes

Huawei Launches New Residential Hybrid System to Deliver Smart Energy Solutions

EU Report

Huawei Digital Power Pakistan has officially launched its latest Residential Hybrid Energy System, unveiled during the exclusive event "Huawei Powering Pakistan – Advancing Energy Through Innovation" held at the PC Marquee, Karachi. This cutting-edge solution is designed to empower Pakistani households with cleaner, smarter, and more reliable energy — especially vital in a landscape of rising costs and frequent power outages.

Next-Generation Solar for Every Home

The newly launched system combines state-of-the-art technologies to offer homeowners full energy control, savings, and security. Key components include: Huawei Hybrid Inverters (SUN2000-5-12K-MAP0 and SUN2000-12-25K-MB0) – convert solar energy for home use while managing intelligent battery backup LUNA2000 Lithium-ion Battery Packs (7/14/21kWh) – store excess solar power for night-time use or during grid failures. SmartGuard Safety Device – monitors energy flow and enhances protection for home systems.

Benefits for Families Across Pakistan

Whether in urban centers or rural communities, Pakistani households can now benefit from:

- Uninterrupted power during load shedding

- Lower monthly electricity bills through solar offsetting
- Real-time energy monitoring via smart apps
- Long-lasting safety with lithium batteries and intelligent system control

This solution represents a major step toward energy independence for families, offering them the tools to reduce reliance on the grid and transition toward sustainable living. Empowering Installers: Rewards Program Launched Nationwide

In addition to the product launch, Huawei also introduced its Installers Rewards Program in Pakistan — a new initiative to incentivize and support certified solar installers. Now, professionals can earn points and redeem rewards based on completed residential installations. "Excited to be part of Huawei Digital Power Pakistan's mission to transform the energy landscape of our country! We're helping homes take control of their energy future with our latest Residential Hybrid Solar Solutions — featuring the powerful SUN2000 hybrid inverters and LUNA2000 battery systems," JinYu - Managing Director Digital Power Pakistan shared during the event.

"And through our new Installers Rewards Program, we're empowering the professionals making solar adoption possible at every level."

Commitment to a Smarter, Greener Pakistan

Huawei reaffirmed its vision of "Building a fully connected, intelligent Pakistan" — starting with energy solutions designed to address real-world challenges in homes, cities, and villages. With localized support, innovative digital tools, and long-term partnerships, the company is laying the foundation for a smarter energy future across the country. ■

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PAKISTAN GENERATES 3.9M TONS OF PLASTIC WASTE ANNUALLY

CAN PAKISTAN'S PLASTIC WASTE REALLY STACK UP TO TWICE THE HEIGHT OF THE K2

Ebadat Ur Rehman Babar

The writer is a Sustainability Consultant and a Research Associate at the Sustainable Development Policy Institute SDPI

Can Pakistan's plastic waste really stack up to twice the height of the K2? That's the claim made in "Rethinking Pakistan's Relationship with Plastics1"report by the UNDP Innovation Accelerator Lab (2021). The report states that Pakistan generates 3.9 million tons of plastic waste annually, enough, it says, to form a pile 16,500 meters high, or twice the height of the K2, the second highest mountain on Earth.

As a researcher committed to scientific integrity, I decided to test this striking metaphor using basic volumetric analysis.

Let's start with the numbers. The average density of mixed plastic waste is approximately 900 kilograms per cubic meter. Using the basic formula for volume (Volume = Mass ÷ Density), we can estimate the total space this waste would occupy. For example, 3.3 million tons of plastic waste, equivalent to 3.3 billion kilograms, would occupy about 3.67 million cubic meters.

Now, imagine stacking this volume vertically on a square base measuring 100 meters by 100 meters, roughly the size of a city block. Using simple math (Height = Volume ÷ Area), the UNDP estimate would produce a plastic tower about 367 meters high. Even with this higher UNDP estimate, the pile wouldn't reach even 5% of K2's height of 8,611 meters, let alone the 16,500 meters claimed. If we instead use the more recent 2-million-ton estimate from the SWITCH-Asia "Plastic Policies in Pakistan (2025) report", it will take up approximately 2.22 million cubic meters and the pile shrinks further to just 222 meters in height.2

For perspective, even if we consider K2's topographic prominence, how much it rises above its immediate surroundings, which is 4,017 meters3, the plastic stack

will still fall drastically short. In fact, you'd need nearly 18 towers of the 222-meter kind stacked on top of one another just to match K2's rise above its local terrain.

While such vivid analogies may be intended to raise public awareness, they can often backfire. Exaggerated statistics presented without clear methodology risk undermining public trust and fuellingscepticism, even when the underlying concern is valid. For a country like Pakistan, whose global image is already challenged by environmental and developmental narratives, maintaining credibility is crucial. Overstated claims, no matter how well-intentioned, can weaken the impact of both research and advocacy efforts, making it harder to engage policymakers, investors, and the public in meaningful action.

Environmental communication must therefore strike a careful balance between urgency and accuracy. The real crisis is not just the sheer volume of plastic waste but the systemic failure to manage and recycle it effectively. According to the SWITCH-Asia 2025 report, only 3% of Pakistan's plastic waste is currently recycled, highlighting a profound gap in sustainable waste management systems. This sobering fact, more than any metaphorical "plastic mountain," should guide our efforts to address the country's environmental challenges and improve its standing on the world stage.

No matter whether Pakistan produces 2 million or 3.9 million tons of plastic waste yearly, it is obvious that proactive action is needed. Based on World Economic Forum, 70 percent of this waste is not handled properly4 that lead to pollution in rivers such as the Indus and burning of plastics also causes air pollution risking the health of people.

What makes the crisis serious is the excess waste as well as the lacking management capabilities. Cities such as Karachi create a lot of waste and it exceeds the ability of current collection and recycling systems. The main sources are open dumps and informal recycling which increase the risk to both the environment and health.5 Such waste mismanagement also brings in major economic costs. In regions where tourism matters such as Azad Kashmir, pollution from plastic waste makes visiting less attractive, putting local jobs and important services at risk.6

Although laws banning single-use plastics have been introduced, enforcement is poor, and they do not have much impact because they are not consistently followed and monitored.7 Efforts to control plastic waste in Pakistan must involve multiple sectors collaboration. Precise waste collection and processing can be promoted with Public-Private Partnerships. Helping the informal waste sector grow through recognized cooperatives and official dealings with cities will support both good working conditions and higher recycling rates. It is important for the government to put in place a National EPR Framework, including setting achievable recycling targets to make manufacturers responsible for all core aspects of their products.

Furthermore, people should be educated to reduce waste and dispose of it correctly by launching targeted campaigns. By joining waste sorting efforts, communities can take control of how their environment is managed. Additionally, SMEs play a key role in providing recycling services at the local level and can help with pioneering ideas for bigger impact.

Still, to be effective, action should rely on reliable data, not on feelings or hype. A transparent and regularly updated national database is needed immediately in Pakistan to properly monitor the amount of plastic waste produced, processed and recycled. Without consistent and accurate information, policies risk falling short or, worse, diverting focus from the systemic solutions that are truly essential. For citizens, businesses, and policymakers to engage meaningfully with the plastic crisis, our starting point must be facts, not exaggerations. The mountain we face is real, but its height is measured not in meters, but in missed opportunities for sustainable change. ■

Turning Sunshine into Power

Rooftop Solar Revolution Seen in Islamabad

EU Report

In Islamabad's bustling neighborhoods, rooftops are no longer just shelters—they're becoming power stations. As electricity prices soar and energy demand climbs, homeowners are turning to solar solutions to secure their futures. Two distinct residential projects in the capital illustrate how solar technology is reshaping lives, blending financial gains with environmental stewardship—with one standing out for Growatt's home solar energy solution.

A 15kW grid-tied solar project in DHA Islamabad's upscale enclave redefines simplicity and performance with Growatt's MOD 15KTL3-X inverter. This high-efficiency powerhouse combines user-friendly design with robust engineering. Its 98.6% maximum efficiency and dual MPPT trackers ensure every ray of sunlight is optimized. Homeowners also benefit from the inverter's touch-sensitive keys and OLED display, offering real-time insights into energy production and system health. Additionally, safety is paramount: the inverter's Type II SPD protection on both AC and DC sides shields against voltage surges and lightning strikes, while the optional AFCI function prevents arc faults—a critical safeguard in residential settings. Generating 21,600 kWh annually, this rooftop system covers household needs while exporting surplus power at 72 PKR/kWh for PKR 1.56 million in annual revenue. Completed in 2023 at a cost of PKR 2.9 million, its rapid payback period has sparked a neighborhood-wide shift to solar.

Another 10kW hybrid solar system launched in late 2024 in a residential area of Islamabad exemplifies the marriage of innovation and practicality. At its heart lies Growatt's SPH 10000TL-HU inverter, designed for hybrid energy management. It seamlessly integrates solar power, battery storage, grid and diesel and gas generator connectivity. The inverter's built-in UPS function ensures uninterrupted power during outages with a lightning-fast 10ms transition—critical in a city where blackouts are frequent. By generating 14,400 kWh annually, the household slashes grid reliance while earning PKR 610,400 per year by selling surplus energy at 42 PKR/kWh. The inverter's scalable design allows future expansion, whether adding more panels or upgrading to lead-acid or lithium batteries, ensuring the system evolves with the family's needs.

What unites these projects is Growatt's commitment to versatility and reliability. The SPH 10000TL-HU and MOD 15KTL3-X inverters aren't just hardware—they're gateways to energy independence. In Islamabad, solar is no longer a luxury—it's a necessity. Whether through smart hybrid systems or high-yield grid-tied setups, the benefits are clear: lower costs, energy security, and a greener footprint. By choosing Growatt, residents aren't just installing panels—they're investing in technology that adapts, endures, and empowers. ■

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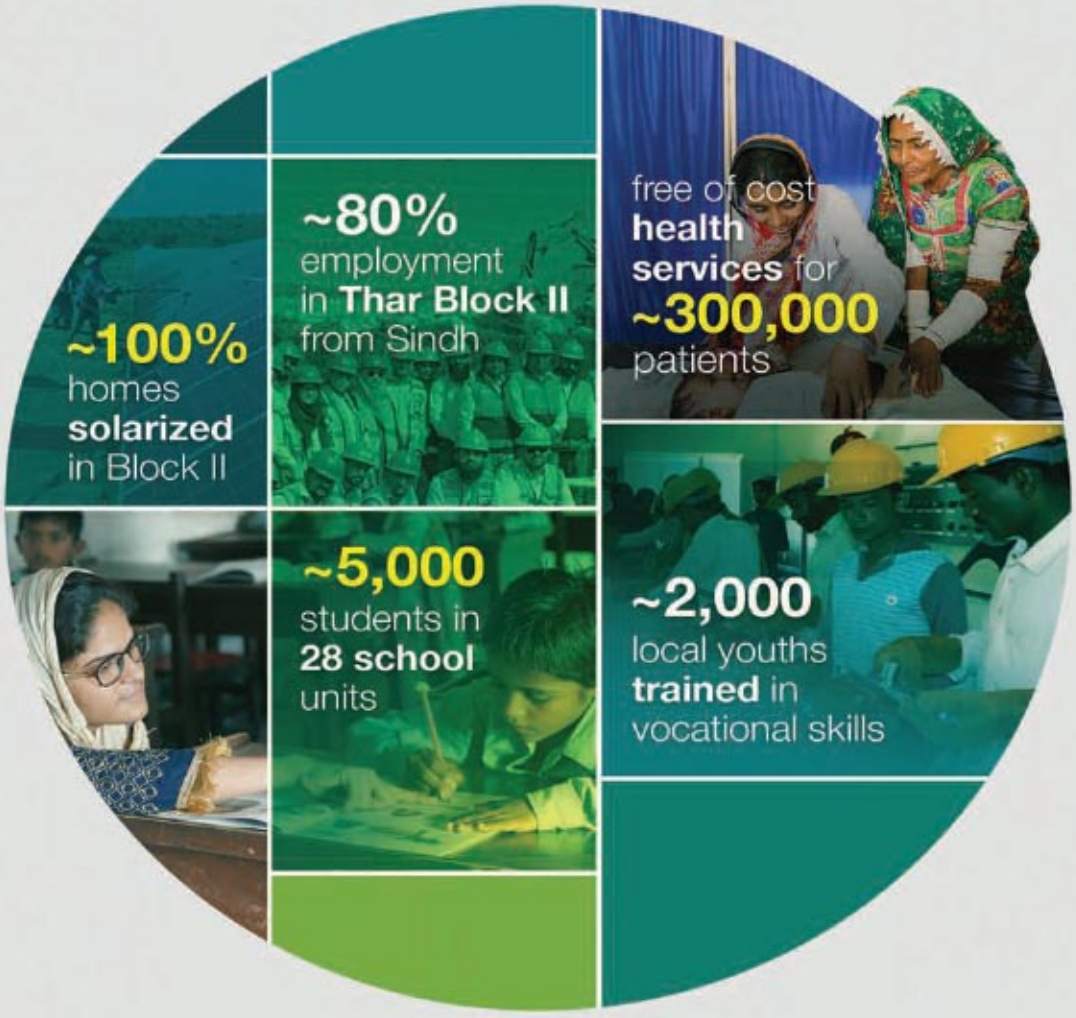
Thar Foundation, the CSR wing of Block II entities is collaborating with its partners to drive impactful initiatives that are transforming lives in Thar. The Foundation remains committed to providing healthcare, education and employment opportunities to thousands, ensuring inclusivity and growth.



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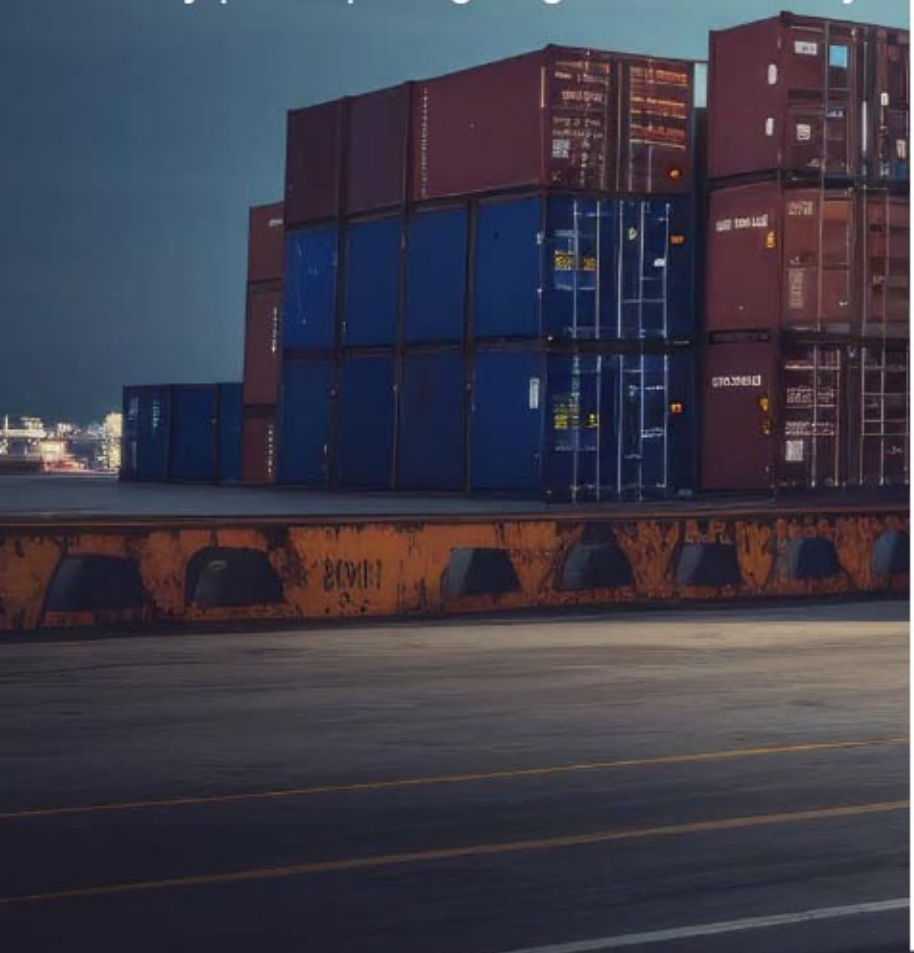
Tariffs & export expansion

No country has achieved prosperity by relying solely on its domestic markets; China has become the top exporting nation; India and Bangladesh have also progressed by participating in global economy



Ishrat Husain

The writer is a former governor of the State Bank of Pakistan

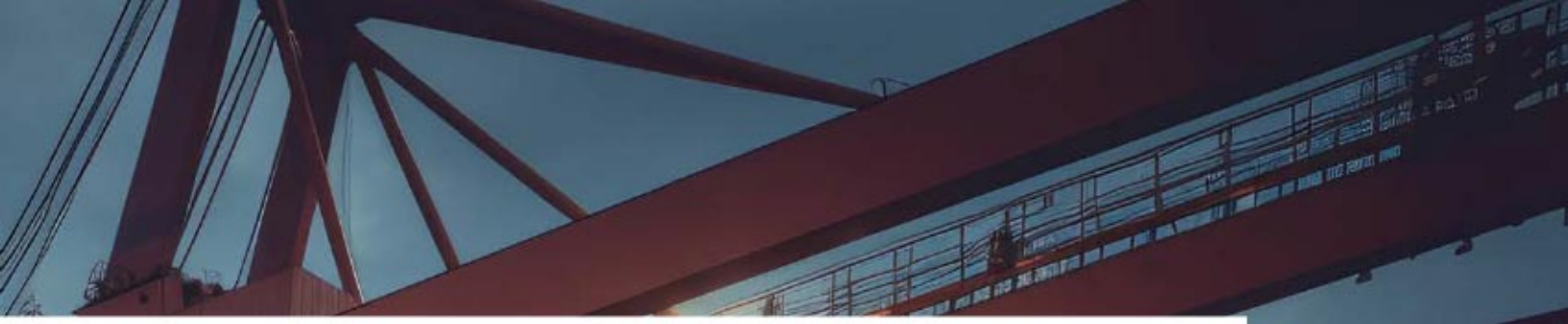
No country has achieved prosperity by relying solely on its domestic markets. The spectacular success of China, despite having a large market of 1.4 billion people, is primarily attributed to its integration into the world economy. In merely three decades, China has become the top exporting nation.

Notably, our neighbours India and Bangladesh have also progressed since 1990 by actively participating in the global economy. Vietnam, once a war-shattered country with a lower export level than Pakistan until 1996, exported $371bn of goods, equal to 106 per cent of GDP, in 2022, while Pakistan hardly reached $30bn, or 8pc.

Had Pakistan retained its share in the 1990s' global exports of 0.15pc, it could have generated $50bn by 2024-25. Unfortunately, our global share has slid to an average of 0.08pc in the 2020s. Export earnings of $50bn would have prevented recurring crises and reliance on external borrowing, preserving economic sovereignty.

All major political parties seem to agree that Pakistan must recapture its lost market share and reduce its dependence on external borrowing. This implies surpassing other countries in pricing, quality, reliability, and the timely delivery of goods and services. Regaining its market share would enable accelerated economic growth and jobs for the youth as well as act as a buffer against external shocks. The recent debate in parliament focused on how tariff rationalisation can achieve the export expansion target. One cannot expect a single instrument such as tariff rationalisation alone to deliver the desired results; the matter must be seen in the larger context of enhanced competitiveness. It should be conceded that there will be losers and winners and that some industries won't survive while new ones would emerge.

The challenge of improving competitiveness is intricate, as states do not directly compete. Rather, it is the myriad firms, enterprises, and companies within them that compete under a national policy and institutional framework. Hence, a comprehensive analysis of competitiveness means a two-layered approach — at the national and firm level.



A conducive national environment entails well-functioning governance institutions, streamlined investment climate, emphasis on human capital, especially female labour participation, rationalised tariffs and taxes, flexible exchange rate policy and policies for the promotion of exports. At the firm level, investments in upskilling the workforce, professionalised management structures, collaboration with international experts, engagement in joint ventures with foreign companies, participation in global value chains, service exports, innovation, and digitalisation are imperative.

We can't expect a single instrument such as tariff rationalisation alone to deliver the results.

With tariff reform planned over the next five years, some complementary changes are needed. First, overregulation and high entry barriers disadvantage firms in the formal sector, with only 5pc of businesses accounting for 76pc of exports. Regulatory reforms have been underway for the last five years and should be brought to a culmination point. By eliminating outdated rules, streamlining processes in land acquisition and SEZs, and providing access to finance, a conducive environment is created for new entrants. Persisting difficulties in navigating bureaucracy and securing approvals hinder business growth and innovation. Facilitating ease of entry and exit is crucial to break rent-seeking practices, promote efficiency and encourage new ventures.

Second, dedicated commercial courts and alternative dispute resolution mechanisms should be set up to enforce contracts speedily and avoid protracted litigation which acts as a barrier, keeping resources trapped in low-productivity firms. Third, energy prices should be determined in a competitive market consisting of multiple buyers and sellers without intervention by the regulator or government.

Fourth, the Export Facilitation Scheme and Export Development Fund should be aligned with international best practices and the excessive tax burden on the export sector eliminated.

Fifth, proliferating new technologies have spurred advanced production and processing methods, elevating the need for knowledge-based skilled workers. Platform economies, encompassing online sales, technology frameworks, and transaction platforms are gaining traction. Public-private partnership in resolving skill shortages must be incentivised.

Finally, tariff rationalisation. Our highly protected economy relies heavily on high output tariffs, a significant source of rents for shielded firms. Profitability for sectors with strong trade protection is more than double that of other industries, leading to pressure from political and business lobbies to maintain high tariffs. While economists agree on time-bound, performance-related protection for infant industries, Pakistan continuously extends concessions and high tariff rates, resulting in low entry and exit rates for exporting firms, reduced product diversification, unchanged sectoral composition since the 1990s, and heightened geographical concentration.

Though the latest estimates of effective rates of protection are unavailable, a previous PIDE study suggested a decline in the early 2000s. However, introduction of additional customs and regulatory duties in the last five years has increased ERPs, with the average rate rising from 12pc in FY15 to almost 20pc in FY20 — double that of our competitors' and China's 5pc. In a world dominated by global value chains, tariffs on imports of components, ancillary supplies and intermediate inputs act as a tax on exports. Reducing import duties helps minimise input costs, enabling downstream industries — automobiles, construction, consumer electronics, engineering goods — to become competitive in third-country markets. Despite protection, auto-grade steel isn't domestically produced, hindering the fabrication of certain auto parts. Similarly, pharma faces challenges as active ingredients are imported. High tariff rates impede industries in sunrise sectors from scaling up, reducing unit costs and becoming competitive globally. In fast-moving market dynamics, static input-output coefficients lose relevance.

Meanwhile, the private sector needs a radical mindset shift. While blaming the government is often justifiable, owners must reconsider their own attitude towards workers and recognise them as key partners, invest in R&D, and explore new markets. Professionalising the management cadre, utilising management consultancy and adopting international benchmarks and best practices are additional enablers.

As these targets and action plans evolve, maintaining consistency, continuity, coherence, coordination and predictability is paramount. To that extent, open debate and discussion in parliament signals that these reforms, once agreed upon, will not be abdicated if a new political party comes to power in 2029. ■

Carbon Credits Farming to Direct Air Carbon Vehicles

Investing in CO_2 based industrial production, Pakistan can position itself as a leader in carbon trading

Dr Ehsan Ali

Individual Consultant Climate Change
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Carbon credit trading has emerged as a profitable global opportunity, where the main raw material known as carbon dioxide (CO_2) is freely available in the atmosphere. Without any direct cost, this greenhouse gas can be captured and used to generate income through carbon credits, while also supporting sustainable farming and development. Apart from farming, CO_2 can also be used to produce valuable industrial products, positively contributing to the country's development index. This article explores the importance of carbon credit farming, its benefits, and its potential for Pakistan.

The adverse impacts of climate change have increased global efforts to reduce CO_2 emissions. In the 19th century, people began speaking openly about pollution, and emissions from burning coal and other fossil fuels were declared harmful to the environment. Many pollutants were studied and found dangerous due to their greenhouse effect, which causes global warming. Today, the world is united under the UN Framework Convention on Climate Change (UNFCCC) to reduce emissions and limit global warming. Many serious effects of climate change have already been observed and are seen as major threats to life on Earth if not addressed in time.

Carbon credits have been introduced as a way to reduce or avoid greenhouse gas emissions by adopting recommended farming methods and other carbon capturing or emission reducing technologies. A carbon credit is a permit that allows a company or person to release a certain amount of greenhouse gases into the air. These credits can be bought and sold. Some companies, like airlines, steel, and cement industries, find it hard or impossible to completely avoid emissions. To deal with

this, they can buy carbon credits to make up for the pollution they still produce. Pakistan, like many other developing countries, has great potential to benefit from carbon credit trading. However, the process requires understanding technical methods and registering with recognized carbon markets.

A lot of useful information about carbon credit trading can be found on the website of the Ministry of Climate Change and Environmental Coordination, Pakistan, under the Pakistan Policy Guidelines (2024) for Trading in Carbon Markets. Article 6 of the Paris Agreement allows countries and companies to trade carbon credits to facilitate them meeting their climate goals in a transparent and fair way. It enables the exchange of carbon credits between countries, companies, or through government-led systems. The goal is to support sustainable development while offering flexible and potentially beneficial opportunities for stakeholders involved in reducing emissions.

Sindh Forest Department has successfully sold carbon credits through its Delta Blue Carbon (DBC-1 and DBC-2) projects, which focus on mangrove restoration in the Indus Delta. This initiative serves as a model for future Blue Carbon Climate Mitigation Projects.

Similarly, the Punjab Saaf Pani Company is pursuing a multimillion dollar claim in carbon credits for reducing emissions through its water filtration initiative. Another noteworthy example is the Kenya Agricultural Carbon Project (KACP) registered with Verra (Verified Carbon Standards), where 30,000 small scale land farmers adopted sustainable farming practices under one umbrella. This not only increased crop yields and income, including earnings from carbon credits, but also contributed to reducing global emissions.

Capturing one metric ton of CO_2 equals one carbon credit, currently valued at around 20 to 30 USD. Conventional crops can capture 2 to 4 metric tons of CO_2 per acre annually, letting a 100 acre farm to earn in average around 3000 to 7,000 USD per year in carbon credits approximately. Agroforestry can increase this potential, capturing 4 to 10 metric tons per acre per year.

Beyond farming, biomass to energy technologies like biogas and biomass gasification should be promoted at both household and industrial levels to reduce emissions and earn carbon credits. Pakistan has already documented large scale biomass availability in the Biomass Atlas of Pakistan, developed with support from the World Bank.

The final report is available on the World Bank website. In addition, industries worldwide are shifting towards producing CO_2-based products, which both reduce emissions and generate carbon credits. For example, PetroVietnam Fertilizer and Chemicals Corporation (PVFCCo) is building a facility to capture 240 tons of CO_2 per day for environmentally friendly urea production. Pardis Petrochemical Company in Iran is developing a plant to capture and use 800,000 tons of CO_2 per year for the same purpose. CO_2 is also being used to produce a wide range of items, including methanol, methane, formic acid, concrete polymers, fabrics, aviation fuels, and chemicals.

Carbon credit farming is a unique opportunity for Pakistan to align with international goals while boosting its economy. By adopting sustainable farming practices and investing in CO_2 based industrial production, Pakistan can position itself as a leader in carbon trading. ■

Beyond ten billion trees

Programme contributes to biodiversity conservation

Barrister Dr Mohd Ali Saif

The writer is the information adviser to the chief minister of Khyber Pakhtunkhwa

In a pioneering effort to combat climate change, preserve biodiversity and improve livelihoods, the Khyber Pakhtunkhwa government has emerged as a key player in Pakistan's green transformation. Through an array of ground-breaking initiatives, including the successful completion of the Billion Tree Afforestation Project, significant contributions to the national 10 Billion Tree Tsunami Programme (10BTTP) and several complementary environmental projects, the KP government is spearheading a large-scale ecological revival while simultaneously empowering communities across the province.

Building on the success of the Billion Tree Afforestation Project (BTAP) in KP, the 10 Billion Tree Tsunami Project (10BTTP) was launched in 2019 as a national flagship initiative focused on restoring degraded forest ecosystems and enhancing forest cover. The programme has yielded impressive outcomes including reforestation on 68,000 hectares, establishing 6,130 assisted natural regeneration sites, and direct sowing over 7,185 hectares. Soil conservation interventions span 2,728 hectares, and over 152 million free seedlings have been distributed to encourage private planting.

The 10BTTP builds upon the impressive legacy of its predecessor, the Billion Tree Afforestation Project (BTAP), whose impacts extended far beyond increasing forest cover. By creating over 13,000 private nurseries and engaging rural communities, particularly women and youth, the BTAP has generated thousands of green jobs. Local incomes have grown, skills have improved, and environmental awareness has deepened.

These public-private partnerships have become a cornerstone of KP's reforestation success, linking ecological restoration with economic opportunity. BTAP successfully restored and replanted trees over 350,000 hectares of degraded forest landscapes, surpassing its Bonn Challenge commitment. This large-scale afforestation has contributed to carbon sequestration, improved biodiversity, and reinforced riparian embankments in critical catchment areas like the Indus, Kunhar and Swat rivers.

In recognition of these achievements, Inger Andersen, then director-general of the International Union for Conservation of Nature (IUCN), remarked in 2017: "IUCN congratulates the province of Khyber Pakhtunkhwa on reaching this momentous milestone. The BTAP initiative is a true conservation success story, one that further demonstrates Pakistan's leadership role in the international restoration effort and continued commitment to the Bonn Challenge."

One striking example of environmental transformation is Heroshah in Malakand, where barren hills have been turned into lush forests. In 2015–16,

around 16,000 labourers reforested over 800 hectares, improving the area's natural beauty, controlling erosion, reducing flood risks, increasing rainfall and offering economic benefits by reducing dependence on firewood.

Innovation lies at the heart of KP's green strategy. The Forest Department has set up Forest Knowledge Parks in southern districts – hubs that combine conservation, education and income generation. These parks have delivered concrete results: 85 hectares of soil conservation, 40 hectares of sowing, 200 cubic meters of gabion structures, and 11 kilometres of avenue plantations. They also feature demonstration orchards, cactus gardens, and Non-Timber Forest Product plots across eight hectares.

Livelihood initiatives include 50 beehives, 26,000 fish farming units and wildlife enclosures, promoting biodiversity and sustainable income. Other features include bird aviaries, a greenhouse, a digital weather station and four kilometres of live hedge fencing.

Since its inception, the project has achieved plantation on 1,888 hectares, developed 5.12 hectares of nurseries, and procured 775,000 plants. Dry afforestation through trenches and hillside ditches has been carried out on 55 hectares, alongside 15 hectares of stream bank stabilisation and 428 cubic meters of gabion structures. Avenue plantations span 114 km, while 297 hectares have been managed under rotational grazing. Additional interventions include the creation of water ponds, constructing sheds and salting points, land acquisitions, establishing check posts, and comprehensive baseline surveys. These efforts contribute significantly to ecosystem restoration and socio-economic uplift in the merged areas.

Meanwhile, the Forest Department continues its commitment to long-term sustainability with its Forest Knowledge Parks and Ten Billion Trees Afforestation Project, both of which aim to scale up forest-based solutions to climate and livelihood challenges. These projects also strengthen institutional capacity and foster partnerships with civil society and educational institutions to promote a culture of environmental stewardship. With an investment of over Rs27.6 billion in the 10BTTP alone and timelines stretching to 2028, Khyber Pakhtunkhwa is positioning itself as a model for climate resilience and sustainable forestry in Pakistan.

As climate change accelerates and environmental degradation poses growing threats, the Khyber Pakhtunkhwa government's multifaceted initiatives stand as a testament to the power of strategic planning, community engagement, and unwavering commitment to a greener future. ■

SNGPL to face inquiry on subsidiary issue

Khalid Mustafa

Since Sui Northern Gas Pipelines Limited (SNGPL) cannot form a subsidiary without government approval, an inquiry will be launched into the matter, said Federal Minister for Petroleum and Natural Resources Ali Pervaiz Malik.

The state-owned SNGPL has created a subsidiary to be used as a third party for getting gas from Exploration and Production (E&P) companies under the amended Exploration & Production Policy 2012.

The creation of moresubsidiaries by SNGPL and SSGCL has irritated the federal government, and to this effect when this scribe contacted Federal Minister for Petroleum and Natural Resources Ali Pervaiz Malik shortly before the ECC meeting, he responded: "Yes, I have taken notice of this issue and I am going to initiate an inquiry as SNGPL cannot create a subsidiary without getting government approval."

Under the amended E&P policy approved by ECNEC, E&P companies were allowed to sell 35 percent gas from new gas discoveries to third party -- private sector companies -- at the auctioned prices after getting bids, and 65 percent gas will be allocated to the Sui companies at existing well-head gas prices.

The minister also raised eyebrows at another subsidiary -- Alternate Energy Pvt Limited of Sui Southern. Alternate Energy Pvt Limited also gave an advertisement in the national newspapers seeking bids for LNG and natural gas. Officials said the question arises as to how a gas transmission and distribution company can give an ad for selling natural gas. It is not an E&P company which can seek bids for auctioned price under amended E&P policy. "This is all being done to discourage the private sector."

The E&P companies -- OGDCL, Mari Energy, Pakistan Petroleum Limited, Pakistan Oil Field Limited, MOL, GHPL in a meeting with Prime Minister Shehbaz Sharif had pledged that they were ready to invest $5 billion for exploration and production activities but they had linked their investment with the approval of the amended E&P policy. "The amended E&P policy is now in place, but in a strange move, SNGPL has created a company to purchase the gas at auctioned price and sell it like private sector companies," the officials said.

The Board of Directors of SNGPL on June 26 approved the creation of a subsidiary with a paid-up capital of Rs1 billion, and to this effect SNGPL has informed Pakistan Stock Exchange as a material information.

This subscribe sent, on June 26, a question to the SNGPL spokesperson seeking the rationale behind the creation of the subsidiary, but received no response.

However, when contacted Ogra said that it has also come to know that SNGPL has created a subsidiary, but when it comes to it for seeking license, then it will decide that this subsidiary can take part being the government entity in getting gas at the auctioned prices and sell it to the clients.

When asked as to how Ogra gave licence to Alternate Energy Limited, a subsidiary of Sui Southern, the regulator said that this license was given much before the approval of the amended E&P policy 2012. ■

ENERGY UPDATE | PSA PAKISTAN SOLAR ASSOCIATION

Energy Update and PSA holds Webinar

Taxing solar panels & change in Net-metering policy hurts solar growth and environment experts warn

Mustafa Tahir

The imposition of General Sales Tax (GST) on import of solar panels, regardless of the final tax rate decided by the federal government, will not slow down Pakistan's accelerating transition to renewable energy. This progress is driven by the unwavering commitment of end-consumers and businesses dedicated to improving environmental conditions and reducing the carbon footprint of Pakistan's power sector.

This was the collective view expressed by clean energy experts, industrialists, climate activists, and renewable energy traders during a webinar examining the federal government's recent budgetary proposal to impose GST on solar panels. The proposed measure aims to encourage local manufacturing of renewable solar panels.

The webinar, titled "Taxing the Sun: Will Solar Still Shine in Pakistan?", was jointly organised by Energy Update and Pakistan Solar Association (PSA).

PSA Chairman Waqas Moosa opened the discussion by thanking environmental advocates and non-governmental organisations for their continued support of solar energy adoption by households and commercial users. He emphasised that shifting to solar power is a critical means to reduce dependence on polluting fossil fuels.

Moosa highlighted that the decade from 2020 to 2030 has been globally recognised as a pivotal era for transitioning to clean energy. He predicted that Pakistani consumers would persist in embracing solar energy to power their homes and businesses, regardless of the added cost from GST.

He cautioned, however, that Pakistan's local industry is not yet sufficiently developed to meet the growing demand for advanced solar panels in adequate quantity. As such, relying solely on local production at this stage could risk stalling progress.

Moosa called for a national awareness campaign to encourage industrial users to adopt solar solutions, enabling them to cut emissions and gain better access to international markets where sustainably produced goods are increasingly in demand.

He strongly criticised the proposal to tax imported solar panels, calling it a serious setback to Pakistan's efforts in combating the climate crisis.

"Whether or not a tax is implemented", he said, "domestic consumers will continue shifting to solar energy due to persistent power shortages and unaffordable electricity tariffs from the national grid." Muhammad Zakar Ali, CEO of Inverex Solar Energy, echoed this sentiment. He said that the vast majority of electricity users in Pakistan now understand the long-term value of clean energy and will continue to transition away from grid-supplied electricity, regardless of tax implications.

Ali argued that Pakistan needs a minimum of 18 to 24 months to establish a viable local industry capable of producing clean energy equipment at scale. Imposing a tax prematurely, he warned, could deter both domestic and international investors.

He further noted that high electricity tariffs for industrial users could discourage investment in solar panel manufacturing plants. He, however, remained optimistic, predicting that prospective Chinese investors would soon launch joint ventures with Pakistani industrialists to set up such facilities. Ali explained that establishing local solar panel manufacturing plants could lead to the development of five supporting vendor industries, significantly boosting the clean energy supply chain in Pakistan. He also urged both federal and provincial governments to expedite initiatives for installing solar systems on the rooftops of public sector buildings and government offices. Dr Khalid Waleed, Research Associate at the Sustainable Development Policy Institute (SDPI), said the surge in rooftop solar installations in urban centres presents an opportunity for Pakistan to earn carbon credits on the global climate finance market.

Naeem Qureshi, Managing Editor of Energy Update, expressed appreciation for Sindh Energy Minister Syed Nasir Hussain Shah for vocally opposing the federal government's proposed tax on imported solar panels and changes to the net-metering tariff regime. He commended the Sindh government's partnership with the World Bank in promoting rooftop solar installations on public buildings to reduce dependence on conventional energy sources.

Former vice President Karachi Chamber of Commerce and Industry Tanveer Barry pointed out that while Pakistan's installed electricity generation capacity exceeds 45,000 megawatts, only around 27,000 megawatts are currently deliverable to end-users due to the outdated and overburdened transmission infrastructure.

Barry also highlighted the immense untapped potential for solar energy adoption among off-grid rural households and agricultural communities across the country.

Nadeem Ashraf, CMO Energy Update, also spoke during the session and delivered the vote of thanks to the participants and guest speakers for their valuable insights. ■

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Allocations for water reserves shrink despite tensions

Khalid Hasnain

As several crucial water-storage and dam projects in Pakistan — either planned or under construction — grapple with declining allocations, delayed cash flows, and interrupted releases, the decision to reduce annual funding for water-sector initiatives under the Public Sector Development Programme (PSDP) and Annual Development Programme (ADP) is not only surprising, but deeply alarming.

This cut comes at a time when India has increasingly threatened to curtail downstream river flows to Pakistan, further exacerbating the situation. In the newly tabled federal budget for 2025-26, the Ministry of Water Resources was allotted Rs133 billion under PSDP — Rs2bn less than the previous fiscal year, which ends on June 30, 2025. This reduction is particularly concerning given the ministry's own admission that it failed to complete 25 out of 59 water-sector projects during the fiscal year 2024-25.

Finance Minister Muhammad Aurangzeb revealed in his budget speech that only 34 projects were completed at a cost of Rs295bn, leaving a quarter of the planned work unfinished. Of the Rs133bn allocated this year, Rs102bn is dedicated to 34 ongoing projects. Of this, Rs95bn is earmarked for 15 key initiatives — including Rs32.7bn for Diamer-Basha Dam, Rs35.7bn for Mohmand Dam, Rs3.2bn for Karachi's bulk water supply (K IV), Rs10bn for lining the Kalari Baghar Feeder Canal, Rs4.4bn for telemetry systems in the Indus basin, Rs1.8bn for the Patt Feeder Canal, Rs690 million for Kachhi Canal flood repairs, and Rs5bn for Awaran, Panjgur, Garuk and Gishkor dams.

Water experts have expressed strong concern over this decline in funding, especially given India's unilateral suspension of the decades-old Indus Waters Treaty and its threats to restrict Pakistan's river flows.

Former Wapda member (water) Jawaid Latif lamented that the sluggish progress on reservoirs, dams and hydropower schemes stems mainly from low PSDP allocations, insufficient cash flow, inflationary pressures and frequent design changes.

According to Wapda's own monthly report, nine major storage projects — including Diamer-Basha (4,500MW), Mohmand, Nai Ganja, Kurram Tangi stages I and II, Mangla Dam raising, Gomal Zam, Satpara and Darawat dams — are either ongoing or completed.

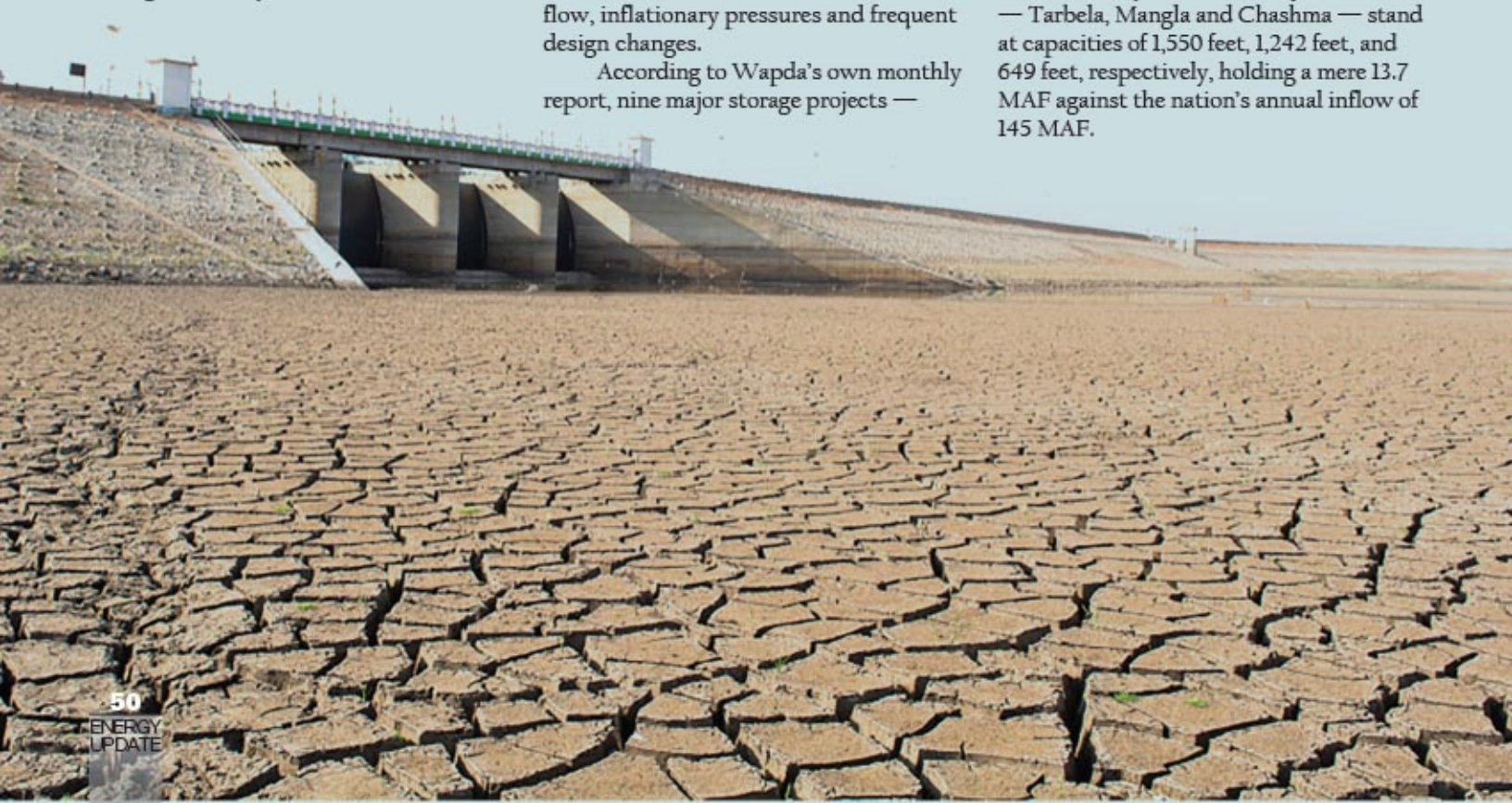
Meanwhile, 11 hydropower schemes such as Dasu Stage-I, Tarbela extensions and Neelum-Jhelum, along with 10 additional dams like Chiniot, Bhimber, Hingol and Bara, are at various study or construction stages.

Projects with timeline

Wapda anticipates completing Diamer-Basha by 2029, Mohmand by 2027-28, and Nai Ganja by 2026. Run-of-the-river Dasu Stage-I and the Tarbela 5th Extension are expected in 2027 and 2026, respectively, while K IV Stage-I and the Kachhi Canal extension are slated for completion in 2026 and 2025.

The 18.4MW Kurram Tangi Stage-I is projected to be finished by December 2025. Once completed, these projects are expected to generate over 9,012MW of electricity and add 9.693 million acre-feet (MAF) of water storage to the national grid by 2029.

Presently, Pakistan's major reservoirs — Tarbela, Mangla and Chashma — stand at capacities of 1,550 feet, 1,242 feet, and 649 feet, respectively, holding a mere 13.7 MAF against the nation's annual inflow of 145 MAF.



Allocations

Under the PSDP for the ongoing fiscal year, the government, in accordance with the Water Resource Development Programme Vision-2025, allocated Rs107.664bn instead of the reported Rs135bn, whereas the expenditure on various projects remained over Rs93.5bn till April 30.

The allocations for dams or water storage projects in FY25 under PSDP amount to over Rs63.3bn, followed by Rs39.34bn for canals' projects, Rs3.09bn for research, investigation and monitoring and Rs1.94bn for engineering studies. Likewise, the allocation for hydropower projects was Rs169.92bn, whereas the expenditures till April 30 were Rs74.47bn.

For hydropower study projects, Rs8.3bn was allocated, whereas the expenditures were just Rs787m till April 30. It means that either the government made fewer releases or Wapda couldn't utilise the funds fully as allocated under the PSDP. For fiscal 2026, Rs90.2bn has been allocated for the generation and provision of cheap and green electricity projects.

Chenab and Chinot dams

Terming the Chenab River "the most vulnerable" as Pakistan that has a complete right to use under Indus Waters Treaty has no dam in its basin, while India made various run-of-the-river projects on this river, the official said, suggesting the government immediately start work on the Chiniot dam, which is ready for construction project.

Talking to Dawn, Riaz Hussain, a water resource engineering specialist, said Pakistan's current water crisis is a function of insufficient storage, erratic supplies and external geopolitical pressures. With only 13.7 MAF of water storage against an annual inflow of 145 MAF, the country loses valuable surface runoff.

Nearly 80 per cent of Pakistan's cultivable land — roughly 40m acres — relies on Indus Basin irrigation, while over 22m acres remain uncultivable primarily due to inadequate water availability and distribution. Recent Indian upstream interventions, exacerbated under strained bilateral relations, pose serious risks to downstream flows, undermining the Indus Waters Treaty. ■

Courtesy Daily Dawn

ENERGY NEWS

Hubco, PSO launch NEV charging station

EU Report

Hubco Green (Pvt) Limited (HGL), a subsidiary of The Hub Power Company Limited, in collaboration with Pakistan State Oil (PSO), has inaugurated its first state-of-the-art new energy vehicle (NEV) charging station on the Lahore-Islamabad Motorway (M-2).

This milestone marks Hubco Green's strategic entry into Pakistan's NEV market through its partnership with BYD Pakistan -- Mega Motor Company (MMC). The newly launched fast-charging station is part of a broader vision to develop a nationwide NEV charging infrastructure, with charging points planned every 200 kilometres (km) along the Karachi-Peshawar corridor. The initiative aims to eliminate range anxiety, enhance long-distance electric mobility and promote environmental sustainability.

Located at the Magic River Rest Stop, the new PSO Experience Hub not only offers electric vehicle charging but also features a modern Vibe Cafe and Store. Speaking at the launch, CEO of Hubco Kamran Kamal said, "Hubco Green is a strategic extension of our long-term view on where the country's mobility landscape is headed. Our focus is on building NEV infrastructure that matters most, creating value through the right partners. With this launch, we reaffirm our commitment to a cleaner, greener Pakistan."

Global Hydropower Generation Rebounds

EU Report

Hydropower generation made a strong comeback in 2024, growing by 10% to reach 4,578 terawatt-hours (TWh), according to the newly launched 2025 World Hydropower Outlook by the International Hydropower Association (IHA). The surge marks a significant rebound after years of stagnation and reinforces the sector's critical role in the global clean energy transition.

The report shows that global hydropower capacity increased by 24.6 gigawatts (GW) last year, including 16.2 GW from conventional hydropower and 8.4 GW from pumped storage hydropower (PSH). Total pumped storage capacity grew by 5% to 189 GW, underscoring its growing importance in stabilising grids with increasing shares of variable renewable energy.

The global hydropower development pipeline now exceeds 1,075 GW, with 600 GW of pumped storage and 475 GW of conventional projects. China continued to lead the sector, adding 14.4 GW of new capacity in 2024, including 7.75 GW of pumped storage. Africa also achieved a milestone, commissioning 4.5 GW—more than the combined total of the previous three years. In Europe, hydropower generation hit a decade-high of 680 TWh, supported by strong rainfall and favourable policy developments, particularly for pumped storage. Commenting on the findings, IHA President Malcolm Turnbull said the momentum was promising but required urgent policy reforms to sustain. "This year's Outlook shows that global new capacity is accelerating. But markets alone won't deliver what is needed. We must act boldly to reward hydropower's multiple benefits and speed up permitting. The only resource we lack is time," he said.

Climate crisis demands collective action

Severe impacts of climate change are becoming more visible

Faiza Riasat

The writer is a student of BSc Environmental Engineering NUST Islamabad

The severe impacts of climate change are becoming more visible and alarming with each passing day. Wildfires in North America, heatwaves across Europe, and catastrophic floods in Asia are stark reminders of a warming planet. Climate change is a reality that is reshaping lives, economies, and ecosystems in real time.

Developing countries are the most vulnerable to the escalating impacts of climate change. For Pakistan, the stakes are even higher. The country is witnessing environmental challenges that threaten its ecosystems, economy, and social fabric. In a recent Country Climate and Development Report by the World Bank, it is estimated that climate-related events can reduce Pakistan's GDP by 18–20% by 2050. These numbers frame a stark reality and set the stage for decisive action.

Over the past two decades, the country has experienced an alarming rise in extreme weather events. In 2022, heavy monsoon rains caused devastating floods, affecting over 33 million people, displacing 3 million, and resulting in over $30 billion in economic losses. Nearly two million homes were destroyed, and millions of livestock were lost. These events revealed not only environmental degradation but also the socio-economic fragility that climate disasters amplify.

According to the World Health Organization, environmental factors contribute to 200 deaths per 100,000 people in Pakistan annually. Further underscoring that outdoor air pollution in Pakistan contributes to around 22,000 premature deaths annually.

This health toll serves as a stark reminder for Pakistan to adopt climate change initiatives and focus on a collective and coordinated response. Public institutions, private companies, and communities must work together to build resilience, reduce emissions, and prepare for the future. The country's public and private sectors have a special responsibility to align their operations with climate resilience goals.

Exploration and Production (E&P) companies in Pakistan are increasingly recognising this responsibility. In December 2023, at the United Nations Climate Change Conference (COP28) held in Dubai, Pakistan's leading Exploration and Production (E&P) companies—OGDCL, PPL, and GHPL—signed the Decarbonization Charter. The accord highlighted their collective commitment to supporting climate change initiatives and aligning business operations with global sustainability goals.

Additionally, OGDCL has adopted several initiatives aimed at reducing its ecological footprint, promoting renewable energy, and supporting local communities. The company has launched a nationwide tree-plantation campaign. In collaboration with academic institutions and community centres across Pakistan, the company has planted thousands of trees to enhance biodiversity, improve air quality, and offset carbon emissions.

Beyond tree plantation, the company is also investing in renewable energy solutions. In Lakki Marwat, the company solarised 30 homes, offering off-grid communities access to clean electricity. Solar water pumping systems have also been installed in six communal sites across the Kharan and Noshki districts of Balochistan, ensuring sustainable water access in water-stressed regions. Furthermore, the company installed a 130 KVA solar system for the Pather Nala water project in Dera Bugti's Pirkoh area to ensure a consistent water supply.

To institutionalize its sustainability vision, OGDCL introduced its Greenhouse Gas (GHG) Emission Policy in 2023 and launched a comprehensive ESG (Environmental, Social and Governance) Strategy 2025. This strategy includes flaring reduction programs, methane leak detection systems, and the establishment of a corporate GHG inventory to set measurable emission reduction targets.

The journey toward climate resilience demands a whole-of-society approach. Governments must lead with policies and incentives. Citizens must reduce consumption and waste. And corporations must integrate sustainability into their business DNA. As we mark World Environment Day 2025, the message is clear: the time to act is now. It is the collective responsibility of all stakeholders to ensure that we respond with urgency, innovation, and commitment. ■

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ENERGY UPDATE MAGAZINE

Pakistan Global Business Summit 2025 Successfully Held in Lahore to Elevate SMEs on the Global Stage

The Pakistan Global Business Summit 2025 was successfully held at The Nishat Hotel, Lahore, hosted by Global SME Business Home (GSBH) Switzerland, under the leadership of Mr. Anis Khan (President), Ms. Amina Ahmed Raza (Country Head – Pakistan), and Mr. Saqib Majeed Sheikh (Advisor).

The summit focused on the critical role of Pakistani SMEs in global trade and aimed to facilitate their access to European markets through verified buyer connections, market research, visa facilitation, chamber affiliations, innovation, growth strategies, and regulatory assistance. Forward Sports (Pvt.) Limited – the world's largest soccer ball manufacturing facility – served as the Premium Partner, with special recognition to its Chairman Mr. Khawaja Masood Akhtar, who also graced the event as Guest of Honor and Keynote Speaker. The event received active support from the Swiss Asian Chamber of Commerce, PISMIDA, PRGMEA, PPIB, LCCI, and Energy Update, bringing together industry leaders and key stakeholders.

Distinguished attendees included:
Mr. Shahid Nazir Chaudhry, Vice President, Lahore Chamber of Commerce & Industry
H.E. Nurettin Demir, Commercial Attaché, Turkish Consulate Lahore
Mr. Khawaja Masood Akhtar, Chairman, Forward Sports
Dr. Ayyazuddin, PRGMEA
Mr. Syed Salman and Mr. Asif Khan, LCCI
Mr. Muhammad Ehsan Ansari, Commercial Head, Sea Power KSA
Mr. Syed Safeer Abbas, Chairman, LISMA
Mr. Muhammad Yaseen, Vice Chairman, PISMIDA
Mr. Muhammad Umair, Head, PISMIDA International Delegation
Mr. Muhammad Shakeel, MD, Kuehne + Nagel Pakistan
Mr. Khawaja Faiq, Chairman, Pakistan Romania Business Council

GSBH reaffirmed its commitment to connecting Pakistani SMEs with global markets through sustainable strategies and trusted partnerships. The Summit served as a meaningful step toward economic diplomacy and international collaboration for SME growth.

TRE Cycle, NFEH & SSWMB Sign MoUs to Drive Karachi Towards a Zero-Waste Future

In a major push for a sustainable and cleaner Karachi, two pivotal Memorandums of Understanding (MoUs) were signed at the National Incubation Center (NIC) Karachi under the Clean and Green Karachi Movement. The first MoU, signed between TRE Cycle — a woman-led waste management enterprise — and the National Forum for Environment and Health (NFEH), aims to promote ethical recycling, plantation drives, and public awareness. Ms. Ambreen Bilal Sheikhani, Founder & CEO of TRE Cycle, and Mr. Muhammad Naeem Qureshi, President of NFEH, formalized the agreement to foster grassroots environmental change through source segregation and sustainable waste handling.

The second MoU, involving Sindh Solid Waste Management Board (SSWMB), TRE Cycle, and Concern Waste Sindh and Recycling, focuses on landfill reduction, zero-waste initiatives, and public-private collaboration. SSWMB MD Mr. Tariq Ali Nizamani emphasized the need for collective action, while Concern Waste CEO Mr. Abdul Haq Banglani highlighted local community engagement. NIC Karachi Director Mr. Syed Azfar Hussain praised the alliances as powerful drivers of urban transformation. The event drew support from civic and industry leaders, including representatives from SITE, Telemart, Gadoon Textile, PACE College, and North City School of Arts, signaling broad-based commitment to a greener future for Karachi. ■

Titanium-Based Solar Panels 1,000 Times More Efficient Than Traditional Ones Developed in Japan

In a groundbreaking advancement, Japanese scientists have developed the world's first titanium-based solar panel, which—according to initial reports—could be up to *1,000 times more efficient* in energy conversion than conventional silicon-based solar panels. This new technology offers renewed hope for a revolution in the global energy sector. Silicon has long been the core material used in solar panel manufacturing due to its relatively low cost and abundance. Researchers in Japan chose titanium due to its lightweight nature, corrosion resistance, and chemical stability. The innovation lies in combining titanium dioxide with selenium in a specialized layered structure, which significantly improves light absorption and charge transfer—dramatically enhancing power output. Professor Toru H. Okabe stated, "We employed advanced technology based on rare-earth metals to reduce the oxygen content in titanium to levels never achieved before." Despite its extraordinary performance, titanium-based solar panel technology still faces several technical hurdles. If yttrium is not precisely controlled, it could compromise the corrosion resistance of the panels, making them less suitable for extreme environments such as deserts or space. Researchers are now focused on optimizing the yttrium ratio and refining processes to overcome these issues.

Govt Launches Rs2bn Scheme to Replace 88Mn Inefficient Fans, Targeting 7,000MW Energy Savings

The federal government is set to roll out a landmark 10-year initiative to replace 88 million old and inefficient electric fans across Pakistan, aiming to significantly reduce energy consumption and promote energy-efficient appliances. Backed by a Rs2 billion fund under the innovative "On-Bill Islamic Financing" model, the scheme will cover all power distribution companies, including K-Electric. The programme will target nearly 60% of the 147 million fans currently in use nationwide. Expected to deliver peak energy savings of 6,000–7,000 megawatts, the plan is anticipated to be officially launched by the prime minister later this month.

Minister Energy Sindh Nasir Shah inaugurated show room of EV car of Inverex Cake cutting ceremony at Inverex EV show room Karachi. Nasir Shah, CEO Inverex Zakir Ali Anas Zafar, Naeem Qureshi and other were celebrated this occasion.

Dewan Farooque Motors Assembles 300+ Units of 'Honri-VE' Electric Vehicle in Partnership with Eco-Green Motors

Dewan Farooque Motors Limited (DFML) has successfully assembled over 300 units of the Chinese electric vehicle 'Honri-VE' at its assembly facility within ten months of initiating EV production.

In a notification to the Pakistan Stock Exchange (PSX), DFML stated that these units have been delivered to Eco-Green Motors Limited (EGML) under a toll manufacturing agreement for onward distribution to customers. "Referring to our earlier communication dated October 11, 2024, we hereby inform that more than 300 units of 'Honri-VE' have been assembled and handed over to Eco-Green Motors Limited," the notice read. The company began EV production in September 2024 after receiving approval from the Engineering Development Board (EDB). DFML and EGML had signed a toll manufacturing agreement in June 2023, allowing DFML to produce Honri-VE vehicles using EGML's design and supplied materials. ■

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