

ENERGY UPDATE

TRANSFORMING PAKISTAN'S
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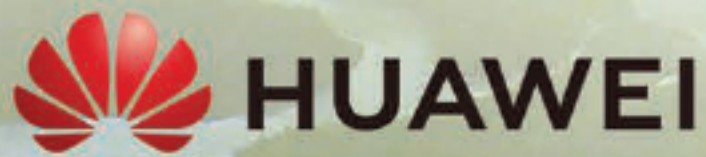
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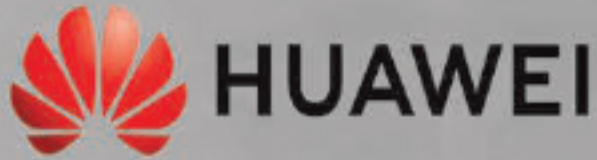
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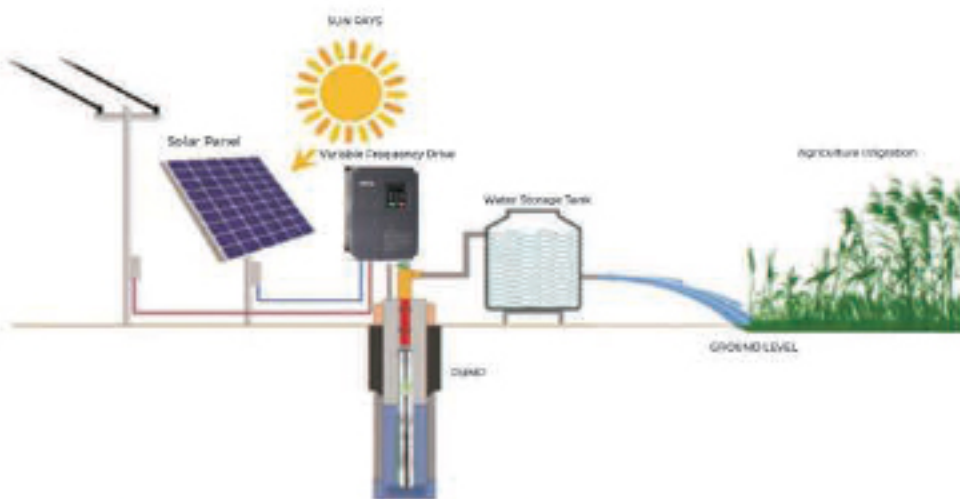
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FROM THE Editor's desk...

ENERGY UPDATE

Managing Editor

M. Naeem Qureshi

info@energyupdate.com.pk

energyupdate@gmail.com

Editor

Sajid Aziz

saziz75@gmail.com

Chief Financial Officer

Ruqiya Naeem

ruqiya.nfeh@gmail.com

Chief Marketing Officer

Engr. Nadeem Ashraf

marketing@energyupdate.com.pk

nadeem.event@gmail.com

Marketing Consultant

Khalid Iqbal

hikhalid@live.com

Deputy Editor

Mustafa Tahir

mtmustafa92@gmail.com

mustafa@energyupdate.com.pk

Head of corporate Affairs and Sustainability

Halima Khan

mccm.energyupdate@gmail.com

Coordinator Lahore

Mohammad Asif

Art Director

Rizwan Ahmad

rizwanahmed55@gmail.com

Advisors

Zafar Sobani

Kalim. A. Saddiqui

Sohail Butt

Anwar Shahid Khan

Raziuddin Razi

Engr. Irfan Ahmed

Circulation & Subscription

Zahid Ali

Alizahid210@gmail.com

Shakeel Qureshi

Overseas Correspondents

Arif Afzal - USA

Kazim Wasti - Canada

Legal Advisors

M. Nadeem Sheikh Advocate

Monthly Energy Update

#309, Al-Sehat Centre, Hotel Regent Plaza,
Shahrah-e-Faisal, Karachi-Pakistan.

Tel: 021-3565 3676, 3521 3853, 35674570

Email: info@energyupdate.com.pk

Web: www.energyupdate.com.pk

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Unending gas crisis

Gas crisis continues to haunt common people and businessmen across Pakistan including Karachi, Lahore, Peshawar and Quetta as demand is rising gradually compared to the supply. Natural gas and imported LNG contribute more than 40 per cent to the country's current energy mix, including gas resources used in electricity generation. In recent years, the demand for gas has increased rapidly in Pakistan. However, gas exploration and production have declined, and the LNG operational and regulatory framework is weak, leading to a nationwide shortage and increased supply costs.

The gas crisis is badly affecting households, industries, and transportation across the nation. This crisis has been brewing gradually for the last 10 years, but recent data highlights the urgency of the situation and the call for finding immediate and comprehensive solutions by devising effective and efficient policies.

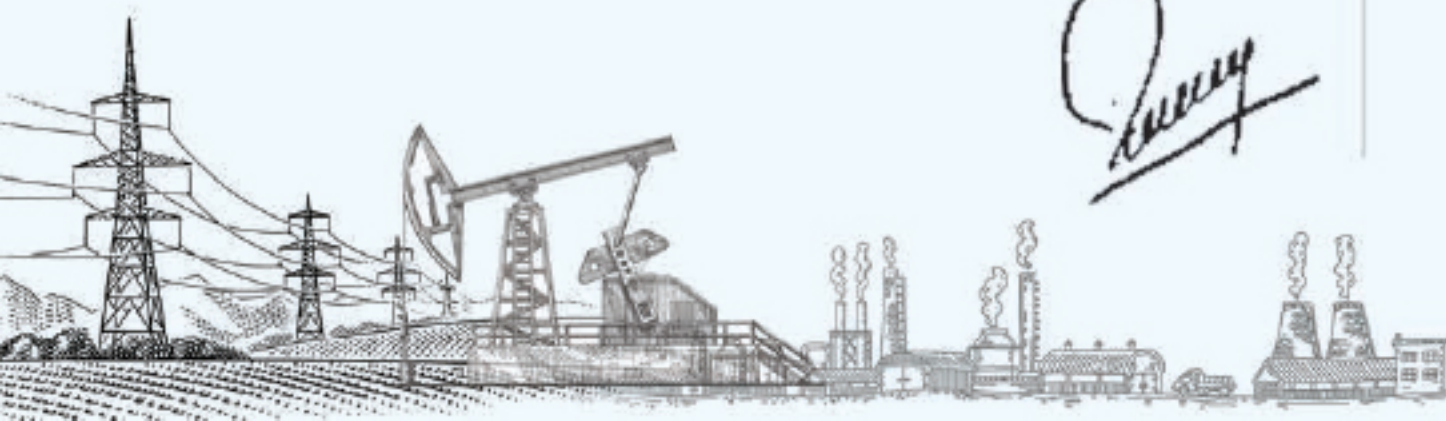
The residential sector is the largest consumer of natural gas in Pakistan, accounting for approximately 43% of the total gas usage. With around 9 million households relying on natural gas for cooking and heating, the sector is facing severe shortages. The shortage has led to significant disruptions, with many households experiencing erratic gas supply and forced reliance on alternative fuels.

The transport sector, which relies heavily on compressed natural gas (CNG), consumes around 15% of the total gas supply. CNG is a popular alternative to gasoline due to its lower cost, but the sector has been hit hard by the gas shortages. This has led to long queues at CNG stations and a rise in fuel prices, impacting daily commuters and the logistics industry.

Other sectors, including power generation and commercial enterprises, make up the remaining 11% of gas usage. Power plants that depend on natural gas for electricity generation are particularly vulnerable, leading to increased electricity outages and load-shedding. The country's gas infrastructure is outdated and cannot meet the growing demand. The reliance on imported liquefied natural gas (LNG) is costly and exposes Pakistan to volatile international markets. Inefficient management and corruption within the gas sector exacerbate the supply issues.

The gas crisis has far-reaching implications. Households are struggling with intermittent gas supplies, industries are facing reduced productivity and increased costs, and the transport sector is experiencing disruptions that affect both daily commuters and the broader economy.

Resolving the gas crisis in Pakistan requires a multi-faceted approach, including investing in gas exploration and infrastructure, improving management practices, and exploring alternative energy sources. There is also dire need to take decisive actions to get required outcomes. There is no need to beat about the bush.



Transforming Pakistan's Power Landscape

The Synergy of Solar Growth and Distribution Grid Modernization

Syed Faizan Ali Shah

The writer is a Renewable Energy and Grid Integration Expert. He is a Member of Prime Minister Committee for Solarization he can be approached at faizan_alishah@hotmail.com

Pakistan's consumers have long been grappling with a range of issues related to electricity supply. From extended periods of load shedding and poor power quality to soaring electricity costs and inadequate customer service, the challenges have been persistent. Whether due to unreliable infrastructure or inefficiencies in service delivery, consumers continue to bear the brunt of these shortcomings in the power sector.

In response to these challenges, the government has consistently worked to alleviate the adverse impact on consumers. During the 2013-2018 period, significant steps were taken, including the addition of RLNG-powered plants and the development of utility-scale solar and wind projects. Furthermore, the government focused on leveraging local resources, particularly Thar coal, to lower energy prices and move towards energy independence. While these initiatives initially resulted in reduced energy costs, the subsequent devaluation of the

rupee has led to an increase in capital (fixed) costs. Moreover, global disruptions, such as the COVID-19 pandemic and the Russia-Ukraine war, highlighted the vulnerabilities of relying on imported fuel, driving up energy prices and compromising Pakistan's energy security.

One key initiative undertaken by the government to support consumers, promote energy independence, and facilitate the energy transition is the introduction of Distributed Generation (DG) regulations, commonly referred to as Net Metering regulations in 2015. These regulations have been designed with a consumer-friendly approach from the outset, offering attractive buy-back rates for surplus electricity generation. The billing structure is favorable, allowing for the adjustment of off-peak generation against off-peak consumption—covering approximately 20 hours per day on energy needs.

Additionally, any excess units generated can be credited over a three-month period. Moreover, the regulations also establish a seven-year contract between the utility and the consumer, providing long-term stability. In line with the government's "ease of doing business" agenda, no license is required for DG systems up to 25kW, and consumers are permitted to install systems exceeding their sanctioned load, as outlined in the guidelines.

Combined with the declining cost of solar PV panels and the rising cost of grid electricity, distributed generation—particularly rooftop solar—presented an increasingly viable and attractive option for consumers with each passing year. Currently, the payback period of distributed solar PV systems with Net Metering is approximately 2 years while that without Net Metering is in the range of 3-4 years. It is also worth mentioning that Net Metering is allowed only for three phase consumers in Pakistan (this is important and will be discussed more later in the article, please keep in mind).

With the rapid decline in Solar PV prices, the adoption of distributed solar PV has expanded significantly over the last 4-5 years. Rough estimates suggest that approximately 6-7GW (all inclusive) of distributed solar is currently connected to the grid. While this appears to be a promising achievement on the surface, a deeper analysis reveals some concerning underlying issues.

Firstly, the overall energy demand of the country has been declining for the past couple of years while the peak demand has been increasing. Addition of distributed solar PV systems by consumers decrease the energy demand during the day time rendering the existing generation fleet redundant (or low in utilization), while such consumers shift back to the grid during the night and



increase the peak demand.

Secondly, the deployment of distributed solar PV systems follows a distinct locational pattern, primarily concentrated among three-phase consumers, who are often regarded as wealthier households or “elite” consumers. These users typically reside in affluent areas of major cities such as Karachi, Lahore, Multan, Islamabad, and Rawalpindi, and tend to use the grid primarily as a backup power source. During daytime, when solar generation is at its peak, these systems inject excess energy back into the grid (specifically during low load high irradiation months).

In neighborhoods where a high concentration of distributed generation exists, the collective output can effectively transform the street into a virtual power plant, feeding energy into the medium-voltage (MV) network. This reverse power flow can lead to an undesirable swelling of the consumer voltage profile, often pushing it beyond safe permissible operational limits, which create stability and quality issues for the grid.

Recently, Distribution Companies (DISCOs) have expressed concerns about reverse power flow, load loss, and poor power factor, attributing these issues to the increasing penetration of distributed solar. Simultaneously, the government has observed a decline in overall energy demand and a rise in peak demand, also linking these trends to the widespread adoption of distributed solar. In response, DISCOs have proposed limiting distributed solar generation as a solution to these challenges. However, while this may address short-term operational issues, it overlooks the broader potential of distributed solar as a key component of a sustainable and resilient energy system.

Instead of limiting solar integration, the focus should be on modernizing grid infrastructure, improving grid management practices, and leveraging advanced technologies like smart inverters and real-time monitoring systems to better accommodate distributed energy resources while maintaining grid stability.

The reality is that distributed energy resources (DERs), such as solar PV, battery energy storage systems, electric vehicles, virtual power plants, and microgrids, represent the future of the power and energy landscape. Advanced economies like the United States and Australia have made substantial investments in modernizing their distribution grid infrastructure right at the launch of their net

metering regulations, and they are now experiencing significant benefits.

A prime example is the Australian National Electricity Market (NEM), where on October 1st, 2024, rooftop solar contributed an impressive 43.78% of the peak energy demand. This demonstrates the transformative potential of DERs when supported by a resilient and modernized grid. Such advancements not only enhance energy security and sustainability but also enable more efficient grid operations and greater energy independence, positioning these economies to lead in the global energy transition.

Unfortunately, the government has invested very little in upgrading / modernizing the power distribution infrastructure (except for conventional enhancement of the distribution feeders and its 132kV substations) and, focusing predominantly on generation and transmission to address the challenges in the power sector. This lack of investment in modernizing the distribution network has left the grid ill-equipped to handle the growing complexities introduced by distributed energy resources, specifically the decentralized solar.

A notable example of this oversight is the failure to revise the distribution code since 2005. This stagnation in regulatory updates has hindered the ability of the distribution system to effectively integrate new technologies and adapt to the evolving energy landscape. Another pertinent example is the government’s current emphasis on Integrated System Planning, which largely overlooks the importance of distributed system planning. This approach focuses primarily on indicative generation planning and the expansion of transmission systems, neglecting the critical role that distribution networks play in the overall energy landscape.

The distributed generation regulations have been in place since 2015, and had DISCOs been proactive in adapting to this shift, they could have begun the critical work of developing an advanced distribution grid—commonly referred to as a smart grid. But what exactly is a smart grid?

A smart grid refers to the transformation of a conventional power grid into a more advanced system through the deployment of monitoring and control equipment at key points in the distribution network. This technology enables real-time tracking and management of power flows to and from consumers, ensuring reliable and efficient energy

delivery. By incorporating advanced automation, the grid can make informed operational decisions or empower distribution system operators (DSOs) to take actions remotely. This modernized infrastructure enhances grid resilience, optimizes resource utilization, and supports the seamless integration of distributed energy resources, thereby future proofing the energy system.

Smart meters at the consumer level, along with transformer monitoring systems installed at distribution transformers, enable continuous tracking of energy consumption and other critical network parameters. By centralizing this data at a Distribution System Operation Center, operators can send real-time signals to consumers, facilitating better management of energy flows to and from the grid.

A key example of this smart grid functionality is the use of advanced solar inverters, adhering to the IEEE 1547 standard. These inverters allow utilities to adjust active power output by dynamically injecting or absorbing reactive power from rooftop solar PV systems. This capability helps manage the voltage profile of the grid, keeping it within permissible limits, especially in areas with high solar penetration.

Such measures not only improve the integration and utilization of distributed energy resources but also have the added benefit of reducing theft and technical losses within the distribution network. Additionally, this infrastructure allows utilities to curtail unwanted active power from distributed generation sources while enabling their participation in reactive power support, ultimately enhancing grid stability and performance.

However, achieving this requires a clear regulatory framework, advanced technological expertise, and consistent efforts from the relevant authorities in the energy sector. It must be emphasized that harnessing the benefits of distributed solar—funded by consumer investments—presents a more efficient alternative to large-scale, centralized capacity procurement managed through government channels. This approach reduces the need for extensive capital expenditures on transmission infrastructure, such as long-distance evacuation lines, allowing those resources to be redirected towards the modernization of the distribution grid. By focusing on strengthening distribution grid systems we can greatly increase the share of clean and affordable energy via effective monitoring and control of the network. ■

Sindh Governor unveils LONGi's latest Hi-Mo X10 solar panels at Karachi's grand gala event

Mustafa Tahir

Governor Sindh, Kamran Khan Tessori, at a grand gala event held at one of Karachi's top-notch hotels, unveiled new solar panels introduced by LONGi, one of the world's leading clean energy companies.

The Governor Sindh took part in the unveiling ceremony for LONGi's new product, the Hi-Mo X10 solar panels. During the event, he presented awards to leading distributors and traders in Pakistan's clean energy market.

Speaking on the Occasion, Alex Li, GM Central Asia branch of MEA & CA Region, LONGi Solar, said that LONGi has always been at the forefront of solar technology innovation. "We are excited to bring these advancements to Pakistan, where solar energy is a vital component of the energy mix".

He further emphasized that these innovations would not only contribute to

the country's renewable energy goals but also provide sustainable, efficient solutions for both residential and industrial applications.'

The clean energy experts who spoke on the occasion welcomed the introduction of new LONGi solar products, specifically the LONGi Horizon, in the Pakistani market to turn around the lives of around 50 million under-privileged people in faraway rural areas

who don't have access to grid-supplied electricity, providing the possibility for people in areas without electricity to use affordable electricity. The audience was informed that around 700 million people around the world didn't have access to electricity and also needed such latest technological innovations from the clean energy sector to revolutionize their lives and rescue them from the vicious circle of poverty.



The LONGi's R&D section has been constantly working to introduce cost-effective solutions to efficiently energise homes, farms, small businesses, cattle pens, schools, and shops in such remote off-grid villages. Ali Majid, LONGi's Country Director in Pakistan, said the LONGi Horizon would massively assist the small farmers in far-flung rural areas by electrifying most efficiently all their essential farming equipment and machinery.

Mehfooz A Qazi, Director of Sindh Solar Energy Project, informed the audience about the plans of the provincial government to promote renewable energy sources to give maximum relief to the end-consumers of electricity.

He said the Sindh government had launched the World Bank-funded Solar Energy Project mainly to benefit the underprivileged people in off-grid areas who would be given solar home systems to energize their homes.

He said that utility-scale solar parks would also be established in Karachi and Jamshoro to increase the share of clean power in the grid-supplied electricity.

He told the audience that another important component of the project was utilizing rooftops of public sector buildings in Sindh for installing solar panels.

MNA and eminent industrialist, Mirza Ikhtiar Baig, said that widespread use of solar power would help reduce the energy costs of businesses, which is a major concern for the business fraternity these days.

He said the Pakistani business community fully supported new technological innovations introduced by renewable energy companies to resolve the lingering electricity crisis in the country.

In his keynote speech, Adviser to Sindh Governor, Tariq Mustafa, extended his heartfelt gratitude to LONGi for their commitment to providing cutting-edge solar solutions that are transforming the energy landscape of Pakistan.

"Our nation stands at the precipice of a clean energy revolution. The Pakistani clean energy market is not only thriving but is also open and receptive to foreign investment. With our abundant natural resources, particularly our unparalleled solar power potential, we have an extraordinary opportunity to harness renewable energy for the betterment of our economy and our environment," said Mustafa.

He said that it is important to recognize the significant contribu-

tions of companies like LONGi. Their dedication to bringing the latest clean energy technology to Pakistan's consumers is commendable and essential. LONGi's innovative solutions empower individuals and organizations alike, addressing the pressing demand for uninterrupted power supply that fuels both homes and industries, said the Adviser to the Governor.

He told the audience that Pakistan was endowed with one of the richest solar radiation profiles in the world. "Yet, to unlock this vast potential, we need partners who are willing to invest in our capabilities, and LONGi stands as a prime example of this spirit. Their endeavours not only promise affordable electricity for the everyday consumer but also operational efficiency for businesses that can thrive without the burden of exorbitant energy costs," he said.

"In recognizing the services rendered by LONGi and similar companies, we take a significant step towards alleviating the energy crisis our populace faces. Their cutting-edge solar technologies are vital in ensuring affordable energy, which in turn supports national productivity and economic growth," said Mustafa.

He urged the audience that the broader implications of shifting towards renewable energy shouldn't be forgotten. The efforts of companies like LONGi are critical in bolstering our government's initiatives aimed at improving our environmental conditions, he said. "By reducing our reliance on fossil fuels, we are actively participating in the global fight against climate change," the Adviser to the Governor added.

Additionally, adopting solar energy greatly lowers the carbon footprint of our energy sector. The government has established ambitious goals and policies to enhance clean energy production and reduce reliance on imported fossil fuels, securing our energy future and bolstering the economy by keeping resources within our borders, He added.

"Today, I want to emphasize the importance of solar technology for the sustainability and growth of businesses, especially those heavily impacted by high energy costs. In an era where operational costs can determine success, accessing renewable energy is not just an option; it's a necessity."

The event showcased the new Hi-MO X10 solar panel, which sets new standards for energy efficiency, durabil-

ity, and reliability. Attendees enjoyed a live demonstration of the panel's innovative features and participated in a networking session with key leaders from the renewable energy sector to share insights and explore collaboration opportunities. The evening wrapped up with refreshments and a gala dinner, creating a relaxed space for further discussions and connections.

LONGi's new solar panels represent a leap in solar technology, offering significant improvements in energy efficiency and reliability. The Hi-MO X10 panel features up to 24.8% efficiency with a power output of 670W, making it one of the most powerful and efficient solar modules available. Leveraging HPBC 2.0 technology and a thicker wafer design, the Hi-MO X10 enhances power generation under varying light conditions, making it ideal for sunny mornings, evenings, and even cloudy days.

The Hi-MO X10 solar panel features double glass and is available in both monofacial and bifacial options, offering several key features, including Anti-Humidity & Heat, that ensure long-term performance and reliability. It also offers lower degradation, allowing for sustained energy output over time, and an improved temperature coefficient, which enhances power generation by 3% in varying conditions. Additionally, the panel minimises the risk of failures caused by current nonuniformity, greatly improving system reliability. Its zero-light loss technology further boosts efficiency by reducing energy losses, making it a highly reliable and efficient option for solar energy production.

Moreover, the Hi-MO X10 is also tailored for premium rooftop and ground-mount installations, where direct sunlight optimisation is key. Unlike other modules, the double glass design of Hi-MO X10 focuses solely on capturing direct sunlight, achieving ultra-high efficiency levels of up to 24.8%. Its durable design ensures longevity, making it a cost-effective solution for projects aiming to lower their Levelized Cost of Energy (LCOE).

With the launch of Hi-MO X10 panels, LONGi reaffirms its commitment to accelerating the adoption of renewable energy in Pakistan. These panels are expected to support the country's efforts in meeting its renewable energy targets, providing reliable and high-performance solutions for both residential and industrial applications. ■

Tariq Electric

improving energy efficiency in manufacturing

The company is exploring opportunities to expand its portfolio in renewable energy, with a keen interest in solar and wind projects, says Haris Tariq

Haris Tariq

CEO, Tariq Electric



Mustafa Tahr

Energy Update magazine conducted an interview with Haris Tariq, CEO, Tariq Electric, in which he said that his company has adopted practices that minimize its environmental impact, such as improving energy efficiency in its manufacturing processes and installation of 300kW Solar System to play its role in reducing carbon emission in the environment. Since the outset, the company sought to fill a gap in the local market by producing top-tier MV/LV electrical panels, ensuring that industries had access to the equipment necessary for stable and safe power distribution.

Q. Can you share the vision behind the founding of Tariq Electric and how it has evolved over the years?

HT: TARIQ ELECTRIC was founded with the vision of providing reliable, efficient, and high-quality electrical solutions for Pakistan's growing industrial and commercial sectors. Since the outset, the company sought to fill a gap in the local market by producing top-tier MV/LV electrical panels, ensuring that industries had access to the equipment necessary for stable and safe power distribution.

Over the years, the company has evolved from a small operation into a leading manufacturer, expanding its product line, adopting international quality standards, and investing in modern technologies and machinery. This transformation was driven by a commitment to innovation and the goal of supporting Pakistan's infrastructural growth.

Q. How do you view the current state of the electric industry in Pakistan, and what opportunities do you see for growth in the next five years?

HT: The electric industry in Pakistan is at a pivotal point, as the demand for reliable power continues to rise, spurred by industrial growth, urbanization, and a growing population. However, challenges such as energy shortages, aging infrastructure, and reliance on non-renewable energy sources persist.

Amidst these challenges, opportunities for growth are abundant, particularly in renewable energy, grid modernization, and energy efficiency projects. The next five years are likely to witness major investments in these areas as Pakistan aims to diversify its energy mix and reduce its carbon footprint.

Q. Are there any plans to further invest in renewable energy projects, such as solar or wind, in collaboration with government bodies or private enterprises?

HT: Tariq Electric is exploring opportunities to expand its portfolio in renewable energy, with a keen interest in solar and wind projects. Given Pakistan's push towards a greener future, collaboration with government bodies and private enterprises could enable significant advancements in this sector. The company is considering partnerships that would help facilitate solar and wind power solutions, making them more accessible to industries and communities alike.

Q. What role does technology, such as smart grid solutions and energy storage, play in your future strategy?

HT: Technology is a core part of Tariq Electric's future vision. The company is actively evaluating smart grid solutions and energy storage technologies to enhance the efficiency of power distribution. These innovations are crucial for ensuring reliability and flexibility in power networks, especially as renewable energy sources are integrated into the grid.

Q. How is Tariq Electric contributing to social welfare and sustainability beyond the business operations?

HT: Beyond business operations, Tariq Electric is committed to corporate social responsibility (CSR) initiatives aimed at sustainability and social welfare. The company supports various community programs, focusing on education, healthcare, and environmental preservation.

In terms of sustainability, Tariq Electric has adopted practices that minimize its environmental impact, such as improving energy efficiency in its manufacturing processes and installation of 300kW Solar System to play its role in reducing carbon emission in the environment. ■



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ASSESSMENT OF PAKISTAN'S CLIMATE LOSSES AND FUNDING

Federal climate fund allocation is around 1% of total budget while in Punjab, it is below 1% and in Khyber Pakhtunkhwa, it is less than 0.5%; Pakistan loses \$4 billion annually due to climate change; 7253 glaciers are rapidly melting in country; annual expected damage from riverine floods by 2050 is projected to surge by 47 percent

Muhammad Naeem Qureshi

The Writer is Managing Editor of Energy Update and Environment Activist

As per UN, Climate finance refers to local, national or transnational financing that seeks to support mitigation and adaptation actions that will address climate change. The Convention, the Kyoto Protocol and the Paris Agreement call for financial assistance from Parties with more financial resources to those that are less endowed and more vulnerable.

This recognizes that the contribution of countries to climate change and their capacity to prevent it and cope with its consequences vary enormously. Climate finance is needed for mitigation, because large-scale investments are required to significantly reduce emissions. Climate finance is equally important for adaptation, as significant financial resources are needed to adapt to the adverse effects and reduce the impacts of a changing climate.

According to a Transparency International Pakistan's (TIP) report, Pakistan loses \$4 billion annually due to climate change while 7253 glaciers are rapidly melting in the country. The Indus flood plain faces geographical risk. In the country, 10,000 plus heat wave deaths have occurred since 2000 while 80% of crops were destroyed and 30 million people affected during 2022 floods in Sindh.

Pakistan chaired the G77+China group of countries in 2022 when the Loss & Damage Fund was finally approved. Country's targets for UNFCCC by 2030 revised in 2024 are as: 30% of all new vehicles sold in the country will be electric while there will be 50% reduction in all greenhouse gas emissions besides 60% of all energy production will be renewable.

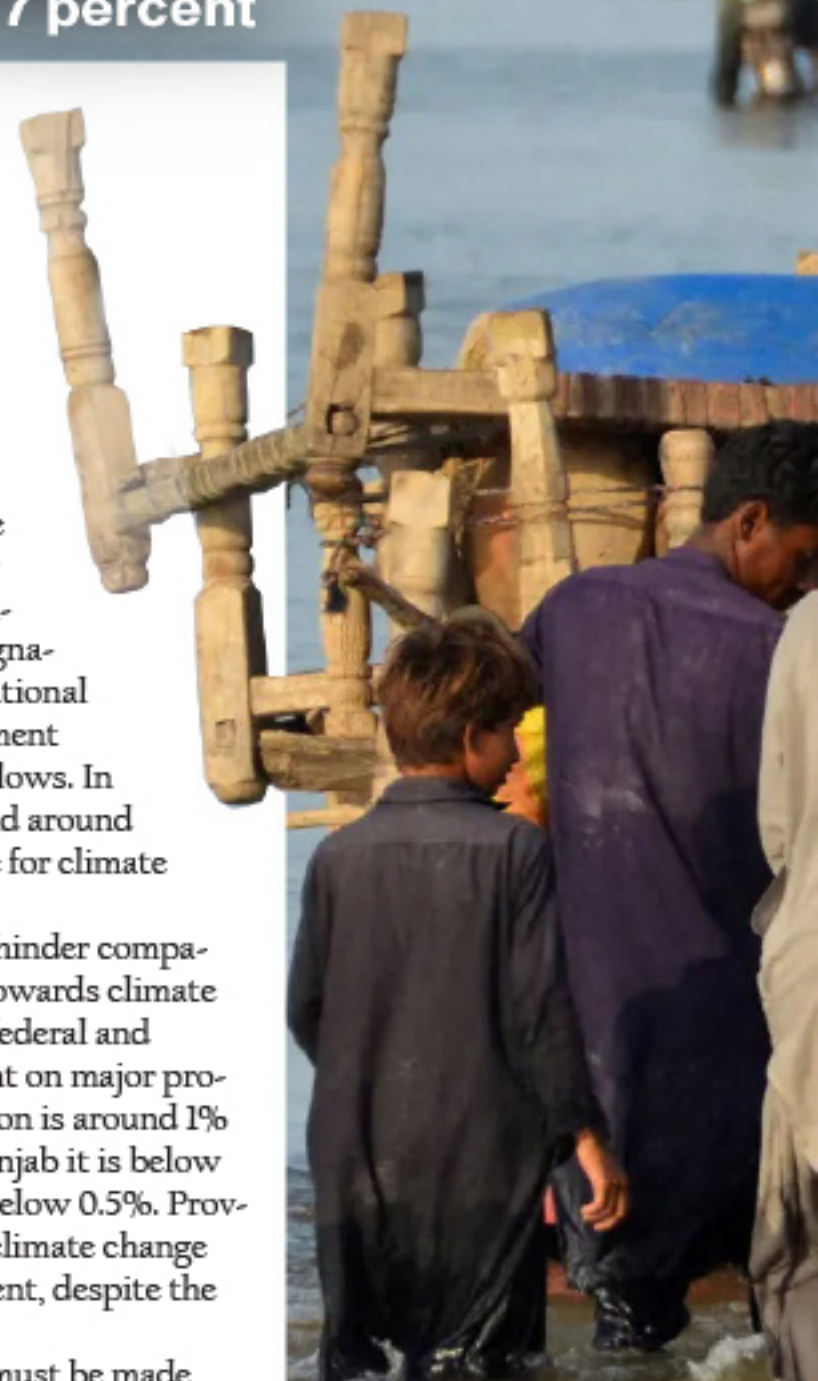
Pakistan has made its NDC commitments contingent upon receiving adequate finance. Given climate finance inflows are very low, these commitments cannot be implemented without international support. Pakistan has received \$1.4 – 2 billion

annually for the last 10 years, from bilateral & multilateral sources. Pakistan's top 3 bilateral climate financiers are Japan with \$48,913,000 (37%); United Kingdom with \$34556000 (26%), and Germany with \$25,555,000 (19%).

The Ministry of Climate Change and Environment (MoC-CEC) plays crucial roles in climate governance. Budget allocations for the Ministry experienced initial increase, followed by a period of stagnation. Government oversees international projects implemented by development partners without direct financial flows. In Budget 2024-25, 15.3% of PSDP and around 8% of govt. running costs set aside for climate impacts.

Differing budgetary formats hinder comparable analysis. Direct allocations towards climate objectives remain limited at both federal and provincial levels, heavily dependent on major programs. On average, federal allocation is around 1% of total budget outlay, while in Punjab it is below 1% and in Khyber Pakhtunkhwa below 0.5%. Provinces have allocated less towards climate change compared to the Federal government, despite the former having wider jurisdiction.

Scoring Guidelines: scoring must be made mandatory for any expenditure greater than PKR 500 million. Scoring criteria may be divided into three categories: Poor (-1), Satisfactory (0), and Good (1). Scoring checklists can be used by planners to prepare relevant documentation and analyses. Scoring gives highest priority to project proposal stage, while inclusion of climate is necessary at planning stage, and project integrity can be ensured by climate-relevant auditing & oversight. Scoring can also be used to reject projects if they do not appropriately include climate-responsible planning. In the future, a scoring cutoff can be included to approve or reject projects, such as rejecting projects which fail to score 50% of total or 60% in





one of the key areas.

There is a need to enhance provincial climate budgetary allocations in proportionate to the scale of the climate crisis. Compliance with Public Procuring Regulatory Authority (PPRA) Rules to enhance transparency of climate projects is also necessary besides there is a need to boost climate governance integrity using global best practices. It is also essential to establish an open database on climate finance besides ensuring appropriate mechanisms to capture complaints and enforce anti-corruption measures.

According to the Economic Survey of Pakistan 2024, in the face of global climate challenges, Pakistan emerges as a nation grappling with the disproportionate impact of climate change despite its relatively minor contribution to global greenhouse gas emissions. The average temperature in Pakistan has increased by 1°C since the 1980s and is projected to continue rising. Climate change has significantly affected the Indus River Delta, situated at the confluence of the Indus River and the Arabian Sea. With increased temperatures and rising temperature volatility, Pakistan will see increased climate related severities in the future. The most serious effects of climate change in Pakistan are expected to increase severe drought and volatility in extreme precipitation events, leading to more mudslides and landslides.

The Finance Wing has two units, one dealing with Carbon Trading and the other facilitating access to private and global climate finance. A dashboard has also been prepared to coordinate with all the development partners to attract global climate finance through the different projects related to climate change. The Global Environment Facility (GEF) and Green Climate Fund (GCF) Steering Committees of Pakistan are actively reviewing and submitting various funding proposals related to climate finance. Climate Finance Strategy would be a comprehensive document covering access to all types of climate finance. These initiatives are expected to gain momentum gradually, and Pakistan will be able to capture a significant amount of financing.

The annual expected damage from riverine floods by 2050 is projected to surge by 47 percent. The fraction of the population exposed to heatwaves yearly is expected to increase by 32 percent by 2050, respectively. Labour productivity is projected to decline across the board because of escalating heat stress—by 7 percent. Climate change will likely severely impact the agriculture sector, increasing food production and access pressure. For example, by 2050, the annual mean wheat yield will decline by 1 percent (RCP 4.5) and 2.5 percent (RCP 8.5), respectively. Precipitation changes and declining water availability could damage riverine ecology, impair water security, and affect hydropower production. Sea-level rise will contribute to the further salinization of soils and coastal erosion, and inundation will harm fisheries and aquaculture. Air and water pollution will aggravate human health, especially those living in vulnerable areas. ■

A power sector malady

Consistent policy required to guarantee future investments in power sector and ensure tariff reduction

Nasir Jamal

In 1995, the 1,292 megawatt (MW), \$1.6 billion Hub Power Project was hailed as an important precedent for the viability of private finance for a major infrastructure project in a developing country. No other low-income country had made private investments a cornerstone of its energy policy at that point in time.

This strategy was a reflection of hard economic realities: an unsustainable fiscal deficit, a serious balance of payment situation, and the inability of the public sector to finance investments needed to keep pace with power demand. The experience led Pakistan to adopt its first private power policy, under which the government contracted 3,400MW capacity with 19 independent private power projects (IPPs).

However, by 1998, the second Nawaz Sharif government had issued notices of intent to terminate 11 IPPs, representing two-thirds of private power capacity contracted, on alleged corruption and/or technical grounds.

The project sponsors accused the authorities of initiating excessive coercion, harassment and heavy-handed legal actions to renegotiate tariffs or cancel contracts, which “contributed to Pakistan’s fall from grace in the eyes of the international private sector community”, according to a 2005 World Bank Study, “Lessons from IPP experience in Pakistan”. IPP sponsors claim that coercive tactics and threats of project cancellation are used in contract renegotiations to obtain tariff reductions

Most contracts were ultimately renegotiated, with an average decrease of 10pc in their levelised tariff. In

exchange for these concessions, the term of their power purchase agreements was extended from 20 years to 30 years.

A similar exercise was repeated in 2021, which helped the government extract concessions worth Rs836bn over a period of 20 years from the IPPs set up between 1990 and 2013 in exchange for payment of Rs403bn it owed to them. Background interviews with senior executives of private power companies at that time suggested that the IPPs might have been coerced into agreeing to new power purchasing agreements.

They were unanimous in alleging that the government had used the Mohammad Ali Inquiry Committee report on the IPPs to build a case against the power producers and force them into signing new contracts. “This isn’t a deal. We were told to ‘voluntarily’ give these concessions,” one of them had said at that time. The agreements covered 53 IPPs with a total capacity of around 8,000MW or nearly 23 per cent of the installed generation capacity. According to Tabish Gauhar, the then prime minister’s advisor on the power sector, the agreements with the IPPs would help reduce the circular debt stock, which stood at Rs2.3 trillion at that time, down to Rs1.9tr.

At least five IPPs — four developed under the 1994 power policy and one under the 2002 policy — have been asked by a task force backed by the powers that be to “voluntarily” terminate their power purchase agreements (PPAs) without any compensation.

A report in The News quoted one of the government negotiators as saying that if any of these IPPs don’t terminate their contracts, a forensic audit will begin immediately against them on allegations of wrongdoings. He contends that it will save the government Rs300bn in



capacity payments to be made to them in the next three to 10 years, and consumers would get relief of Rs0.60 per unit or equal to Rs60bn in one year.

He further stated that another 17 IPPs installed under 1994 and 2002 policies have been asked to switch over to take-and-pay mode from the present take-or-pay mechanism. The same conditions will be applied to the government-owned power companies representing 52pc generation capacity, and their capacity payments will be reduced to the minimum level.

Another Business Recorder report suggested that the government is set to announce revised agreements with the IPPs featuring significant tariff reductions, implying that the project sponsor has given in to the pressure tactics of the task force. Background conversations corroborate this assumption.

"We have our families here; our other businesses are also in Pakistan. How can we resist coercion and pressure? The threat of corruption inquiries and public humiliation is enough for investors to give in to the pressure," a 1994 IPP executive told Dawn.

The China-financed IPPs set up under the CPEC initiative do not constitute part of these tariff reduction negotiations as the government is separately trying to convince Beijing to restructure the \$15bn energy sector Chinese loan. IPPs and sector analysts agree that the way the government is forcing power producers to agree to revise their contracts will have a long-term impact on investments in the power sector and other areas of the economy. If the past experience is anything to go by, the risk premium on investment in Pakistan will increase manifold.

The recent failure of the government to sell the 600MW solar IPP in Punjab is a reflection of a lack of investor interest in the sector. Only a consistent policy could guarantee future investments in the power sector and tariff reduction. ■

Courtesy Dawn

GAS PROJECT

TAPI progression and Pak-Iran gas pipeline

TAPI pipeline progresses as Pakistan and India aim to resolve energy woes while Pakistan hesitates on Iran deal

Ishtlaq All Mehkr

Central Asia and South Asia are home to a cobweb of energy pipelines, but many are a victim of realpolitik. Bilateral disputes and meddling of extra-territorial forces are a constant that have ruptured geo-economics, leaving behind the resource-rich countries in a dilemma of their own. The energy-starved region, however, is contemplating to overcome constraints and a number of trans-regional megaprojects are on the anvil. They include CASA-1000, TAPI and Iran-Pakistan Gas Pipeline (formerly Iran-Pakistan-India), apart from several rail and road network schemes and bilateral ventures of gas transmission such as the \$2.5 billion Pakistan Steam Gas Pipeline project involving Russia and Pakistan.

Geo-economics, nonetheless, got a shot in the arm as the 1,814 km TAPI gas pipeline project graduated into its next orbit. It connects Turkmenistan, through Afghanistan, to Pakistan and India. The completion of the pipeline-laying inside Turkmenistan, and its aperture now ready for transit through restive Afghanistan, is a good omen. The \$10 billion multinational trans-regional initiative had seen ups and downs since 2015, and been hostage to lawlessness in Afghanistan for almost a decade. TAPI is a bonanza for the energy-starved region, and the good point is that it reconnects Pakistan and India in a consortium of economics after being made to bite the dust in a similar trilateral Iran-Pakistan-India (IPI) gas pipeline arrangement.

The euphoria among Afghans was worth mentioning as the Taliban 2.0 went on to declare a public holiday as Herat celebrated commissioning of the project on its soil. It is a win-win deal for Kabul as apart from receiving 16 per cent gas originating from Galkynysh gas field in Turkmenistan, it will also collect a staggering \$500 million per annum as transit fee. The fact that the strife-torn state kept its cool and succeeded in convincing the stakeholders to go ahead with the pipeline despite upheavals across its territory is commendable, and has les-

sons for Pakistan that could not stand pressure from the US owing to a regime of sanctions on Tehran. The gas pipeline traversing Central Asia to South Asia is the first of its kind post-Cold War regional amalgamation. It also underscores how strongly economic temptations override politics, and the regime in Afghanistan without de jure recognition is part and parcel of a legal instrument. The pipeline will see around 33 billion cubic metres of natural gas each year extracted from gas fields in southeast Turkmenistan, and will be pumped through Herat and Kandahar before crossing into the Balochistan province in Pakistan and ending in Fazilka in Indian Punjab. Pakistan and India will each purchase 42 per cent of the gas deliveries. It is surprising that no eyebrows were raised in the western states, irrespective of the fact that Central Asia is pro-Russia and Afghanistan is in a quagmire of instability.

Thus, there is an opportunity for Pakistan as TAPI comes full circle. With Islamabad under compulsion to buy expensive LNG to overcome its domestic and industrial demands, all it needs is to put its foot down and go ahead with the Iran-Pakistan pipeline. It is regrettable that the trilateral \$7.5 billion IPI pipeline withered in thin air as Delhi walked away from it, and Pakistan is yet to complete an 80 km pipeline from Gwadar to the Iranian border. Tehran on its part has invested more than \$2 billion and has brought the energy pipeline at the mouth of Pakistan, only to rust it beneath the dirt.

The incapacity of Pakistan to take a call on the gas pipeline with Iran has led to straining of relations with the Islamic Republic. Tehran is now under an international obligation to slap a penalty of more than \$18 billion for dishonouring the deal, and this fixation has also led to renewed tensions with Washington, whom Islamabad had failed to convince for a waiver. With the pendulum swinging astray, Pakistan's genuine energy needs are jeopardised and the vibrancy of connecting the respective states in geo-economics - especially Iran and Pakistan & Pakistan and India - has come to a naught. Pakistan must opt for tactful diplomacy and a principled sovereign stance to overcome this dilemma. ■

Diamer-Bhasha Dam: a solution to water, energy woes

Gulab Umid

The writer is an analyst based in Turbat

Pakistan's water resources can boost energy and agriculture, but poor planning stalls key infrastructure projects

Pakistan has been endowed with vast water resources which, if utilised effectively, can provide solutions to two of the country's most pressing concerns: the generation of affordable electricity and the conversion of barren land into productive agricultural zones. Despite possessing these natural endowments, the country's approach toward water resource management has been inconsistent. The construction of the Mangla and Tarbela Dams decades ago set a foundation, but since then, Pakistan has seen little progress in expanding its water infrastructure.

One of the most significant missed opportunities was the Kalabagh Dam project. Due to political controversies and provincial opposition, the project was shelved, despite its potential to become a cornerstone of the nation's water management strategy. Its abandonment has contributed to the ongoing water shortages and reliance on expensive and unsustainable energy sources.

Amidst this backdrop, the Diamer-Bhasha Dam emerges as a beacon of hope. First conceptualised as a key component of Pakistan's water management and energy strategy, the dam's construction began in 2020 under the previous government. However, the decision to hastily begin construction without addressing the crucial aspect of financing has resulted in significant challenges. Initially, the cost of the dam was estimated at Rs479 billion, with Rs120 billion allocated for land acquisition alone. Today, due to delays, mismanagement and lack of foresight, the cost has skyrocketed to Rs1,400 billion. This escalation in expenses reflects a broader pattern of poor planning, where delays in execution and

unnecessary bureaucratic hurdles inflate the cost of critical infrastructure projects.

Despite the financial hurdles, the Diamer-Bhasha Dam remains indispensable to Pakistan's long-term water and food security. The dam, once completed, will not only generate 4,500 megawatts of electricity but will also store an additional 8.1 million acre-feet of water, vital for irrigation and drinking purposes. The dam will be instrumental in managing floodwaters and reducing the risks of future floods that have historically wreaked havoc on Pakistan's agricultural and residential areas. Given the importance of this project, the government has renewed its focus on its completion.

However, the financial challenges of completing such a massive project during an economic crisis cannot be overlooked. Securing the necessary funds for the dam's completion is an enormous task. But the government must prioritise the project in the interest of national development. Delaying it further will only exacerbate the situation, leading to an even greater increase in costs. The dam's long-term benefits far outweigh the immediate financial concerns, as it promises not only energy generation and irrigation but also economic growth through the creation of thousands of jobs.




Presumably, the Diamer-Bhasha Dam stands as a pivotal project for Pakistan's future. It holds the potential to significantly improve the country's water storage capacity, generate affordable electricity and enhance food security. Despite the financial constraints and challenges, the government must take bold steps to ensure its timely completion. Alongside the development of smaller dams, such initiatives can transform Pakistan's water and energy sectors, driving sustainable economic growth and alleviating some of the most critical challenges facing the nation today.



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The writer, a research fellow at the Sustainable Development Policy Institute, has a doctorate in energy economics

The opportunity cost of tapping into Thar coal isn't straightforward. It's not just about digging up the coal and cashing in; it's also about what we give up in the long run by going down that road. Pakistan is standing at a crossroads. We can choose either the short-term boost that coal promises or look beyond that and see a bigger, greener picture.

The idea of leaving fossil fuels in the ground and earning carbon credits instead is now looking like a strategy. Global energy markets and climate policies are evolving.

The choice with regard to Thar coal is between immediate economic benefits and a more sustainable future. Burning the coal limits our

The case of unburnable carbon

chances of participating in the upcoming global carbon markets and avoiding environmental costs of coal extraction and use.

One of the primary opportunity costs of extracting Thar coal is the potential to earn carbon credits by not exploiting this resource. In global climate policy, the concept of "unburnable carbon" has gained traction, suggesting that a significant portion of fossil fuel reserves must remain unextracted to keep global warming within the limits set by the Paris Agreement.

For countries like Pakistan, this presents an opportunity to monetise its fossil fuel reserves without extracting them through mechanisms, such as "avoided emissions" credits. Under this framework, Pakistan could negotiate with international climate finance mechanisms or carbon markets to receive financial compensation for its decision to keep its coal in the ground.

The revenue from such carbon credits

could be invested in renewable energy development, energy efficiency and other sustainable projects, thereby contributing to a more resilient and sustainable energy system.

The potential revenue from carbon credits must be analysed in comparison to the expected economic gains from coal extraction. Thar coal promises a reduction in energy costs and a decrease in reliance on imported fuels. On the other hand, the global price of carbon emissions is increasing steadily.

Under the European Union Emissions Trading System (EU ETS), carbon border adjustment mechanism (CBAM) and other regional carbon markets, the price per tonne of carbon dioxide equivalent (CO₂e) has seen significant growth in recent years.

By leaving the coal in the ground, Pakistan can avoid these externalities, which have tangible economic costs.

Protecting the region's ecosystem, particularly its scarce water resources, will maintain

livelihoods of local communities that rely on agriculture and pastoralism. The societal cost of environmental degradation and water scarcity is often difficult to quantify, but it is clear that preserving these resources holds substantial value for Pakistan's long-term sustainability.

A decision to leave Thar coal unextracted could also align with the evolving global regulatory landscape,

particularly the implementation of the European Union's CBAM. As the EU and other major economies move towards carbon neutrality, they are introducing measures that penalise carbon-intensive imports.

Pakistani industries that rely on coal-fired power for production, such as textiles, cement and steel, could face additional costs when exporting to markets that enforce strict carbon regulations. This can not only reduce the competitiveness of Pakistani exports but also discourage foreign investment in sectors reliant on coal-based energy.

By not developing Thar coal and instead pursuing cleaner energy options, Pakistan can avoid future regulatory and market risks, positioning itself as a producer of low-carbon goods. This could enhance its trade prospects, attract green investment and strengthen its participation in global value chains that prioritise sustainability.

The opportunity cost includes the potential for investing in renewable energy and sustainable development. The funds earmarked for the development of Thar coal infrastructure, including power plants, mining operations and transport, could be redirected towards scaling up renewable energy sources like solar and wind through modernisation of transmission system.

Pakistan has significant renewable energy potential, with high solar irradiance and favourable wind conditions, particularly in the southern regions. Investments in these sectors could provide a sustainable and decentralised energy supply, reducing transmission losses and enhancing energy security.

Renewable energy development aligns with global climate finance initiatives, opening access to international funding sources, including the Green Climate Fund and bilateral climate aid, which often support projects that facilitate transition to low-carbon economies. By focusing on renewable energy, Pakistan could build a diversified energy mix resilient to external shocks, such as fluctuations in fossil fuel prices and geopolitical tensions affecting energy imports.

The strategic choice of not exploiting Thar coal could position Pakistan as a responsible actor in the global climate narrative, potentially leading to diplomatic and economic advantages. As countries around the world ramp up their climate ambitions, Pakistan's decision to forgo coal extraction could enhance its standing in international climate negotiations and partnerships. This could translate into greater influence in multilateral

climate funds, technical assistance and capacity-building support for its sustainable development agenda.

By making a commitment to climate action, Pakistan could also attract multinational companies and investors seeking to invest in countries with strong environmental credentials. A new financing mechanism under consideration is Coal to Clean Credit Initiative.

The CCCI offers a pathway for developing countries to move away from coal without compromising economic growth. According to the Rockefeller Foundation, the CCCI enables these countries to generate jobs and electricity while avoiding a climate crisis.

With more than 90 percent of coal plants locked into long-term, profitable contracts, the CCCI proposes a methodology to accelerate the phase-out of coal by creating coal-to-clean credits. These credits provide financial incentives for plant owners to transition to renewable energy and support communities impacted by the shift.

The initiative aims to start transactions by 2024, helping avoid millions of tonnes of CO₂ emissions. It emphasises a just transition, working with local communities to create new job opportunities and ensure that workers' needs are met.

With partnerships in countries like

Indonesia, the CCCI sets a new benchmark for carbon-financed projects, aligning immediate project-level actions with broader system decarbonisation. By doing so, it opens a practical route for countries to shift from coal to clean energy, driving both environmental and social benefits.

The opportunity cost of exploiting Thar coal is substantial considering the potential benefits of earning carbon credits, avoiding environmental and health externalities and aligning with global climate objectives. While the immediate economic and energy benefits of coal extraction are compelling, the long-term advantages of leaving Thar coal in the ground could outweigh these benefits, once global carbon pricing mechanisms and regulatory frameworks evolve.

The idea of monetising Thar coal reserves through carbon credits offers a pathway for Pakistan to simultaneously achieve climate mitigation goals and promote sustainable development. By reframing its energy strategy to prioritise renewable energy and environmental conservation, Pakistan could mitigate the risks of a carbon-intensive future and embrace a development trajectory that is economically, socially and environmentally sustainable. ■



The Dawn of Pakistan's Renewable Energy Era

Hadla Zaid

The writer is a communications professional

Pakistan is embarking on a transformative journey in its energy sector, spurred by the pressing need to reduce dependence on expensive imported fossil fuels and embrace a more sustainable and cost-effective energy mix. This transition is evident in the nation's increasing focus on renewable energy sources, marking the dawn of a new, greener era.

For years, Pakistan has grappled with chronic energy challenges—skyrocketing electricity costs, power shortages, and an over-reliance on imported fuels, all of which have stifled economic growth and burdened the nation with high energy expenses. However, with abundant natural resources, particularly in solar and wind energy, Pakistan is uniquely positioned to address these issues. The move toward renewables not only promises environmental benefits but also job creation, economic growth, and greater energy security.

Both the government and private sector have acknowledged the need for a more sustainable energy approach. The

focus is now shifting toward harnessing local energy sources such as solar, wind, and hydropower, which are driving Pakistan toward energy independence. This strategy promises to stabilize electricity prices and reduce the country's exposure to volatile global fuel markets. Most importantly, it could ease the financial burden on consumers by making energy more affordable and reliable.

One notable example of this shift is the growing number of solar and wind projects across Pakistan. Leading the charge is K-Electric, one of the country's major power utilities, with plans to integrate 1,300 MW of renewable energy into its power generation mix. A highlight of these efforts is a 150 MW solar project in Balochistan, which has attracted significant investor interest, signaling increasing confidence in Pakistan's renewable energy potential. This project recently set a milestone by securing the lowest-ever tariff bid in the country, with Master Textile Group proposing a rate of PKR 11.2 per unit—an indication of the economic viability of renewable energy investments. Future K-Electric projects include a 270 MW solar project in Sindh and a groundbreaking 220 MW hybrid solar and wind project, the first of its kind in Pakistan.

Meanwhile, the Sindh government

is making strides in the renewable energy sector as well, with its ambitious 550 MW floating solar energy facility at Keenjhar Lake. This project exemplifies Pakistan's commitment to innovative renewable energy solutions and is a part of broader efforts to establish a resilient and sustainable energy infrastructure.

Hydropower also remains a cornerstone of Pakistan's renewable energy portfolio. The Dasu Hydropower Project, set to generate 4,320 MW upon completion, will be one of the largest hydropower projects in the country. This project underscores Pakistan's commitment to diversifying its energy mix by leveraging its full range of natural resources.

These renewable energy efforts are not just about expanding the power grid—they represent a broader commitment to sustainability, economic resilience, and energy security. Pakistan's pivot to renewables aligns with global trends toward reducing carbon emissions and mitigating climate change. By lessening its reliance on imported fossil fuels, the country can sidestep the financial volatility caused by fluctuating global oil and gas prices, while simultaneously driving economic growth through the creation of new industries and employment opportunities.



Although Pakistan's renewable energy transition has made notable progress, it can draw lessons from international examples like Uruguay. Within a decade, Uruguay transformed its energy sector, shifting from dependence on fossil fuels to a renewable energy-based economy through comprehensive policies that incentivized investment, modernized infrastructure, and promoted research and development. By 2021, Uruguay's renewable energy generation exceeded its electricity consumption, positioning it as a global leader in clean energy. Pakistan, while facing its own challenges, can look to Uruguay as a model for the potential success of a long-term renewable energy strategy.

In conclusion, Pakistan's renewable energy push marks the beginning of a new chapter in its energy history. The country's vast solar, wind, and hydropower resources provide a strong foundation for a sustainable energy future. Initiatives like K-Electric's renewable energy expansion and the government's major solar and hydropower projects are critical steps in making renewables a central part of Pakistan's energy strategy.

As these efforts unfold, Pakistan is poised to become a regional leader in renewable energy, offering a blueprint for other developing nations looking to reduce their reliance on fossil fuels and build a more sustainable, affordable, and reliable energy future. ■

Energy Update extends warm Greeting to Stakeholders on Termination of PPAs by five main IPPs

The Energy Update extends its warmest greetings to all relevant stakeholders, especially our esteemed federal government, as we celebrate a significant development in Pakistan's power sector.

We would like to express our heartfelt gratitude to Prime Minister Shehbaz Sharif, Federal Power Minister Awais Ahmed Khan Leghari, Special Assistant to the Prime Minister on Power Muhammad Ali, the former Caretaker Federal Commerce Minister Gohar Ejaz, and SM Tanveer, Patron-in-Chief of the United Business Group of the FPCCI. Your active roles and unwavering commitment to the cause have been pivotal in advancing the discussions surrounding the premature termination of power purchase agreements with the five major independent power producers (IPPs).

The Energy Update welcomes the termination of these agreements as a significant step towards ensuring sustainability and financial viability in Pakistan's power sector. This decision is anticipated to yield a remarkable annual saving of Rs 60 billion for the government, with projections suggesting this figure could escalate to Rs 325 billion over the next three to ten years.

We firmly believe that this move will

lead to a reduction in electricity tariffs for end-consumers, alleviating the economic burden currently being felt by the people of Pakistan, especially during the sweltering summer months when electricity bills have surged. Furthermore, we are optimistic that tariff reductions will facilitate growth and provide substantial relief to Pakistani businesses and industries, thereby strengthening the national economy.

The Energy Update also expresses hope that this positive momentum will encourage additional IPPs to follow suit, rescinding their agreements in the best interest of power consumers and the economic revitalization of Pakistan. We are pleased to acknowledge that this strategic decision is closely aligned with the demands and aspirations of our nation's business community.

Moreover, we are optimistic that this initiative will contribute significantly to resolving the chronic issue of circular debt that has long plagued our power sector.

In conclusion, we extend our heartfelt greetings to the fraternity of Pakistani businessmen and industrialists as we collectively embrace this pivotal moment in our nation's economic journey.

With sincere appreciation and hope for a prosperous future.

Dubai Airports to Launch World's Largest Rooftop Solar Panel Project

In a significant move towards sustainability, Dubai Airports has announced a partnership with Etihad Clean Energy Development Company to launch the world's largest rooftop solar panel project at an airport. The project, slated for completion by 2026, will see the installation of 62,904 solar panels at Dubai International (DXB) and Dubai World Central (DWC). With a capacity of 39MWp, the solar panels are expected to generate 60,346 MWh annually, reducing carbon emissions by 23,000 tonnes each year—the equivalent of removing 5,000 cars from the road or powering 3,000 homes. This clean energy initiative will provide 6.5% of DXB's and 20% of DWC's power needs, furthering Dubai's commitment to sustainable airport operations.



LONGi CONNECT EMPOWERING THE FUTURE



LONGi hosted the 'LONGi Connect - Empowering the Future' tech workshop in Karachi, gathering energy experts to explore the cutting-edge Hi-MO 9 panel with 2nd generation Hybrid Passivated Back Contact (HPBC) technology. Led by Product Expert Zubair Khan, the session provided a detailed overview of this innovation and included an engaging discussion on Pakistan's energy landscape with industry professionals.



LONGi hosted its 2nd 'LONGi Connect - Empowering the Future' tech workshop in Lahore, following a successful event in Karachi. The workshop showcased the groundbreaking Hi-MO 9 panel featuring 2nd generation Hybrid Passivated Back Contact (HPBC) technology. Led by Product Expert Zubair Khan and Country Manager Muhammad Ahsan, the session provided an in-depth look at this innovation. The event also included an interactive discussion on Pakistan's energy landscape with industry professionals.

Officials receives training on integrating carbon markets

EU Report

As signatories to the Paris Agreement have to fulfill their international pledges in their Nationally Determined Contributions by 2030, it is imperative that all policy and financing instruments and international cooperation opportunities be utilized effectively and timely.

Pakistan has set an ambitious target of an overall 50% reduction of its projected emissions by 2030, with a 15% reduction from the country's own resources and another 35% reduction conditional to the provision of international finance. Clean Development Mechanism (CDM) under the

Kyoto Protocol is touted as a "missed opportunity" for Pakistan as the country started too late; the Paris Agreement replaced the Kyoto Protocol in 2016, leading to sharp price and demand declines in international carbon credits from the CDM, and a complete stop of new project approval under the CDM after 2020. Almost 8,000 registered projects under the CDM showcased effectiveness of international carbon markets in mobilizing investments in mitigation activities and generated billions tons of carbon dioxide equivalent of emission reductions.

Thus, under Article 6 of the Paris Agreement, a new generation of international carbon market was created, for voluntary international cooperation and

carbon credit generation and transaction. Pakistan can potentially leverage anywhere between \$2 billion and \$5 billion from carbon markets by 2030 if it properly manages and develops the nascent market, creates a conducive regulatory and policy framework to ensure benefits reach communities affected by the impacts of climate change.

In order to bolster expertise and governmental awareness and will towards strengthening carbon markets in the country, the Supporting Preparedness for Article 6 Cooperation (SPAR6C) programme has held 7 capacity building trainings with relevant government officials and potential project owners and investors since 2022.



HUAWEI

took the limelight at PSW 2024, showcasing groundbreaking solar innovations

EU Report

Huawei FusionSolar, alongside partners AE Power, Bahum Associates, and Diwan International, showcased its cutting-edge solar technology at the Pakistan Sustainability Week (PSW) 2024, held from September 26 to 28 at the Karachi Expo Centre. As the largest sustainability event in the country, PSW 2024 attracted major industry leaders, policymakers, and innovators, all focused on advancing clean energy solutions for Pakistan.

Throughout the three-day event, Huawei DigitalPower Partner's booth became a hub of activity as a large number of visitors, customers, and clean energy enthusiasts engaged with Huawei's team. Attendees were particularly impressed with Huawei's latest innovations in solar energy technology. Visitors took a deep interest in the showcased products, discussing potential applications, product specifications, and integration solutions with the Huawei team and some newly seeing products like Isite power and BESS. As a global leader in smart solar solutions, Huawei FusionSolar sets the standard for innovative solar technologies. Their products combine advanced AI and cloud technologies to deliver high-efficiency, low-maintenance solar systems that meet diverse market needs. At PSW 2024, Huawei showcased its cutting-edge solutions, including the popular SUN2000 Smart String Inverter Series and Smart PV Optimizers, designed to boost energy yields, ensure safety, and provide seamless grid integration.

In addition to their booth, Huawei hosted a Gala Cruise Dinner to honor its partners, Tier-2 Partners and solar industry of Pakistan, fostering collaboration within the energy sector. The well-attended event reflected Huawei's focus on building long-term relationships with key stakeholders, further cementing its leadership in Pakistan's renewable energy market.

Huawei FusionSolar's presence at PSW 2024 underlines the company's role as a driving force behind Pakistan's transition to sustainable energy. As the country looks to renewable solutions for its energy future, Huawei remains at the forefront, providing innovative and reliable solar technologies to meet these growing demands. ■



Wind corridor along Sindh coast blessed with abundance of clean energy

Mohammad Hussain Khan

Mohammad Hussain Khan is a Dawn staffer based in Hyderabad

The exit from the Karachi-Hyderabad M9 motorway at Nooriabad leads one to a narrow road, which connects Thatta's coastal town of Jhimpir to the highway. For the first few kilometres, nothing stands out from the landscape. But if one keeps going, white windmills start coming into view on both sides of the road.

Huge rotor blades mounted on tubular towers make for a surreal sight in this otherwise less-developed part of Sindh. The optics hint towards efforts to produce clean energy. However, one thing that stands out is that only a few of these plants seem to be functional.

Behind the motionless windmills is a tale of infrastructure constraints, administrative bottlenecks and inconsistent policies, which mean that the full potential of wind power remains untapped, leaving investors disillusioned.

There are 36 wind power producers (WPPs) that have set up electricity generation plants along the Gharo-Jhimpir 'wind energy corridor' of Thatta and Jamshoro. These plants, with a combined capacity of around 1,845 megawatts, were installed between 2013 and 2022 under the Renewable Energy Policy 2006.

Wind corridor along Sindh coast boasts abundance of clean energy, but infrastructure and administrative issues mean even installed wind turbines are not running at full capacity.

According to several studies, this 'wind energy corridor' can produce thousands of megawatts of clean energy, since windmills neither run on fuel nor emit any pollutants. Wind power, in the words of a former senior officer of the National Electric Power Regulatory Authority (Neptra), "could rescue the country from the present electricity morass".

The investors who lined up a decade ago to set up WPPs plants for tapping this power generation potential now "feel betrayed" by officials as their plants are mostly shut.

One such investor told Dawn on condition of anonymity that they are regularly "advised" by the National Transmission and Dispatch Company (NTDC) to cut their electricity generation.

NTDC, a federal government entity, is tasked with constructing, maintaining and operating a transmission network and evacuating power from the plants.

The WPP owner had set up his plant in 2019 to

sell electricity to the national grid at Rs14 (or 4.6 US cents) per kilowatt-hour on a “take & pay” contract, where the government only pays for the electricity used in the national grid.

The NTDC’s directive means the plant remains shut for longer durations while administrative and maintenance costs mount without any payment from the government.

Experts have also questioned the NTDC’s advisory as the ‘take and pay’ model of these WPPs can otherwise address one of the biggest issues faced by the power sector — capacity payments.

Independent energy expert Aslam Uqaili says that in the case of wind energy, the government only pays for the power it buys, unlike ‘capacity charges’ and wonders why the government “prefers those plants where capacity charges are to be made irrespective of the power used”.

Infrastructure constraints

Another WPP owner told Dawn that the NTDC does not have transmission infrastructure to evacuate electricity from the wind generator to the national grid.

The investor, who wished to remain anonymous and not risk their relationship with the government, claimed that WPPs can supply 1800MW of electricity to the national grid during summers when the demand is high.

“However, we are told to curtail generation to 1,200MW which is part of around 4,500MW-4800MW of energy produced from coal, nuclear and REs in Sindh,” he adds. As a result, “our plants remain shut even in the April-September period” when electricity demand is at its peak and weather conditions are ideal for producing wind energy.

Dawn reached out to the NTDC spokesperson for comment on the issue, but no response was received despite repeated requests. “We can’t offer any answer. You may write the story as you like” was the response from the company’s media wing.

Mr Uqaili also contends that the transmission infrastructure has problems in evacuating wind energy from Sindh. “When the system doesn’t have capacity, how will the energy be evacuated regardless of NTDC’s commitment to power producers?” asks Mr Uqaili, who is the former vice-chancellor of Mehran University of Engineering and Technology and also served on Hesco’s board.

Another WPP representative accuses government departments of not following up on their commitments. He claims that

when these plants were being established, the power regulator, Nepra, said their tariff would only be approved after confirmation from the NTDC that it would take 100 per cent of the electricity they produced.

According to the WPP representative, the confirmation was provided by NTDC after which Nepra approved their tariff.

“Yet, electricity we can produce is not being fully evacuated to the grid.”

The issue, as per the WPP representative, is because the power generation in the country’s southern region has rapidly increased. “[It] outpaced the development of NTDC’s grids that can carry electricity from south to north. This has resulted in transmission bottlenecks which, in turn, limit NTDC’s ability to evacuate power”.

On its part, NTDC claims the variation in electricity generation from WPPs — due to seasonal changes — makes its grid unstable.

To address this issue, the government has planned to construct a 500kV transmission line to link Matiari in Sindh with Rahim Yar Khan in Punjab.

According to the Ministry of Planning and Development, the Rs189 billion project has been approved, with Rs17bn allocated in the budget for the fiscal year 2024-25.

Mounting liabilities

Liabilities and dues are also a prevalent concern among the WPP owners, who claim that they haven’t even been paid for electricity used in the national grid.

According to one WPP owner, a 50MW wind power plant bills the government Rs2.5 billion for energy sold in four to five months.

The Central Power Purchasing Agency (CPPA) — which purchases electricity from these plants on behalf of the government — usually doesn’t make full payment, and the amount “keeps accumulating”.

He explains that “delayed interest” as per the energy purchase agreements signed with the government are not paid either.

Dawn made several attempts to contact CPPA Chief Executive Officer Rehan

Akhtar for comment. A questionnaire was also sent to him via email, but remained unanswered for a week, until the filing of this report.

Stuck in bottlenecks

While these are the issues faced by investors whose plants have been installed, several other projects have not even reached this stage and are awaiting government approvals.

According to the Sindh Energy Department, at least 27 renewal energy projects, with a cumulative capacity of 1,875MW, are at different stages of approval with the government.

One of the bottlenecks stalling approvals is the inconsistent policies of subsequent governments.

Five of these projects — with a combined capacity of 275MW — were approved under the 2006 policy. However, the PTI government, which came into power in 2018, asked the investors to participate in an open bidding process before their tariff could be notified.

The ‘one-time competitive’ bidding was introduced by the PTI government in its Alternative Renewable Energy Policy (ARE) 2019, much later than the projects were first approved, a Sindh Energy department official said.

Mustafa Abdullah, the chief executive officer of Moro Power, one of the five stalled projects, says a big problem with ARE 2019 is the “unrealistically low tariffs”.

“No investor will invest at a tariff lower than 5.5 US cents per kilowatt hour,” he says, arguing that the policy “discourages” investment. According to him, the government plans to add 1,000MW of wind electricity to the national grid by 2030, but given the persistent issues, “this target will be very difficult to achieve”. ■



UPCOMING COP-29

Govt urged to strongly advocate Pakistan's climate emergency case

EU Report

The federal government has been urged to emphatically present Pakistan's case for serious climate vulnerability at the upcoming COP-29 summit to secure maximum international support to compensate for the massive damages to the country due to the environmental emergency.

The unanimous resolve to this effect was expressed by the participants of a seminar on the upcoming UN Annual Climate Change Summit to be held in Baku, Azerbaijan, from November 11 to November 22, 2024.

The Central Standing Committee on SDGs goals of the Federation of Pakistan Chambers of Commerce & Industries convened the seminar at the FPCCI office in Islamabad.

In his keynote speech, former chairman National Electric Power Regulatory Authority, Tauseef H Farooqi, urged the government to urgently update its climate change policies because of the fast-evolving environmental situation.

He said the worsening environmental challenge and extensive use of artificial intelligence and other latest technologies as an effective defence mechanism required an urgent revision of Pakistan's climate change strategy.

He told the audience that recent tor-



rential rains and flash floods had damaged and threatened hydropower stations in the hilly north of the country.

former NEPRA Chairman praised the widespread use of solar power by domestic, commercial, and industrial consumers as an effective means to reduce the carbon footprint of Pakistan's energy sector.

He told the audience that during his tenure as the NEPRA chief, he had fulfilled the commitment that no licence should be granted for setting up a new power plant based on fossil or imported fuels to promote renewable and indigenous sources of electricity.

Managing Director of the Private Power Infrastructure Board (PPIB), Shahjahan Mirza reiterated the resolve of the PPIB to phenomenally reduce the carbon footprint of Pakistan's energy sector by helping to set up new renewable power projects.

He said the PPIB would extend its fullest support to the government to help Pakistan achieve its clean energy targets in the next six years. He said the PPIB had also been extending support to the private sector power plants to maximally reduce their carbon emissions.

Ammar Jaffri, representing the SDGs Academy in Islamabad, said the government should financially support environmental activists from the non-governmental sector working hard to lessen Pakistan's climate vulnerability.

He warned that the government should adopt climate protection measures on a war footing to protect tourist resorts in hilly areas whose survival had been endangered due to worsening environmental conditions.

Chairman Coordination Malik Sohail said the government should use the latest



AI-based technologies to beef up its fight against climate emergencies.

Ayesha Khan, a development economist, suggested that funding from international donor agencies should be available to step up the climate mitigation measures by the private sector in Pakistan.

Convener of the Standing Committee on SGDs, Naeem Qureshi, urged the federal government to fully devolve the subject of environmental protection and climate change to the provinces as per the Constitution.

He said the recommendations of the seminar would be shared with the Ministry of Climate Change to ensure that the government effectively presents its case of environmental emergency at the COP-29.

Dr. Basharat Hasan, CEO of NAMF, a US-based 501-C3 organization dedicated to alternative energy, climate change, and sustainable cities development, presented a compelling case for Pakistan's urgent climate action. During his presentation, Dr. Basharat emphasized the devastating impact of methane emissions, stating that methane is 85 times more damaging to the environment than carbon dioxide.

Dr. Basharat stressed that Pakistan must prioritize the conversion of its millions of gallons of wastewater and industrial effluent, as well as thousands of tons of municipal waste generated daily into electricity, gas, fertilizer, and recycled water. In his closing remarks, the FPCCI Vice-President, Tariq Khan Jadoon assured the fullest support of the federation to the concerned NGOs and environmental activists in their drive against harmful industrial emissions and pollution.

He said the federation was ready to act as a bridge between the government and concerned NGOs to adopt an effective strategy against the worsening problem of environmental degradation in the country. ■

Addicted to gas

Lukas Hammer

Europe is the biggest market for US fracked gas exports. This fracked gas is liquefied – turned into LNG – and then shipped to the EU's shores. Once regasified it runs in pipelines to fuel industry processes or heat homes or food. While it was enthusiastically titled "Freedom Gas" in 2019, when the EU-US LNG deal was forged, more and more Europeans realize today that this gas comes with a very bitter aftertaste, concerning both our planet's climate and the environment as well as human rights and the health of impacted communities.

This spring, I had the opportunity to meet Corpus Christi and Southern Louisiana inhabitants and learn firsthand about the devastating impact that the LNG industry, on top of all other polluting industries impacting the community, has on people and their health, water, air, and livelihoods.

Industry operations in petrochemical and LNG export locations in the US Gulf Coast are linked with heart, lung, and kidney diseases; significantly lower life expectancy; water and air pollution; loss of biodiversity; and structural human rights violations as well as structural environmental racism. It becomes more and more clear to any remotely responsible energy user that all this is what Europeans are importing when they import LNG, molecule by molecule, vessel by vessel.

The US Gulf Coast is not only hit by reckless fossil fuel industry activities, but also regularly hit by major hurricanes – and finds itself in the middle of an active hurricane season right now. Increasingly damaging hurricanes are only one of many consequences of the climate crisis.

We all experience one heat record after another, floods, droughts, and the world has probably surpassed the 1.5°C threshold already. LNG is fossil methane and has a global warming potential over 100 times higher than that of carbon dioxide in the next crucial decade. LNG leaks methane all along the supply chain.

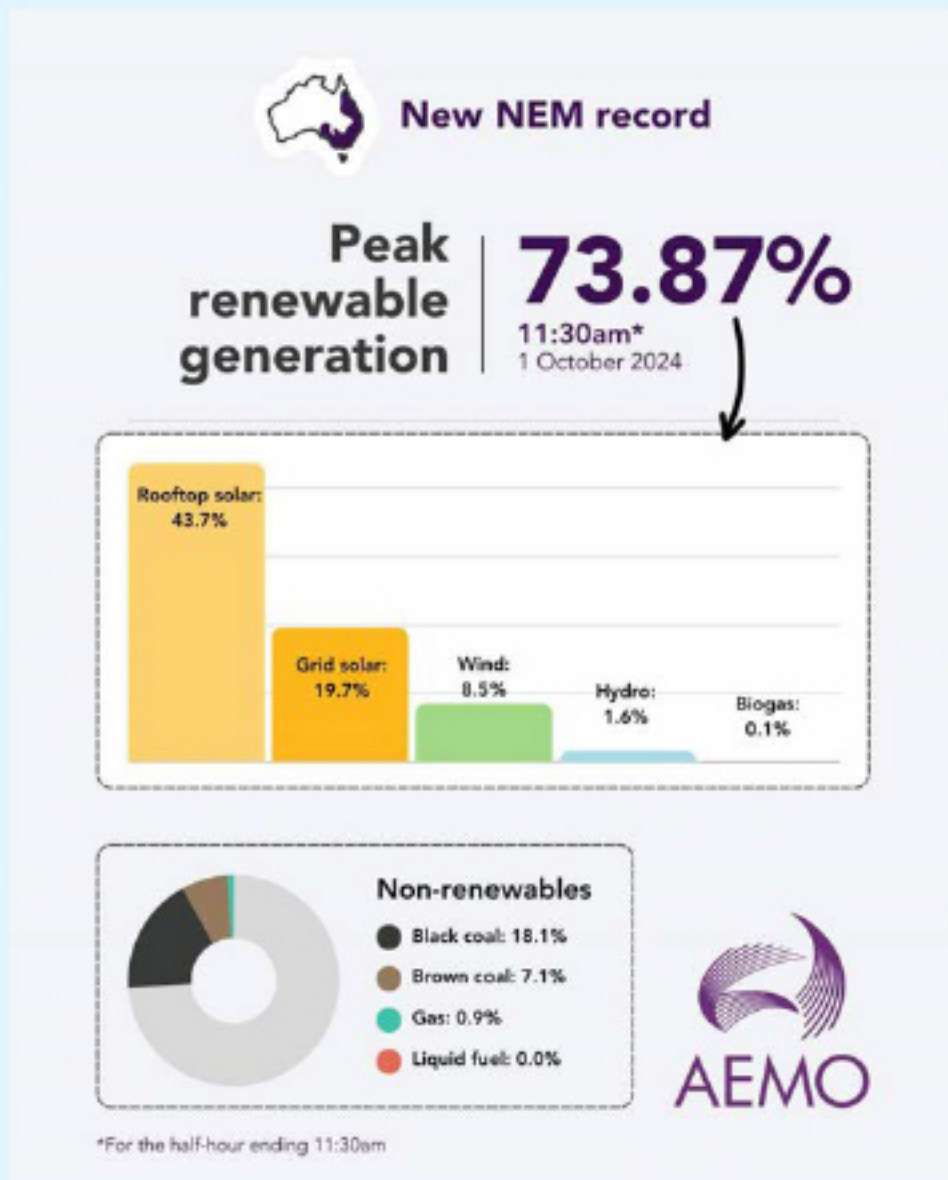
This should be shocking for any European – and American – to hear, given in the past two years, Europe swallowed over 60% of all LNG that the US exported. After Europe has been scrambling to get off Russian gas, US LNG made up for over 46% of the gas in the EU in 2023, and almost all of it is fracked-making the LNG's climate impact even worse.

Now there are gigantic further LNG plans in the making: Massive LNG export capacity increases are planned in the Gulf Coast. But even notwithstanding the fact that people and the planet can't afford even more LNG, this buildout does not make sense:

The EU's gas demand has already decreased by 20%, and will decrease further if we take our climate commitments seriously. Austria's fossil gas demand has decreased by 25% since the Russian invasion of Ukraine. However, we are still heavily dependent on Russian gas. In March of 2024, 93% of our gas imports came from Russia – and this too is a shocking truth.

Excerpted: 'No, Europe Doesn't Need US LNG'. ■

Courtesy: Commondreams.org



Country's energy woes: socio-economic life crippled

Shahid Sattar | Syed Absar All
Fatima Aamir

Energy sector issues risk further deepening Pakistan's socio-economic divides; Energy prices surges to unsustainable levels, affecting every segment of society

Energy sector issues risk further deepening Pakistan's socio-economic divides as recent years have witnessed an unprecedented surge in energy prices, stretching consumer pockets beyond capacity.

Energy prices in Pakistan have surged to unsustainable levels, affecting every segment of society. Households are being forced to make difficult choices, cutting down on essentials like health and education just to afford their utility bills. Despite the burdensome tariffs, the government has failed to contain the energy sector's circular debt, now exceeding Rs. 5 trillion.

In a country where public services like education, healthcare, and social safety nets are already inadequate, higher energy expenditures further impoverish households. There are numerous reports of families selling household appliances or taking children—especially girls—out of school only to keep up with electricity bills. As the share of income spent on energy rises, the financial strain becomes unbearable, with significant social implications.

To understand how energy prices have affected living standards, we look at the evolution of the share of household expenditure on electricity and gas. Expenditure on energy as a share of household income has increased signifi-

cantly across all income levels, with the highest income quintiles nearly doubling their share. But the second quintile—those struggling but not considered “poor enough” to receive government support—has seen the steepest increase, from 4.2% in 2019 to 9.7% in 2024.

Almost all households have been forced to make trade-offs that significantly lower their welfare, leaving them trapped between falling living standards and rising prices.

On average, households in Pakistan are spending greater parts of their incomes in the way of energy than most advanced economies (Figure 3, below) and, consequently, are maintaining much lower standards of living. This disparity is attributable not only to higher energy tariffs but also to lower levels of income compared to other economies.

Nepra's 2023 State of Industry Report shows a 49% increase in net-metering consumers, from 37,769 in June 2022 to 56,427 in June 2023, with electricity exports from these connections growing by a whopping 220% during the same period. The incidence of off-grid solar is likely many times larger, but not captured in the data.



As more households switch to solar, the per unit burden of stranded capacity payments increases and those still reliant on the national grid face even higher prices. This dynamic threatens the financial stability of the energy sector as the government's and cross-subsidizing consumers' subsidy burden grows beyond what they can afford. Of the 29 million residential power consumers, around 17 million fall under the "protected" categories, accounting for ~30% of power sector demand but only contributing 12.6% of revenue. Residential ToU consumers, on the other hand, contribute 8.3% to power revenue with only of 5.5% in demand.

The persistent cycle of rising subsidy costs stems from a misalignment between the tariff structure and market dynamics. Designed to curb electricity consumption through higher rates for higher consumption, it made sense when demand for electricity exceeded its supply. However, with significant expansions in generation capacity, Pakistan has moved well beyond its supply-side constraints.

As a result, maintaining an incremental slab-wise tariff system focused on limiting usage is economically outdated and ill-suited to the present energy landscape. Constraining electricity demand despite ample supply leads to unsustainable stranded capacity costs and insufficient revenue to cover these payments,

accumulating circular debt. The glaring disconnect between current policies and the evolving needs of the power sector raises a critical question: why is the government failing to recognize and apply basic economic principles?

The gas sector tells a similar story of mismanagement. Once abundant, Pakistan's domestic gas supplies are near depletion due to economic distortions discouraging investment in domestic exploration and production (E&P). The government prioritizes payments for expensive LNG imports over domestic producers, depriving them of working and investment capital and building Rs. 2.7 tr of circular debt in the gas sector.

As in the power sector, the government attempts to mitigate the impact of the gas sector inefficiencies through an incremental slab-wise tariff that cross-subsidizes tariffs for supposedly lower-income consumers with lower levels of consumption through higher rates charged to high consumption consumers.

While domestic gas prices were once linked to crude, in 2006 the government established a ceiling price, effectively delinking them from oil and causing producers to lose out on significant revenue when oil prices rose sharply in 2008. When gas was made a tool for exerting political influence, the ensuing distortions left no incentives to invest in domestic E&P and no significant gas

discoveries were made as a result, causing the country to rely increasingly on imported LNG.

Decades of poor planning and mismanagement have brought Pakistan's energy sector to the brink of collapse, yet policymakers are failing to implement effective reforms. Pakistan's energy strategy is devoid of sound economic rationale and fails to achieve the primary objective of improving economic conditions.

The current policy to cut gas supply to captive power plants is the latest in a series of missteps and conflicts with the government's goal of economic stability. By forcing industries to depend on a prohibitively expensive national electricity grid, the policy will cause them to either shut down or drive them towards other sources of energy, lowering their cost-efficiency, profitability, and capacity for innovation.

By transitioning residential consumers to electricity and LPG, natural gas can be redirected to industrial sectors that contribute to long-term productive capacity, ensuring sustainable growth and resource efficiency for future generations.

Realizing this demands nothing less than a radical shift in policy—one that redefines priorities, focusing on the economy's productive capabilities, and placing productivity and sustainability at the heart of decision-making instead of relying on short-term pacifying measures. ■

ENERGY UPDATE

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HOPEWIND

teams up with Energy Update for sustainable energy solutions

Syed Faizan Ali Shah says solar industry must anticipate increase in exports from net-metered systems

Amer Malk

Prime Minister's Pakistan Solarization Committee Member, Engr Syed Faizan Ali Shah has outlined major challenges for the solar industry as more and more distributed solar gets inducted into the distributed grid.

"The solar industry must anticipate increase in exports from net-metered systems during shoulder months due to expansion of distributed solar," he said while addressing a seminar on "Sustainable Energy Solutions – Achieving Net-Zero Targets", organized by Shenzhen Hopewind Electric in collaboration with Energy Update – a magazine dedicated to energy, in Lahore.

Faizan Ali Shah indicates decrease in minimum operational load of the grid. Some areas are highly concentrated while grids in other areas are comparatively free. Furthermore, he said that various issues



Syed Salman Mohiuddin Regional Head Hopewind Pakistan and UAE addressing on this occasion.

such as reverse power flow, over-voltages, harmonics, low reactive power, power quality issues, power curtailments, higher peak demand year-on-year and tariff increase will crop up.

He informed that the solar PV market has grown over the years due to rising electricity prices and lowering prices of solar PV modules. Besides, the lucrative distributed generation regulation in favor of consumers along with increasing buy-back rates and decreasing pay back periods have contributed to solarization in the country.

On industrial side, he said, there

are no red-tapism resulting in no import restrictions on solar panels and inverters, while additionally, the tax breaks and zero custom duties also promoted the solar sector in the country.

Due to conducive environment, he said, the utility scale solar generated 780MW, while distributed solar produced 2700MW excluding K-Electric generation of 600MW. Besides, there is captive solar power generation capacity of 2000 to 3000 MW. "The solar industry has witnessed increased imports of inverter and solar panel equivalent of 13GW this year. It created good business opportunities,



Faizan Ali Shah presenting memento to Aafaq Ali Khan Member Pakistan Solar Association



Faizan Ali Shah presenting memento to Mariam Khalid from PEECA



From L to R Mariam Khalid from PEECA, Syed M. Raza Zaidi Country Manager Technical Hopewind, Aafaaq Ali Khan Executive Member PSA and Syed Faizan Ali Shah Member Prime Minister Solarization Committee addressing on the occasion.

promoted self-generation and export to grid,” he added.

The solar industry also has its share of challenges because to imposition of ban on utility scale solar and imports of solar panel in 2018, Besides there were issues of licensing & certification, pricing, net-metering, import of low quality materials and Covid panedemic.

In order to combat the challenges to the solar sector, Faizan Ali Shah underscored the importance of advancement in distribution grid through digitization of the distribution network i.e. transformer monitoring, consumer’s smart monitoring, SCADA systems to monitor & control the flow of power as well as optimizing weather forecasting systems.

The change in regulations with a view to encouraging self-consumption, incentivizing use of batteries, encouraging smart inverters and incentivizing consumers for grid management can help combat the challenges.

The residential batteries can also store excess energy, which can be drained during peak hours to reduce stress on the grid. It will help reduce peak demand and provide stability to the grid. “The batteries are source of energy security and independence,” he said, and also emphasized using

smart Inverters.

The solar fraternity can also help mitigate the challenges to the solar sector by encouraging consumers to install solar panels as per regulations, keep inverter voltage settings within the acceptable range, support utility in monitoring the solar PV installed systems, channelize solar procurements and pricing of solar products.

Syed Salman Mohiuddin, Regional Head, Hopewind, Pakistan and UAE, said that Shenzhen Hopewind Electric, established in 2007 by industry experts, has cumulative shipment volume of new energy exceeds 150GW+.

Over the last decade, he said, Hopewind has been continuously making breakthrough in technology and innovation, taking part in the drafting of national, industry or even international standards, contributing to the development of industries. The company covers wind power, PV power, ESS, Hydrogen power, SVG and electrical drives.

He said that the company’s output volume & sales turnover rank among top 05 in domestic market and ranks among Tier-1 solar inverters according to BloombergNEF. “The company has always adhered to innovation and progress. We are the world’s first successful on-grid



Syed Salman Mohiuddin presenting memento to Faizan Ali Shah

distributed inverter manufacturer based on cutting-edge technology and deliver on a large scale,” he added.

Mariam Khalid from Punjab Energy Efficiency and Conservation Agency (PEECA) urged energy experts to come forward and guide the government to make best use of the sustainable energy solutions.

Aafaaq Ali Khan, Executive Member, Pakistan Solar Association (PSA), forecasts difficult time as so many challenges will be faced by the energy sector in the future. However, he believed that the renewable energy sector will come out of these challenges successfully by dint of its resilience. For instance, he said, when on-grid system will choke, the people will automatically shift to batteries, and the solar system will sustain itself.

Besides, Syed M. Raza Zaidi, Country Manager Technical, Hopewind Pakistan also spoke on the occasion.

Later, mementos were distributed among the government officials and renewable energy experts. ■



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Feroze Power, Maysun to set up solar panel production unit



Engr. Nadeem Ashraf

Feroze Power (Pvt) Ltd has signed a memorandum of understanding with Maysun Solar to establish a solar panel production plant in Karachi.

This initiative aims to boost local production of clean energy equipment in Pakistan and increase renewable power generation while minimizing the impact on the country's foreign currency reserves.

"One of the main objectives is to ensure the necessary transfer of technology for indigenous production of renewable energy equipment as a major step towards Pakistan achieving the stage of self-reliance in the power sector," said FPL Chief Executive Officer, Sohail Feroze after signing the MoU. FPL Chief Operating Officer, Abdul Mateen Qureshi, said the solar manufacturing unit to be set up in any of the exclusive economic zones in or nearby Karachi would initially have an annual

production capacity of 300 megawatts. He informed the audience that in the later stages, the production capacity of the plant would be scaled up to 1.2 gigawatts. Qureshi said that earlier FPL, as a leading EPC contractor in the Pakistani clean energy market, had helped several leading organisations in different sectors, including IBA, Karachi, and Hubco to set up solar systems to ensure maximum reliance on renewable power for energizing their core operations. ■

Sustainability Investment Expo & Conference 2024 Set for Nov 5-7



Energy Update and SDPI announce the Sustainability Investment Expo & Sustainable Development Conference 2024. The event aims to bring together stakeholders from public and private sectors, academia, and media to promote sustainable development. An awards program will recognize innovative ideas and exemplary efforts in sustainability. Nominations invited from organizations across various categories. ■

Energy Update expresses deepest condolence to China for loss of Chinese nationals in Karachi attack

The Energy Update expressed its deepest condolences to the government and affected families from the People's Republic of China for the loss of two precious lives of Chinese nationals and injuries to another Chinese in the gruesome terror attack near Karachi Airport on the night of October 6, 2024.

In its condolence message, Energy Update Managing Editor, Muhammad Naeem Qureshi, vehemently condemned the terror attack on the convoy transporting the Chinese employees of the Port Qasim Electric Power Company after their arrival at the Karachi Airport.

He said the attack on the

Chinese nationals working on power generation projects in the country was tantamount to attacking Pakistan's energy security.

He called upon the government to provide foolproof security to Pakistani and Chinese nationals engaged in energy sector initiatives, development, and infrastructure projects.

He said the government needed to ensure stringent security measures for the Chinese nationals working for the progress, development, and energy security of Pakistan. Mr Qureshi said that Chinese nationals serving in Pakistan deserved comprehensive security cover for their complete safety. ■



Karachi shines as Pakistan Sustainability Week and Solar Pakistan Drives Country's Bold Leap Towards a Sustainable Future



ic growth while confronting the challenges of climate change.'

Mr. Saleem Khan Tanoli, CEO of Fakt Exhibitions, expressed his satisfaction with the event's outcome. PSW has been a transformative platform for Pakistan's energy landscape, bringing together global innovators to showcase the latest technologies in clean energy. This exhibition reflects our collective ambition to shape a sustainable future.

The event was attended by notable government figures, including Senior Minister Mr. Sharjeel Inam Memon, Energy Minister Syed Nasir Hussain Shah, Minister for Industries & Commerce Jam Ikramullah Dharejo, and Secretary Energy Mr. Musaddiq Ahmed Khan. Their presence underscored the government's commitment to supporting alternative energy initiatives.

On the second day of the event, Fakt Exhibitions hosted a gala dinner and cultural show to recognize and celebrate the achievements of the alternative energy industry. The event honored industry leaders for their innovative contributions and unwavering commitment to advancing

EU Report

Pakistan Sustainability Week (PSW) alongside Solar Pakistan concluded successfully at the Karachi Expo Centre. Organized by Fakt Exhibitions (Pvt.) Ltd., the largest sustainability and clean energy technology event attracted major industry leaders, policymakers, investors, manufac-

turers, and suppliers, marking a significant milestone in Pakistan's journey toward alternative energy solutions.

The event was inaugurated by Governor Sindh, Mr. Muhammad Kamran Khan Tessori, who emphasized the critical role of such events in addressing climate change and promoting eco-friendly solutions. He praised PSW for fostering collaboration and innovation, stating, "Through joint initiatives, we can open pathways for econom-





alternative energy solutions.

With participation from over 200 global companies across 10 countries, the event showcased a wide range of advanced technologies aimed at enhancing energy efficiency and sustainability in Pakistan. The three-day exhibition provided a dynamic platform for knowledge exchange, networking, and collaboration, significantly elevating the alternative energy sector in the country.

PSW set a new benchmark for future energy-related events, highlighting the importance of alternative energy solutions and reaffirming Pakistan's commitment to a greener future. ■



ENERGY NEWS

Pakistan emerges as second largest market for Chinese solar products

EU Report

Pakistan has emerged as a significant new market for Chinese photovoltaic (PV) companies, aligning with its shift towards energy transformation.

According to data from the China Photovoltaic Industry Association (CPIA), in the first half of 2024, Asia surpassed Europe as the largest export destination for PV products, with Pakistan becoming the second-largest market for module exports after Europe.

During this period, China exported a total of 1.714 billion RMB worth of inverters to Pakistan. In August alone, the export value of inverters to Pakistan reached 326 million RMB, reflecting a year-on-year increase of 429.04%. The shiny blue panels are now installed on a wide array of factories, homes, hospitals, and mosques.

As reported by China Economic Net, the increase in exports of photovoltaic and auxiliary products reflects Pakistan's urgency to transition towards new energy production amidst rising electricity prices. "People are trying to find their own way," said Abbas, a Pakistani trader, at an investment and trade forum focused on cooperation between eastern and western China.

As of June 2023, Pakistan had an installed solar energy capacity of 630 megawatts, which constitutes only 1.4% of the total installed power capacity, indicating significant room for improvement. ■

Denmark to aid in green energy transition

EU Report

Denmark's Ambassador Jakob Linulf on Tuesday discussed the assistance required by Pakistan for transition to green energy, building climate resilience, water conservation and biodiversity protection.

At a meeting with Coordinator to Prime Minister on Climate Change Romina Khurshid Alam, the Danish envoy highlighted his country's extensive experience in renewable energy and sustainable practices.

He emphasised the potential for knowledge sharing and technology transfer to Pakistan to achieve environmental sustainability and climate resilience goals.

He also underscored the ongoing and future collaborative initiatives aimed at tackling climate change challenges facing both the nations.



Greaves Pakistan showcases innovative energy solutions at exhibition



EU Report

Greaves Pakistan, a company of Ghulam Faruque Group, and a well-established name in the energy sector, recently participated in the Solar Pakistan exhibition, held from September 26th to 28th, where it showcased its diverse range of innovative energy solutions.

The company showcased a wide range of products, featuring solar panels, inverters, Battery Energy Storage Systems (BESS), Gensets, and Uninterruptible Power Supply (UPS) systems. The event gathered top brands, leading solution providers, consultants, and professionals from across the industry.

Greaves Solar is a strategic renewable energy division of Greaves Pakistan Private Limited and offers state-of-the-art on-grid, off-grid and hybrid solar solutions tailored for large-scale industrial facilities, commercial projects, residential and agricultural facilities nationwide.

The company also offers Battery Energy Storage Systems (BESS) to meet the growing demand for efficient and reliable energy storage. Designed for high efficiency and minimal energy loss, BESS ensures optimal performance and cost savings. Over the past decade, Greaves Solar has installed and distributed solar solutions and equipment with a cumulative generation capacity of more than 250 MW countrywide. Feroze 1888, IFFCO Pakistan (Pvt) Ltd, Mehran Plastic Indus-

tries (Pvt.) Ltd., Naveena Steel Mills are few among the remarkable installations by Greaves Solar in Pakistan.

A part from solar energy solutions, Greaves' diversified product portfolio includes generating sets (KOHLER), UPS (Eaton), vertical transportation solutions (OTIS), compressors (Worthington and Gardner Denver), pumping systems (Ebara), efficient wastewater management solutions (Miranda and EPSE), road construction machinery (Dynapac), earth moving equipment (XCMG & Belaz), Material handling equipment (Lonking), steam turbines (Howden), petroleum & refueling products (Dover Fueling Solutions and Liquid Controls), oil storage and depot equipment automation (Emerson).





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Striking oil — a crude endeavor

Syed Rashid Husain

Pakistan's primary challenge is not a lack of oil assets but rather how to bring them out from underground

Is Pakistan the new kid on the global energy map? If recent reports are to be believed, this could be the case.

Over the last few weeks, local and international media have reported a “massive” oil and gas find in the offshore territory of Pakistan. According to some estimates, the find could be the “fourth largest” oil and gas reserve in the world. That would be a game-changer in more than one way.

Today, Venezuela has the largest amount of oil reserves, with over 300 billion barrels of crude oil, followed by Saudi Arabia, Iran, Canada, and Iraq. The United States is believed to have the most untapped shale oil reserves. Several other countries, including Pakistan, as reported by the US Energy Information Agency several years ago, also have a considerable amount of untapped shale oil and gas resources, mostly in Balochistan.

But, for Pakistan to extract them, particularly given the investment required to unearth the asset and the prevailing security situation in the province, seems difficult, if not impossible.

The result of the recent find was made public after a three-year, extensive geological survey conducted in partnership with an “allied nation”. Who that ally is has not been revealed officially and is a matter of speculation. However, there are some indications that it could be Saudi Aramco.

The survey results confirmed the presence of massive resources in Pakistani territory, reports said, quoting a senior official. The survey reportedly also pinpointed the exact location of the deposits.

What is interesting to note here is that in March 2019, Imran Khan, the then-prime minister, announced a possible massive find in the offshore territory of Pakistan. The possible find was even tipped by some as “Asia’s largest oil and gas reserve”.

However, the announcement did not turn into a reality, and Mr Khan had to chew his words. Hours after former prime minister Imran Khan announced that there was a chance of discovering “massive reserves at the site by next week”, the Petroleum Division denied it, saying the drill did not yield the desired results.

“ExxonMobil, ENI, PPL [Pakistan Petroleum Limited], and OGDC [Oil & Gas Development Company Limited] were conducting the drill at Kekra-1. More than 5,500-metre-deep drilling was conducted, but oil and gas reserves were not found. The drilling work has now been abandoned,” an official then told DawnNewsTV.



Cnergyico buy Black Sea CPC Blend

Monitoring Report

Pakistan's oil refiner company Cnergyico has purchased Black Sea CPC Blend. CPC Blend is a light grade of oil from Kazakh and Russian producers which is loaded for export from Russia's Black Sea port of Yuzhnaya Ozereyevka.

The Cnergyico refinery in Balochistan tends to be more entrepreneurial with its feedstock, mixing cargoes from the UAE and Russia.

In hindsight, it seems the announcement was made in haste, apparently for political reasons. Now, it appears that not all hopes were dashed then. In 2021, while Imran Khan's government was still at the helm in Islamabad, a renewed effort was initiated to pinpoint the presence of the asset in the territorial waters of Pakistan, with the help of an "allied nation".

The earlier effort seems to be bearing fruit after three years of extensive surveys. A senior, unnamed Pakistani official was quoted in media as saying that the find was an opportunity to capitalise on the "blue water economy", adding that proposals for bidding and exploration are under consideration, which could lead to the commencement of exploration activities soon. But would Pakistan be able to capitalise on this opportunity? Analysts, quoted in media, are of the view that it would take years before the country could be able to exploit the newfound assets, adding that exploration alone required a hefty investment of around \$5bn and that it might take four to five years to extract reserves from the offshore location.

And then despite the news, oil majors do not seem to be rushing over to obtain a piece of the cake, Alex Kimani said in his recent piece in Oilprice.com. In recent years, oil majors — Total, Shell, and Eni — have exited Pakistan on one pretext or the other. Security remains a major concern.

In July, Petroleum Minister Musadik Malik told a parliamentary committee that oil majors were not very interested in offshore oil and gas exploration in Pakistan. It comes down to security and risk versus reward, Mr Malik told the committee, emphasising that the cost of security is a major deal-breaker because "in areas where companies search for oil and gas, they have to spend a significant amount to maintain security for their employees and assets". And the security that is provided by Pakistan has not been up to the task.

The number of attacks on Chinese

engineers and other personnel involved in projects in Pakistan is enough to indicate the intensity of the security issue. The recent attack on the convoy of diplomats returning from the Swat district, killing at least one police officer and injuring several others, is another reminder of the prevailing security situation in parts of Pakistan.

How Pakistan handles the situation remains to be seen. Given the situation on the ground, the task is formidable. Again, the issue is not a lack of assets beneath the surface but rather how to bring out the assets from beneath the ground.

Oil pundits have long been divided on the issue. Some, like the late Matthew Simmons, have been insisting for decades now that oil is a finite product and that the world would run out of it sooner rather than later.

Others, like this correspondent, have been convinced for decades that there is no lack of resources beneath the surface. The real issues are above the surface. Geopolitics and conditions above the ground are largely hindering the process of bringing out this prized asset from under the ground.

Over the last couple of decades, new oil frontiers have emerged on the global energy map. Many insist that Iraq's crude potential has not been exploited to capacity. The UAE crude asset base has also gone up considerably over the last several years. Angola, a comparatively new find, is now showcasing its comparatively large asset base, and Pakistan seems to be the new addition to the global energy map.

The United States and the development of the shale industry in the country have turned the geopolitical tide in many ways. Today, the US, not Saudi Arabia or Russia, is the world's largest oil producer. On the geopolitical chess board, the Organisation of Petroleum Exporting Countries is no longer the sole arbiter of the global energy dynamics. The energy world has undergone a true metamorphosis.

Courtesy Dawn

A pensioner received a letter from the branch manager of his bank branch stating:
"Thanks for promptly submitting this year's "Life Certificate". But, sorry to inform you that we have lost your last year's "Life Certificate" in our record, and the Bank's Inspector has pointed it out in his report. Please submit a certified copy of the same if available with you. Alternatively, submit a declaration that you were alive last year also.

Pensioner's Reply

Dear Sir,
Thank you very much for your acknowledgement of my this year's "Life Certificate". I'm equally sorry to inform you that I do not have any copy of my last year's "Life Certificate". I'm also not in a position to furnish any declaration regarding last year because of my bad memory, despite trying hard, I'm not able to recollect as to whether I was alive last year or not. The inconvenience caused in this regard is deeply regretted.
Regards.



Sindh rolls out plans to enhance clean energy output: Qazi

Mustafa Tahir

The Sindh government has started rolling out its plan to ensure the maximum involvement of private solar power companies to tap the massive renewable energy potential of the province for electricity supplied to residential and industrial consumers in urban areas at the most affordable rates.

Director Sindh Solar Energy Project, Mehfooz A Qazi, stated this while speaking at a seminar on "Future-ready solar solutions" organised by Growatt here at a hotel.

Qazi told the audience that the Sindh Electric Power Regulatory Authority was being established to introduce a "B2B" regime for maximum private sector involvement to enhance clean energy production for the benefit of mainly industrial consumers in the province.

He said the Sindh government had reserved 2200 acres of land in Jhimpir to produce 350 megawatts of clean electricity under its plan to build solar-wind hybrid energy projects in the province. This clean electricity will be supplied to industries by the private sector under B2B arrangements.

"The per unit price of this clean electricity for the industries will be Rs 12 to Rs 13 with an addition of Rs 4 as the transmission cost for supplying power to the industries," said Qazi. He informed the audience that the Sindh government had increased its annual budgetary allocation from Rs two billion to Rs 12 billion to R 14 billion to maximally take advantage of solar clean energy potential to supply electricity at the lowest cost to underprivileged consumers in urban centres and off-grid homes in faraway rural areas.

He said the soaring electricity prices



Group Photo of Chief Guest and Speakers with team Growatt. Team Energy Update also seen in the picture



Group photo of participants with Country Director Growatt Mian Fahad and his team.



From L to R Director Sindh Solar Energy Project Engr. Mehfooz Qazi, Convenor FPCCI Energy Committee Malik Khuda Buksh, Country Director Growatt Mian Fahad and Marketing Manager Growatt Hassam Aziz addressing on the occasion.

for the consumers in the country was one of the biggest challenges of the energy sector in the present era, and the solution lies with maximum utilisation of clean power sources. "Some 15 years back, the per unit price of solar power was Rs 50 with thermal energy available at merely Rs 5, while today the solar power cost has reduced to just Rs 10 to 12 per unit while fossil fuel-based electricity is sold at Rs 50 to Rs 60 per kWh," he said.

He said the private clean energy companies had a vast involvement in the Sindh Solar Energy Project being rolled out in the province with assistance from the World Bank that envisages utility-scale solar parks of 400 MWs generation capacity mainly to benefit power consumers in Karachi.

He assured the fullest support on behalf of the Sindh government to the private solar power companies that aimed to provide maximum relief to residential and industrial consumers by curtailing their electricity bills. Convenor of FPCCI's Standing Committee on Energy, Malik Khuda Bakhsh, told the audience that the industries and businesses in Pakistan required the fullest assistance from clean power companies to slash their heightened

energy bills to ensure their survival. He said the industries were in desperate search of electricity at reduced rates for their continuous operations to improve the economic situation in the country.

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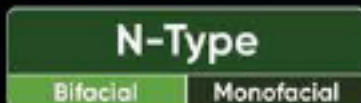
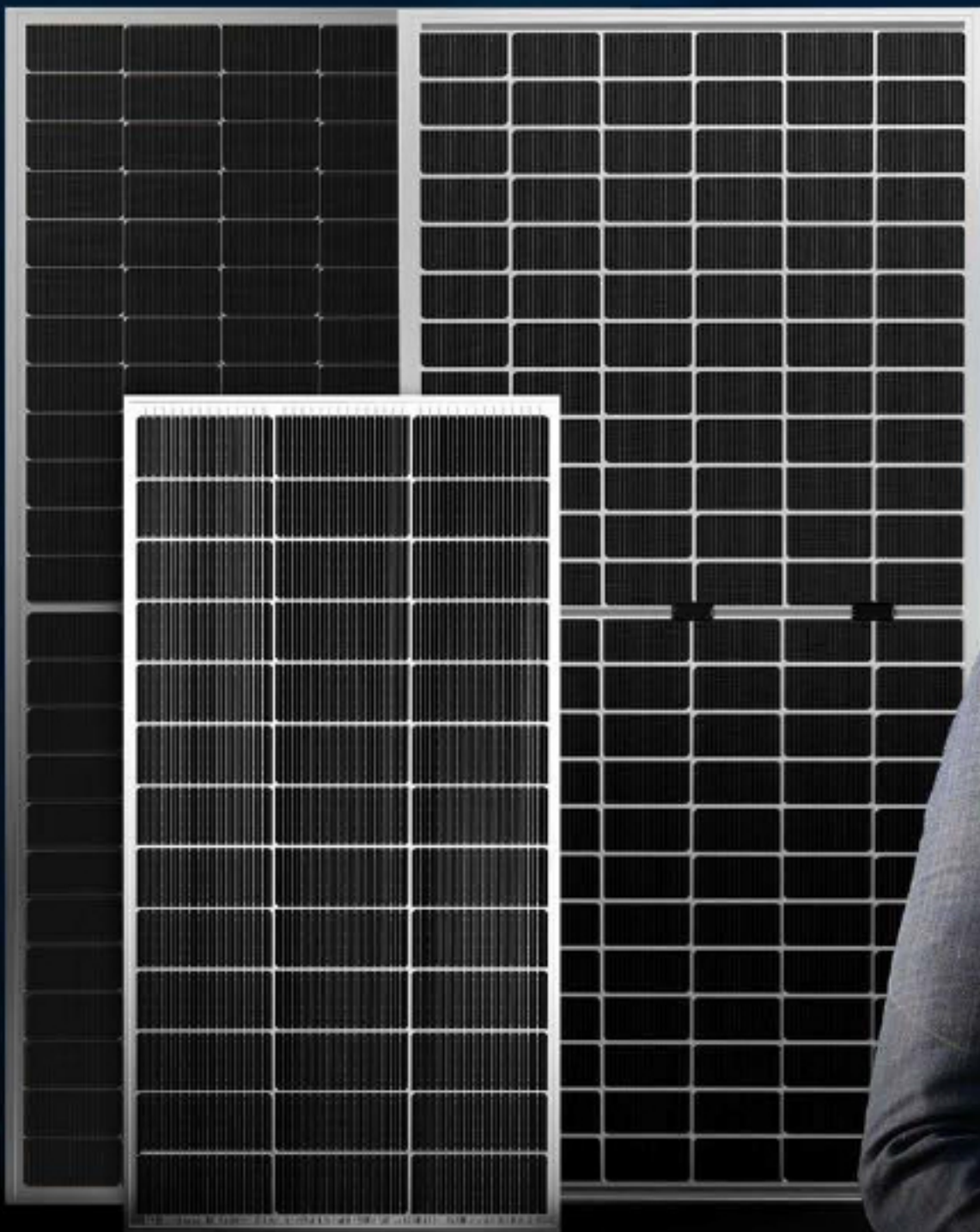
He told the audience that IPPs had started agreeing to the government's demand to revise their power purchase agreements after the FPCCI leadership had successfully campaigned against the unjust capacity charges responsible for the massive rise in electricity costs for businesses and industries. "Owing to the FPCCI's movement, the thorny issue of capacity charges unjustly paid to the IPPs will soon be resolved amicably in the most peaceful manner," he said. Growatt Country Head, Mian Fahad, said the clean energy companies needed assistance from the Sindh government and FPCCI to ensure that a greater number of new housing projects and industries in Karachi should become self-reliant in their electricity needs by maximum solar energy production.





He said that Growatt stood fully committed to providing the latest smart solutions to maximise solar energy production while tackling the issue of severe space constraints in densely populated urban areas like Karachi. He said that Pakistan had lately registered a phenomenal annual increase in the use of solar power systems, showing the vast potential of its clean energy market. ■



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Resolving power sector woes

The reasons of woes are incompetence, misgovernance and theft; currency mismatch induces tariff increases

Shahid Kardar

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

The task of the country's population has been reduced to keeping power sector entities afloat, by bearing unaffordable tariffs. And yet the sector's financial viability remains in doubt. How did we get here? The reasons include incompetence, misgovernance and unadulterated theft. The terms were poorly negotiated with investors.

Agreements with private IPPs were drafted with limited professional input, stained by issues of patronage and lack of transparency. The issues include currency mismatch — pay-

ments to them were denominated in dollars against revenue streams in rupees — generous concessions (for example, sovereign guaranteed returns on equity of 15 per cent in dollar terms and income tax exemptions during the contracted period), and the government covering all risks.

What's more bizarre is that government-owned power plants, managed by non-professionals, were established on the same terms as those bestowed on privately owned ones. 'Circular debt' is the outcome of these fundamental issues that have rendered the economy uncompetitive and thus a huge constraint to sustainable growth.

Examples of incompetence include the slow pace of expansion of transmission and distribution (T&D) systems compared with the installed

capacity of generation. Their capacity today is merely 22,000 MW (add to it the Lahore-Matari transmission line operating at 40pc of its designed capacity), resulting in 50pc of the generation facility being unutilised but still receiving capacity payment. This liability has become excruciating, with the idle capacity payment increased from 60pc to 85pc under the 2015 policy.

The currency mismatch has induced tariff increases following the sharp adjustment in the rupee's value — from the rate when agreements were signed — and higher interest rates. This contributed to reduced demand, for reasons including the closure of several textile units and the shift off-grid by some with their own power arrangements. Sluggish growth and subdued demand necessitated that obligations for capacity payments be discharged by raising the rate per unit for recovery from fewer consumers, a subject of widespread debate, if not anger. The burden is made more painful by taxes of almost 30pc of the electricity price.

To address the inadequacies of T&D systems, several reforms are required.

The result is that whereas capacity utilisation costs are 30-35pc globally, ours are now 62-70pc. More importantly, 50pc of capacity payments are to government-owned generation plants. Of the remainder, 35pc goes to Chinese-imported, coal-fired, dollar-indexed projects, with the unit cost much higher than that of local coal-based plants. Other sectoral issues have been over-invoicing by IPPs, with the Central Power Purchasing Agency looking the other way, supplemented by Nepra's lack of regulatory



IMF bailout: a double-edged sword for economic growth

Pakistan cannot afford to remain perpetually dependent on international financial institutions

Gulab Umid

The writer is an analyst based in Turbat

Pakistan cannot afford to remain perpetually dependent on international financial institutions.

The approval of a \$7 billion IMF loan has brought a glimmer of hope to Pakistan's economic landscape. However, this marks the country's 24th engagement with the IMF - a stark reminder that Pakistan has failed to implement necessary reforms in its previous attempts. Securing this bailout required significant diplomatic and financial maneuvering, including securing \$2 billion in commercial financing and over \$16 billion in rollovers from friendly nations like China, Saudi Arabia and the UAE. While these nations have consistently shown their goodwill, the reality is that Pakistan has found itself trapped in a web of mounting debt due to years of governance failures and political short-sightedness.

Pakistan's governance structure, weighed down by inefficiencies, is one of the largest burdens on the national exchequer. Even after the 18th Amendment, a multitude of redundant ministries and departments still exist at the federal level, serving little purpose while draining national resources. Additionally, decades of political appointments have crippled public institutions, pushing them towards financial ruin. Pension obligations for retired employees have become an unsustainable challenge. A long-standing lack of fiscal discipline and economically irresponsible, politically motivated decisions have hollowed out the country's economic foundations, making it impossible to provide essential services like quality healthcare and education to its citizens. The current economic crossroads presents a pivotal moment for Pakistan. If the government fails to make politically difficult decisions now, the opportunity to escape the debt trap may never come again. The recent IMF bailout offers a window of temporary relief, but without fundamental reforms, this too will become just another band-aid on a chronic wound. The

consequences of inaction will be unforgivable in the eyes of history.

One area where the government has already demonstrated a lack of resolve is in its tax reforms. In an apparent concession to political pressure, the government has compromised with non-filers in sectors such as retail, real estate and agriculture. Moreover, efforts to privatise loss-making SOEs have been woefully slow. This indecisiveness is particularly troubling, given the already disproportionate tax burden placed on the salaried class and the industrial sector.

Rather than overburdening the same taxpayers, the government should be prioritising measures to stimulate economic activity. A strategic focus on boosting exports would be one of the most effective ways to achieve this. Competitive energy tariffs for export industries and efficient refund payments to alleviate capital shortages are critical steps in this direction. However, the government's current strategy of placing additional tax pressure on the salaried class is counterproductive. When citizens' incomes are disproportionately spent on taxes and basic necessities, consumer spending which is the backbone of economic growth shrinks. This lack of disposable income reduces overall economic activity and makes attracting foreign direct investment even more challenging. Presumably, Pakistan cannot afford to remain perpetually dependent on international financial institutions. To break this cycle, the \$7 billion IMF loan must be used to strengthen the economic foundation, not just patch over the immediate fiscal shortfalls. Pakistan's economy is on the cusp of a potential breakthrough, but political stability is a non-negotiable prerequisite for sustained growth. Political leaders need to recognise that their internal disputes and power struggles are contributing to the nation's economic instability, harming the very citizens they purport to serve.

The IMF loan offers a critical lifeline, but only if it is coupled with meaningful reforms that address the root causes of Pakistan's financial instability. Political stability, prudent fiscal management and bold economic reforms are essential if Pakistan is to break free from the cycle of debt and dependency. ■

oversight. Several public sector Gencos are old and outdated plants, resulting in inefficient fuel consumption, with low utilisation (2.7pc in the case of Jamshoro) but with a bloated idle workforce.

To address the issues, the starting point should be the Gencos commissioned by the public sector. The old ones should be quickly phased out, thereby not only minimising the payout on capacities but also enabling the operation of efficient units.

The decision to extend the tenure of the contracts of IPPs set up under the 1994 policy was a poor one. The sustainable choice is to persuade them — the contracted period having been completed and the debt paid off — that generated energy would be procured in rupees, and only if it is at competitive rates.

The units established under the 2002 and 2006 policies, mostly by Pakistanis, should be persuaded to accept upfront a significant percentage — not the full dues — of capacity-related commitments for the remaining contracted period of roughly two to three years, with their debt obligations discharged. Thereafter, their contracts should be renegotiated along the lines proposed for the 1994 policy.

However, for Chinese IPPs launched in 2016-17 (guaranteed 20pc in dollars), a different treatment will be required as they would resist any revision in the contracts, arguing that their contracts factored in the lessons learned from the projects commissioned under the 1994 and 2002 policies. Two possible options could be: a) extend the contract period, and b) the release of some capacity to be freely traded in the market. Finally, taxes on bills should be lowered, employing several other options to control the fiscal deficit. These interventions will enable, in the medium (three to five years) term, full exploitation of rapid technological developments in renewable energy options.

These efforts should be complemented by adequate and timely investments to address the technical inadequacies and governance issues of T&D systems. ■

Climate under siege

A broader pattern of extreme weather has gripped region

Masood Lohar

The writer is an expert on climate change and sustainable development, and founder of Clifton Urban Forest

Following extreme heat-waves in almost every corner of the world, heavy rains and floods shocked the global community. This is becoming a pattern.

The recent past witnessed an unprecedented series of extreme weather events across South Asia and neighbouring regions, with devastating impacts on lives, infrastructure, and economies. A powerful monsoon system wreaked havoc, triggering catastrophic floods, landslides, and storms across India, Bangladesh, China, and Pakistan.

Not too long ago, a thunderstorm-laden monsoon swept into southern Sindh after causing significant damage in India's Gujarat and Rajasthan regions. The monsoon, which has been unusually intense this season, brought with it torrential rains, strong winds, and widespread flooding. Major cities were inundated, with low-lying areas submerged and infrastructure damaged.

We saw people being displaced due to rising water levels, with power

outages and road blockages hampering rescue and relief efforts. An emergency was declared in parts of the country, as the authorities urged residents to stay indoors. The disaster follows a broader pattern of extreme weather that has gripped the region. Lately too, heavy rainfall has been predicted in certain areas in the week ahead.

A broader pattern of extreme weather has gripped the region. In India, the monsoon's fury and torrential rains, especially in Gujarat and Rajasthan, also led to flash floods that engulfed villages and towns, resulting in significant loss of life and property, with thousands rendered homeless. Emergency services were stretched to their limit, and conducting rescue operations in flooded areas and providing relief to affected populations was difficult.

Himachal Pradesh and Uttarakhand, too, felt the impact, with landslides triggered by the relentless rains. Entire villages were buried under mud and debris, with rescue efforts hampered by treacherous conditions. Further rains were also forecast for the current month, raising fears of additional inundation.

Meanwhile, Bangladesh is already prone to flooding due to its low-lying geography, and it was no surprise that it was severely affected by this year's monsoons. Incessant rains caused the major rivers — the Brahmaputra, Ganges, and Meghna — to overflow, leading to widespread flooding across large parts of the country.

Millions were reported to have been affected, with many residents forced to flee their homes and seek refuge in temporary shelters. The floods also destroyed vast swathes of agricultural land, threatening the livelihoods of thousands and raising concerns about food secu-

rity in the months ahead. The Bangladeshi government, along with international aid organisations, has worked around the clock to provide relief, but the scale of the disaster was overwhelming.

China was not spared the effects of extreme weather either, with the months of July and August bringing with them historic flooding and the onslaught of Typhoon Doksuri. The flooding, particularly in the northern and central regions, has been the worst in decades, with major rivers like the Yangtze and Yellow River swelling to dangerous levels. In some areas, entire cities were submerged, leading to massive evacuations.

The extreme weather events in South Asia and China are stark reminders of the growing impact of climate change. Scientists have long warned that global warming is leading to more intense and unpredictable weather patterns, with monsoons becoming more erratic and storms more powerful. The consequences are devastating for countries in the region, many of which are densely populated and heavily reliant on agriculture.

As the region grapples with the recent disasters, the urgency for robust climate adaptation strategies is clear. Governments must prioritise investing in resilient infrastructure, strengthening early warning systems, and enhancing community-level disaster preparedness to better withstand extreme weather events.

If mitigation efforts are not significantly scaled up, these extreme weather events could become even more frequent and severe, making large parts of the world increasingly uninhabitable. Rising sea levels could inundate coastal cities, displacing millions and leading to unprecedented migration crises. Agricultural systems, already under stress, could collapse, leading to widespread food shortages and economic instability. Without concerted global action to reduce greenhouse gas emissions and adapt to the changes already underway, the future could see a cascade of environmental, social, and economic disasters. The time to act is now, as the cost of inaction is far too great. ■



Solarizing Olympics in Los Angeles



Harvey Wasserman

When the Olympics return to Los Angeles in 2028, we can make history – and vastly lower our electric rates, clean our air and employ our people – by making sure the games are 100% powered with local-generated solar energy.

That clean green electricity should not be wired in via an obsolete, overstressed grid, coming from places that should otherwise be left in their natural state. Instead we have four full years to cover every appropriate southern California rooftop with photovoltaic cells.

That would mean installing solar arrays atop this mega-city's many square miles of warehouses, businesses, factories and homes. It would also embrace our parking lots and structures, sports stadia, aqueducts, canals, rivers, reservoirs, all powering local-based micro-grids that can save billions in unnecessary generation and transmission costs. This Olympian deployment would be a great long jump for southern California's power supply. As we've seen from the state's 1.8 million rooftop PV installations, solar-generated electricity can be far cheaper than anything coming from fossil or nuclear fuels.

Our state-wide grid now regularly goes 100% renewable, usually in our sun-

drenched afternoons, where photovoltaic power becomes "too cheap to meter." By then charging batteries across the state, our demand surges in the evenings are covered cheaply and reliably.

Until very recently our rooftop solar businesses employed some 70,000 Californians. But now we're losing far too many good jobs to devastating regulatory manipulations that have gutted far too many of our state's green businesses.

An Olympian push can make this great green industry boom again, especially if the cells and panels are manufactured here.

Advanced battery storage is plummeting in cost. Within the past few years California has installed more than 10,000 megawatts of stored capacity – nearly five times what we get from the two dangerous, expensive atomic reactors at Diablo Canyon.

Advanced battery technology can now permanently protect the region and state from any future melt-downs or blackouts. When it does, our soaring electric rates will head straight down.

The 2032 Games are already scheduled for Australia, exactly a century since they first happened right here. Los Angeles must do no less. We still have residual playing fields and event structures in place from the 1984 Games. SoFi and other recently built facilities that will be part of the festivities have already taken significant steps toward solarization.

A green corridor for Chinese investors

Ayesha Naeem

The writer is a researcher based in Islamabad

Pakistan has potential to add 23,801 MW — around 31.5 percent of renewable energy capacity till 2030

As China accelerates its investment in renewable energy, setting a global example in Green Development by adding 133 GW of capacity in just the first half of 2024 — a 25 percent increase from the previous year there is a unique opportunity for Pakistan for rapid expansion of its renewable energy capacity, given its partnership under China-Pakistan Economic Corridor.

Pakistan has the potential to add 23,801 MW — around 31.5 percent of renewable energy capacity till 2030, as confirmed by the World Bank's Variable Renewable Energy Locational Study. However, it currently has a mere 7 percent contribution from renewable energy in its energy mix.

This disparity presents a significant opportunity. It also highlights a pressing issue. Despite its enormous potential of generating clean

energy, Pakistan has struggled to attract the necessary investments for its \$115 billion renewable energy transition.

China's remarkable progress in renewable energy is a testament to its strategic shift towards sustainable development that has positioned it as a global leader in Green Technology. With 339 GW of utility-scale wind and solar projects already in the works, China holds 64 percent of the world's total capacity in these sectors. Pakistan stands to benefit from this trend, given its substantial financing needs for transitioning to renewable energy and its collaboration with China under the CPEC and beyond.

As Pakistan transitions into CPEC Phase-II, prioritising business-to-business engagement, the focus on green infrastructure within the scope of the Green Corridor presents significant opportunities for Chinese businesses and private investors in renewable energy. However, current policy frameworks and financial instruments have failed to provide the necessary incentives for large-scale investments in renewable energy.

Pakistan's renewable energy ambitions - generating 30 percent of the country's energy mix from renewable resources by 2030 - face several critical issues. The absence of a

comprehensive national industrial policy for over two decades has left the country without a clear roadmap for prioritising industries, including those related to Green Energy.

Policy shifts with every change of government have created an unstable political environment that discourages long-term investments. Special Economic Zones that can be hubs for renewable energy are failing to attract significant investments due to excessive regulation, a lack of accountability, economic uncertainty and insufficient incentives, including tax breaks and machinery import exemptions.

In its recent agreement for another loan package, the International Monetary Fund has asked Pakistan to phase out tax exemptions and some other incentives given to the SEZs that can aggravate the business environment and discourage

investment.

To facilitate its transition to clean energy, Pakistan needs to explore alternative financing mechanisms such as Green Investment and Finance Partnership, Energy Transition Mechanism, and Just Energy Transition Partnerships. However, a lack of understanding around of suitable financial instruments and underdeveloped markets makes it difficult to channel funds from global markets into renewable energy projects.

Developing financial instruments, such as Green Bonds and Renewable Energy Certificates, tailored to the Pakistani market is also critical. These instruments could help attract both local and international private investments.

Effective implementation of Green Finance initiatives is a necessary condition for the development of the local renewable energy industry. This can be achieved by establishing a joint working group on greening CPEC projects to facilitate collaboration between Chinese banks, environmental, social and governance investors and local regulators.

Developing financial instruments, such as Green Bonds and renewable energy certificates, tailored to the Pakistani market is also critical. These instruments could help attract both local and international private investments.

Pakistan must take decisive steps to capitalise on the investment opportunities provided by the CPEC. The second phase of the CPEC emphasises the operationalization of SEZs across Pakistan to facilitate Chinese investment, offering a strategic opportunity to localise the renewable energy industry.

The SEZs set up under this phase in Faisalabad, Rashakai, Dhabeji and Bostan provide an ideal platform for the localisation of the renewable energy industry. China, a global leader in solar power, manufactured 80 percent of the world's solar panels and is the largest investor in

Pakistan with approximately 87 percent of foreign investment in solar PV.

However, this can only be possible with long-term policy clarity, including political guarantees and incentives for stable agreements that encourage low-carbon investments from. Establishing clear Green Investment criteria for Chinese investors and ensuring the financial viability, security and profitability of these projects will be essential for success.

Focusing on small-scale renewable energy projects and decentralised management can improve energy efficiency and access while promoting the renewable energy industry. China's mini-grids for rural electrification, particularly through initiatives like the Township Electrification Programme focused on distributed generation from renewable sources. 688 villages are powered by PV-battery mini-grids.

These can be used for rural electrification. Electric power can thus be supplied in underserved areas such as rural Sindh and the mountainous districts of Gilgit Baltistan, Khyber Pakhtunkhwa and Balochistan, where nearly 40 percent of the people still lack access to electricity.

Implementing these reforms can help Pakistan tap into its vast renewable energy potential. By diversifying its power generation sources and reducing reliance on thermal and hydropower projects, Pakistan can address its three-pronged crisis of energy insecurity, low human development index and economic stagnation.

There are vast opportunities for investors, developers, manufacturers and financial institutions. The government must create an enabling environment to attract more investments in renewable energy solutions. This requires confidence-building measures for investors, addressing market access concerns and ensuring a stable and supportive regulatory framework. Pakistan must achieve energy security while reducing carbon emissions. ■





Yousaf Hussain elected OICCI president

EU Report

Yousaf Hussain, President and CEO of Faysal Bank Ltd., has been elected as the new president of the Overseas Investors Chamber of Commerce and Industry (OICCI) for the 2024-2026 term. The announcement was made during the Chamber's Extraordinary General Meeting. Joining him in leadership roles, Jason Avancena, Managing Director and CEO of Nestle Pakistan Ltd., was elected senior vice president, and Syed Ali Akbar, Managing Director and CEO of Pakistan Tobacco Company (Pvt) Ltd., was elected vice president.

The newly formed Managing Committee, comprising top business leaders from sectors including banking, telecommunications, and pharmaceuticals, is expected to guide OICCI's future strategy. Other committee members include Aamir Hafeez Ibrahim of Pakistan Mobile Communications Ltd. (Jazz) and Hafsa Shamsie of Roche Pakistan Ltd. ■

Engr. Rahil Pitafi Represents Pakistan at Gastech 2024 as a Leading Speaker on LNG

Engr. Rahil Ihsan Pitafi, Joint Executive Director of the Oil and Gas Regulatory Authority (OGRA), proudly represented Pakistan at Gastech 2024, one of the world's most prestigious events for the natural gas, LNG, and energy sectors. Chosen as a Technical and Commercial Stream Speaker, Engr. Pitafi was the only Pakistani selected to present at this global forum, following a rigorous selection process by Gastech's governing body.

His presentation, titled "LNG: Navigating Pakistan's Energy Landscape," emphasized Pakistan's growing significance as a key player in the global energy market. He highlighted Pakistan's strategic location as an energy hub and its increasing reliance on LNG to meet the country's expanding energy needs. Engr. Pitafi also detailed government efforts to liberalize the gas market, creat-



ing opportunities for foreign investment in LNG infrastructure. Engr. Pitafi's participation brought global recognition to Pakistan's role in the energy transition, showcasing its potential as a prime investment destination for LNG projects.



Team Energy Update presenting energy update magazine to team Solis at Pakistan Sustainability week 2024.

Pakistan and Saudi Arabia strengthen economic ties with \$2.2 billion MoUs across multiple sectors

Pakistan and Saudi Arabia solidified their strategic partnership with the signing of 27 Memorandums of Understanding (MoUs) valued at \$2.2 billion. These agreements span a wide array of sectors, including industry, agriculture, IT, education, health, petroleum, mining, energy, and food.

The MoUs were signed during a high-profile visit by Saudi Arabia's Minister of Investment, Sheikh Khalid Bin Abdul Aziz Al Faleh, who led a business delegation to Islamabad. The signing ceremony was attended by Prime

Minister Shehbaz Sharif, Chief of Army Staff (COAS) General Asim Munir, and other senior officials from both nations. The visit reflects the growing economic collaboration between the two countries, underpinned by mutual respect and a shared vision for the future.

Prime Minister Shehbaz Sharif praised the delegation's visit as a "true manifestation of the deep affection" that Saudi Arabia's leadership holds for Pakistan, particularly under the guidance of Crown Prince Mohammed bin Salman. The prime minister expressed optimism

that the agreements would pave the way for even greater economic cooperation, reiterating his government's commitment to fast-track the implementation of these MoUs.

"We will work tirelessly to transform these MoUs into concrete agreements that will benefit both nations," Sharif said, vowing to eliminate any bureaucratic hurdles. He also lauded Saudi Arabia's support for Pakistan during its recent engagement with the International Monetary Fund (IMF), which helped the country secure a critical financial package. ■

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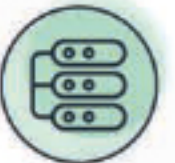
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Power sector realities of Pakistan

Dr Raashid Wall Janjua

A forensic audit by Nepra should be conducted to determine any excess profits earned by IPPs; power sector's problems stem from poor capacity utilization and inadequate demand; inefficient GENCOs should be shut down after resolving their human resource issues

Let us proceed step by step in identifying the realities of the power sector that have led to the current crisis and explore remedies in the form of sustainable solutions. The first issue is our skewed power generation mix, where thermal generation, mostly dependent on costly imported fuel, has outpaced the hydel and renewable components. According to energy experts, for power generation to be economical in Pakistan, hydel generation should account for a minimum of 50 per cent. Currently, it stands at only 28.3 per cent. For an oil-importing country with inadequate and dwindling gas reserves, increasing the share of renewables and hydel in the national power generation mix is a strategic necessity.

The second issue is flawed planning and execution on the supply side. Over time, we have based our capacity enhancement on overly optimistic assumptions of economic growth through the Indicative Generation Capacity Expansion Plan (IGCEP). Our power sector's problems stem from poor capacity utilization and inadequate demand, especially in the industrial sector. The IGCEP was based on a 6.0 per cent growth projection, while the IMF now projects just 2.8 per cent. Since the industry has not grown as expected, the installed electricity capacity has not been fully utilized, leading to higher capacity charges. Another issue recently raised by APTMA is the high industrial tariff and the impact of cross-subsidies. The matter of subsidies and cross-subsidies must be viewed holistically. There are direct subsidies provided by the government to poor consumers, as well as subsidies from some consumers to others. Additionally, there are intra-disco subsidies, such as those from LESCO to HESCO and SEPCO. The industrial tariff was reduced by Rs8 in January 2024 by removing

a cross-subsidy of Rs7-8 to stimulate demand. To lessen the burden of capacity payments, industrial demand needs to be further increased.

Another pressing issue is the high-capacity charges of IPPs, which were established during a time of acute power shortages when no investor was willing to invest in Pakistan. The 'Take or Pay' contracts should not have been agreed upon, but they were introduced under circumstances where Pakistan's single-buyer market compelled Independent Power Producers (IPPs) to maintain the ability to supply power at all times, as directed by the National Power Control Center (NPCC) and Nepra, following the Merit Order Dispatch system. In Pakistan's power sector, there is a single transmission grid that does not accommodate a multi-buyer market.

Some countries, like China, operate a single-buyer market efficiently, while others, such as the UK and US, run equally efficient multiple-buyer market models. In Pakistan, however, the power sector faces significant distribution challenges. The country suffers from 16 per cent annual T&D (Transmission and Distribution) losses and 11 per cent collection losses, resulting in a combined loss of 27 per cent of the electricity

generated. In contrast, the global average for T&D losses is only 10 per cent. To improve performance, Pakistan's DISCOs should be privatized, and a competitive multi-buyer market should be established under the Competitive Trade Bilateral Contract Model (CTBCM).

Pakistan's installed generation capacity stands at 42,131MW, whereas the transmission grid can only handle 29,000MW, currently running at 22,000MW due to technical issues within the grid. The transmission system, particularly the north-south transmission line, faces serious challenges, especially during the winter months. During this time, cheaper power generated in the south cannot be transferred to the north. Additionally, the cheaper power in the south cannot be used as an incentive for the industry in the south because it would disrupt industrial competitiveness between the north and south. Therefore, the problems related to the north-south transmission grid must be resolved. The government should also encourage bilateral Power Purchase Agreements (PPAs) and wheeling agreements in a business-to-business (B2B) model. Developing a north-south gas pipeline should be prioritized to make gas more readily and economically available to IPPs.

Now, turning to the issue of capacity payments, it is important to note that no IPP can operate without capacity payments. This is because IPPs must cover their debts, and fixed maintenance costs to ensure the readiness of their plants and provide returns to investors. The average capacity tariff for imported, Thar coal-based, and RLNG plants with an installed capacity of 11,500MW was less than Rs3 per unit when the tariff was determined in 2015-16. Since then, Rs18 per unit has been added due to lower dispatch

and macroeconomic factors. Capacity charges account for only 31 per cent of the total consumer tariff. According to Nepra's State of Industry Report 2022-23, government taxes, surcharges, and duties collectively contribute an additional 32 per cent to the consumer tariff, over and above the cost of electricity.

The share of CPEC projects, including Thar coal-based IPPs, is disproportionately high in the capacity payment components. Out of Rs2.14 trillion in capacity payments to IPPs, Rs880 billion is allocated to Chinese-owned CPEC IPPs and other coal IPPs, while only Rs130 billion goes to IPPs established under the 1994 and 2002 policies. Therefore, the debt terms with CPEC IPPs need to be renegotiated through government-to-government (G2G) talks, focusing on extending the debt tenor from 10 to 20 years and reducing the debt margin from 4.5 per cent to 2.0 per cent.

Government-owned GENCOs make up 52 per cent of the IPPs; they are inefficient and outdated but are not being retired due to issues related to ex-government employees and pensions. These inefficient GENCOs should be shut down after resolving their human resource issues, while the efficient ones should be privatized to promote greater efficiency. The PPAs with privately owned IPPs, however, need to be renegotiated by consensus, particularly regarding changes to the Return on Equity (ROE) and dollar indexation, wherever applicable.

A forensic audit by Nepra should be conducted to determine any excess profits earned by IPPs in the past due to efficiency gains and O&M savings, with cases referred to arbitration if the IPPs do not cooperate. All imported coal-based IPPs should be converted to Thar coal, and the infrastructure for mining and power evacuation in Thar should be significantly improved. Finally, capacity utilization in the power sector, as per the IGCEP, should be ensured, particularly in the industrial sector, to boost productivity and reduce electricity costs. Unless we address these power-sector realities through a comprehensive and holistic intervention, we will remain stuck in endless debates without real solutions. ■



SOLAR PAKISTAN EXHIBITION



showcases cutting-edge solar solutions



EU Report

SolaX Power, a global leader in solar inverter technology, has concluded a highly successful participation in SOLAR PAKISTAN, held from September 26 to 28 at the Karachi Expo Centre.

In the face of Pakistan's ongoing energy shortages and frequent load-shedding, SolaX Power introduced innovative solar solutions that promise to alleviate electricity challenges and reduce the financial burden of high energy costs for both households and businesses.

SolaX Power's exhibition at Hall 3, Booth C-3-01 to C-3-08 featured two flagship products that garnered significant interest from energy professionals, business leaders, and government officials. We were honored to welcome Sharieel Inam Memon, the esteemed representative from the Ministry of Information, Sindh, as he explored our groundbreaking innovations. His visit shines a spotlight on the future of

Energy Solutions for Pakistan, and we're proud to be leading the charge toward a greener future.

X1-LITE-LV: This low-voltage inverter is designed specifically for small-scale residential solar installations, providing reliable and cost-effective performance. The X1-LITE allows homeowners to efficiently reduce their reliance on the grid, significantly lowering electricity costs and ensuring a steady power supply during outages.

X3-NEO-LV: Designed for commercial and industrial applications, the X3-NEO inverter delivers high performance in large-scale solar energy systems, even in

regions experiencing frequent grid instability. The X3-NEO-LV offers robust support for businesses, enabling them to maintain operational efficiency despite power interruptions.

SOLAR PAKISTAN, the region's premier solar and energy exhibition, provided SolaX Power with a critical platform to engage directly with the local market, highlighting its dedication to addressing the energy challenges that Pakistan has faced for years.

With its aging energy infrastructure and frequent load-shedding, the country is in urgent need of alternative solutions to meet rising electricity demands and reduce reliance on fossil fuels. The event saw tremendous engagement from both residential and commercial sectors, underscoring the importance of reliable solar technology in providing immediate relief.

'Pakistan is at a crucial juncture in its energy journey,' said Tiger Yan, country manager of SolaX Power. 'SolaX is committed to offering high-quality solar technology that not only reduces the economic burden of high electricity costs but also provides a sustainable solution to the country's chronic power shortages. Our goal is to empower residents and businesses alike to take control of their energy needs.'

The products displayed by SolaX Power offer significant benefits for a wide range of users. The X1-LITE-LV gives individual households the ability to combat load-shedding by storing and utilizing solar energy during peak outage times, while the X3-NEO-LV allows larger commercial enterprises to operate seamlessly during grid failures, minimizing downtime and improving productivity.

SOLAR PAKISTAN exhibition reinforced the need for renewable energy solutions in the region. As solar energy adoption continues to rise, SolaX Power remains at the forefront, offering reliable, efficient, and cost-effective solutions that directly address the energy challenges faced by millions in Pakistan. ■



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Celebrating Solar Energy Milestones: **HUASUN HJT Exclusive Gala**

EU Report

On September 20 and 24, the solar energy landscape in Pakistan witnessed a remarkable celebration with the 'HUASUN HJT EXCLUSIVE GALA' held in Lahore and Karachi. These events marked a significant achievement: the successful shipment of over 100 MW of Huasun's heterojunction (HJT) products to Pakistan, a testament to the growing potential of the country's solar market.

The gala brought together industry leaders, investors, and professionals, all recognizing this pivotal milestone while exploring the promising future of solar energy in Pakistan. During the festivities, nearly 20 partners were honored with 'Outstanding EPC' and 'Performance Awards' for their exceptional contributions, underscoring the collaborative efforts driving Huasun's product adoption.

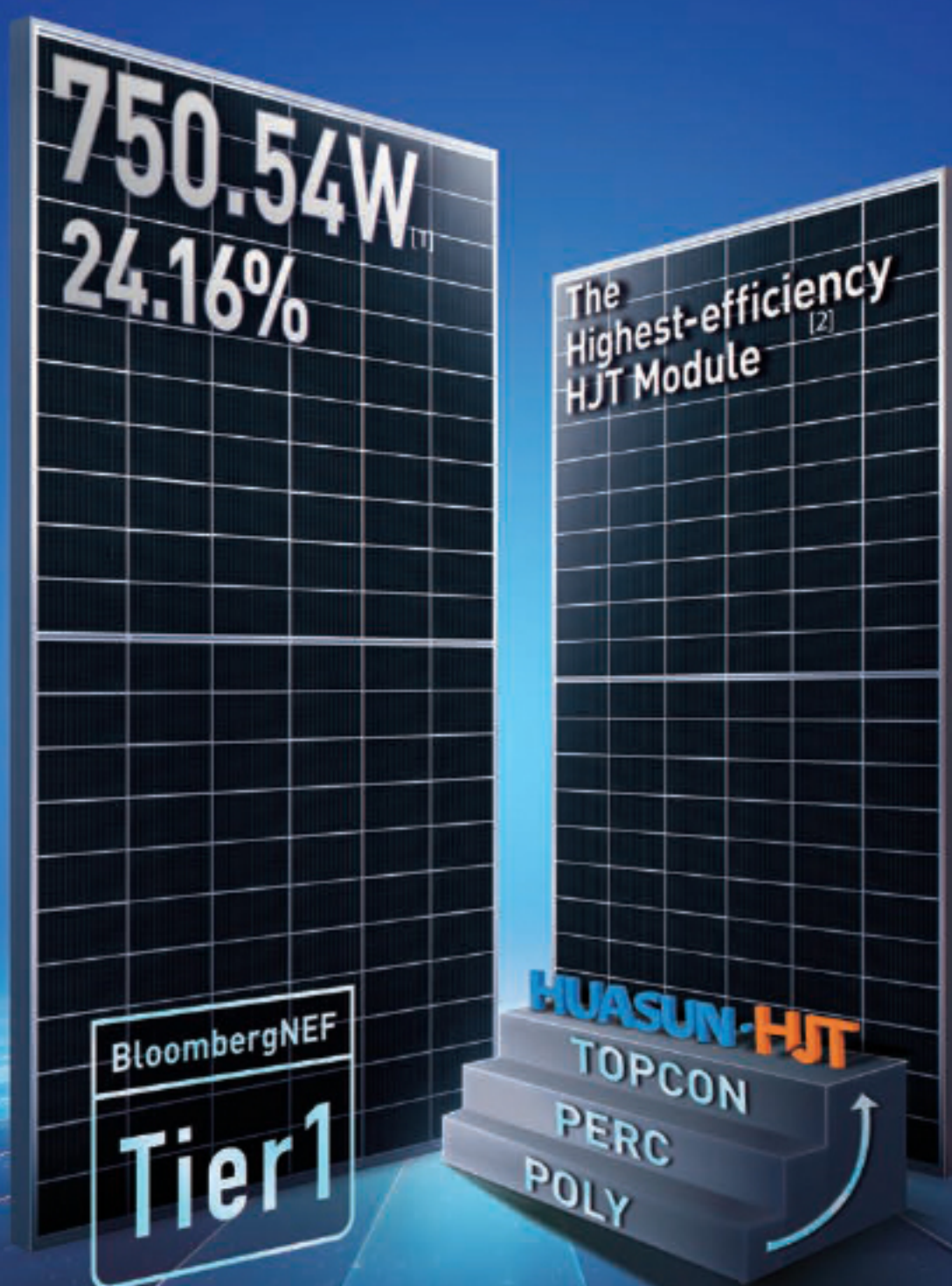
A highlight of the event was the unveiling of Huasun's innovative zero busbar (OBB) HJT module, showcasing advanced technology that significantly enhances power generation and reliability. The presentations by Christian Comes and Kayn Huang provided valuable insights into the future potential of HJT technology, solidifying Huasun's commitment to expanding its footprint in Pakistan. As Huasun continues to deepen its presence, the focus remains on harnessing Pakistan's abundant sunlight and meeting the increasing energy demands of the nation. Together, we are paving the way for a more sustainable energy future! ■



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


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Managing energy demand with solarization

All households should consider investing in solar home systems for electricity; providing direct support to low-income households to adapt to future energy scenarios will be far more efficient; policymakers should support low-income households

Waqas Bin Najib

The writer is a former member of the Planning Commission

Looking ahead, all households should consider investing in solar home systems for electricity and solar water heating to reduce energy expenses in the future.

The government has historically provided unreasonably cheap energy (electricity and gas) and did not enforce building standards, appliance standards, or other energy efficiency measures. Meanwhile, we recklessly expanded the transmission and distribution networks. Consumers adjusted to high availability and low-cost energy, and residential demand grew. Today, the challenge is transitioning from cheap, abundant energy to a scenario with expensive and limited supply.

I have argued that residential energy consumption in the country is unsustainable. Both electricity and natural gas are consumed wastefully and do not produce any economic output. I also say that the

government needs to curtail the supply to residential and commercial consumers who contribute to peak demand — mainly middle- and high-income consumers.

Utilities are adopting this even in advanced markets like the US; for example, the electric utility company controls the air conditioners and electric vehicle home chargers in Texas and can turn the appliances off during peak load hours. A cruder version of a similar approach can be adopted in Pakistan to reduce peak demand and household energy costs.

Electricity and natural gas prices in Pakistan will increase in the coming years. The capacity payments for the new power generation projects will drive the electricity prices higher, while the increasing contribution of imported LNG will increase the gas prices. The inevitable rupee devaluation will also contribute to an increase in electricity and natural gas prices.

The energy situation in Pakistan is driving the economy down.

The impact of high pricing will be disproportionately more significant for low-income consumers in the country. Lower-income households will need



government support to adapt to the changing energy landscape. According to the last Household Integrated Economic Survey in 2019, households spent seven per cent of their average income on energy — mainly electricity and gas. Lower- and middle-income households spent 8.5pc of their income on energy. Since that survey, increasing prices and stagnant income levels are expected to have increased energy expenditures by up to 10pc of household income.

Energy expenditures are around 5pc of household income in most developed and developing countries. The International Energy Agency (IEA) reports 2022 figures for the contribution of energy to average household expenditures: 5.5pc in Mexico, 5pc in Indonesia, 4.8pc in the UK, and around 3pc in the US and Canada. The high expenditure on energy by households in Pakistan should be seen in the context of energy poverty: our per capita energy consumption of only 3,895 kWh/capita/year is among the lowest in the world — one-tenth of Iran, the EU, or China, and almost half that of India.

The energy situation in Pakistan is driving the economy down and contributing to the prevalence of poverty.

Where do we go from here? The government must try to curtail demand to reduce new-generation requirements and other necessary sector reforms. Meanwhile, consumers must adapt to the new energy situation. Energy efficiency and demand-side management are the cheapest ways to reduce energy costs.

Households have a few options for managing their demand. These include solar home systems, energy-efficient

appliances, intelligent energy management systems, and low-energy buildings. Appliance replacements and building envelope improvements (such as building insulation solutions) will be demand-driven rather than regulation-driven. The government should introduce the labelling of appliance energy-efficiency ratings and work towards increasing consumer awareness of energy efficiency improvements.

Solar home systems remain the best option to reduce energy costs. Consumers should consider solar PV systems for electricity generation and solar water heaters to reduce gas consumption. Solar water heaters can act as pre-heaters for conventional water heaters, while solar PV systems will supplement the grid electricity.

The current net-metering policy for grid-connected solar systems only applies to three-phase consumers, around 10pc of residential consumers. The remaining 90pc are single-phase consumers. Most single-phase consumers belong to middle- and low-income groups. A grid-interconnection policy for single-phase consumers is essential to enable them to install solar home systems.

The grid-interconnection scheme enables the consumers to inject the excess electricity produced by the solar system into the grid and adjust equivalent units against consumption. Under the current policy, the exported and imported units are netted off, and consumers are expected to be paid the off-peak tariff rate if they have unconsumed excess units.

The current policy needs to be revised to reflect the costs of using the grid as temporary storage. The policy must be changed for all the existing and new

consumers. Grid interconnection for solar home systems should shift to gross metering (K-Electric in Karachi already uses gross metering), and the buy-back rate should be around four US cents (Rs12) — roughly the last solar tariff awarded by Nepra. The price should be based on the alternate option for the grid to procure solar power and correctly reflect the costs of using the grid as storage. Even with a lower buy-back price for solar home systems, installing solar electricity systems will still be an attractive investment for households.

However, solar does not reduce the conventional power demand requirement. Pakistan has a peculiar power demand curve. Since residential and commercial consumers drive the demand, the peak load on the grid is after sunset when the consumers turn on their air conditioning in the evening.

For example, in Karachi, the peak demand in the system is at 11 pm. This means that solar power does not help meet the peak demand, and the grid will still require other power generation capacity to meet the peak demand. Solar home systems will only help reduce costs for consumers.

Many upper-income households can afford solar installation, device replacements, and building improvements. Middle- and low-income families will find it challenging to make demand-side adjustments. Instead of investing in new power generation plants, policymakers should consider demand-side management measures and support low-income households.

Subsidising energy for all households is expensive and ineffective. Providing direct support to low-income households to adapt to future energy scenarios will be far more efficient. ■





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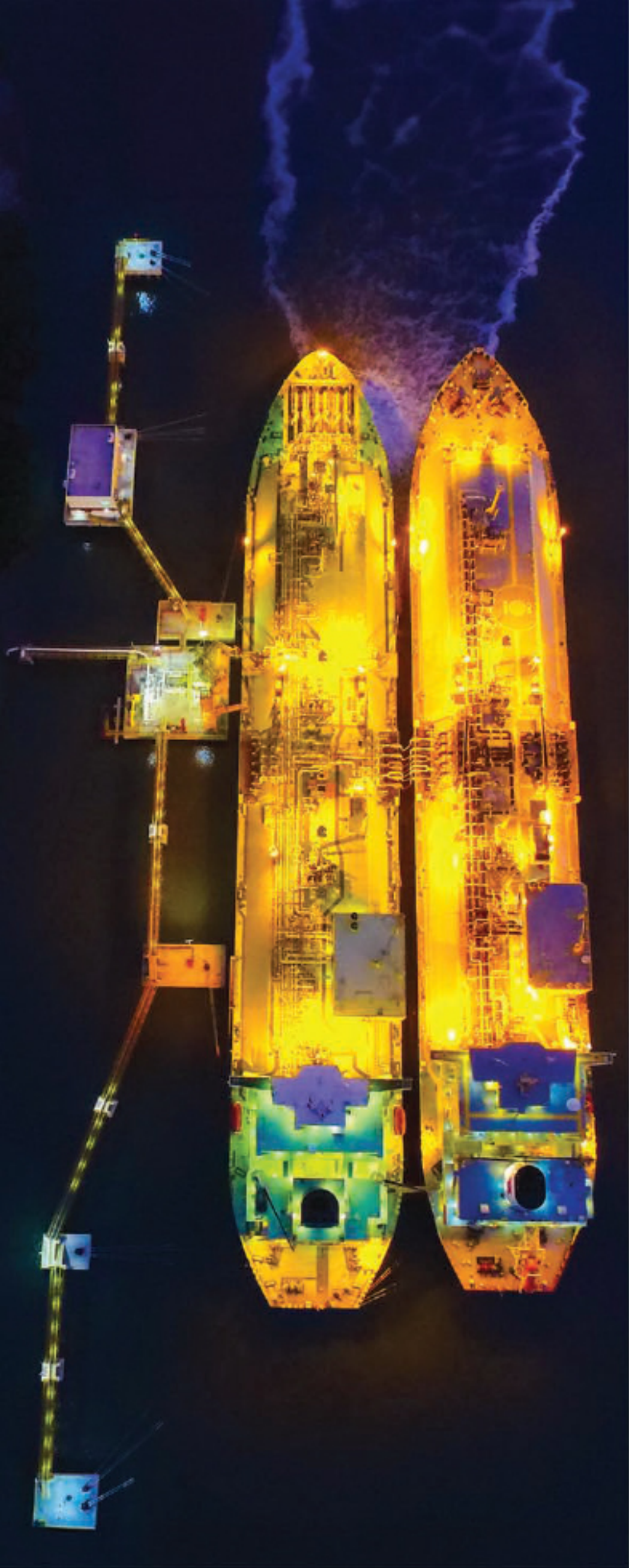
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