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ENERGY UPDATE

16th
ANNIVERSARY
EDITION



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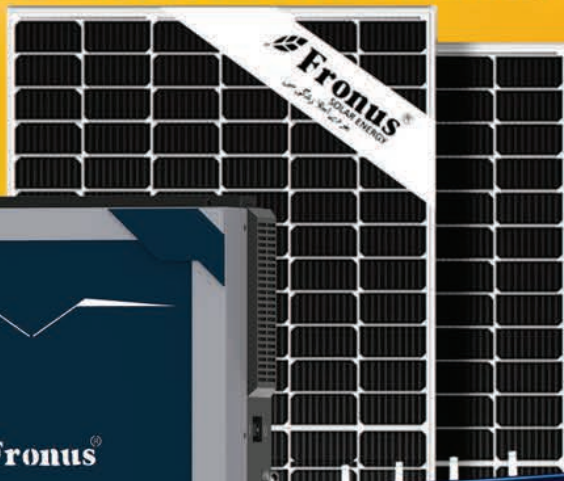
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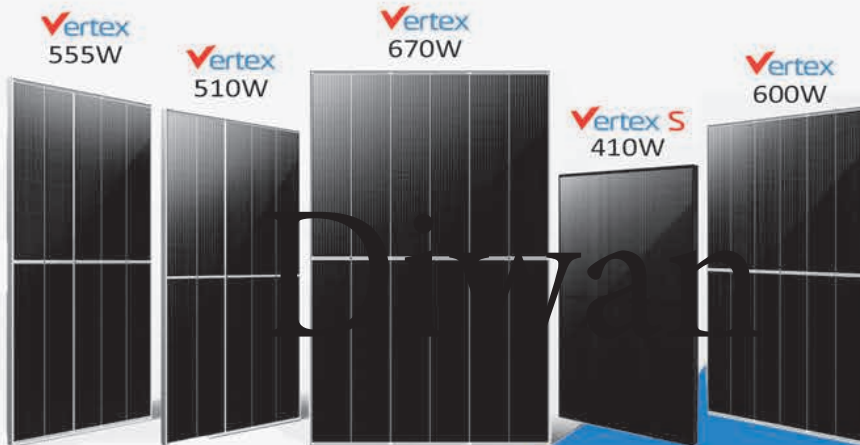
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Climate change causing water scarcity

Climate change has hit hard Pakistan, causing worst water crisis in its history. The country has been ranked in top 10 countries of the world, which are most affected by climate change in the past 20 years. The worst impact of the climate change in the country is ongoing worst water crisis while the population is also facing rising challenges of natural hazards like floods, severe heatwaves, droughts and cyclones.

Due to climate change-induced water scarcity, rice crop in Sindh could still not be sown while sugarcane and other crops in the country have been badly affected. As a result, growers and farmers will face heavy financial losses while the country is also likely to face food insecurity if water scarcity continues. Severe water-stressed conditions particularly in arid and semi-arid regions are impacting agriculture and livestock production negatively besides decreasing forest cover alarmingly.

According to a report by Pakistan Institute of Development Economics (PIDE), agriculture is the largest water consumer in Pakistan, accounting for 94 percent of annual water withdrawals followed by households (5.3 percent) and industry including power generation (0.8 percent).

The country's dependence on a single river system is extremely risky, as the Indus river system accounts for 95.8 percent of the total renewable water resources of Pakistan. Moreover, the water originating from outside of Pakistan accounts for over three-fourths (78 percent) of total water resources of the country, making it vulnerable. The Indus Basin aquifer has been ranked as the 2nd most over-stressed underground water reserve in the world. The strain on groundwater is very disturbing. Over 60 percent of irrigation, 70 percent of drinking water and 100 percent of the industry in the country depend on it.

Over 80 percent of the country's water resources are used by four major crops (rice, wheat, sugarcane and cotton) which contribute only 5 percent to GDP. The productivity of these crops is low in Pakistan compared to other major agricultural economies of the world, the report concluded.

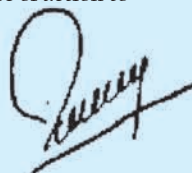
Sindh province is facing worst water scarcity in the country as compared to other provinces. The cotton crop has been sown on less than half of 500,000 hectares farm area in Sindh. The situation has turned so worst that even Tarbela Dam's water level has reached dead level, which is feared to further exacerbate water crisis in the province.

Despite having massive glaciers, mighty Indus and other rivers' water in Pakistan is depleting fast, while IMF has ranked Pakistan third among the countries facing severe water shortages in the world.

It is irony that despite worst water crisis, Pakistan's government and policymakers are sitting silent over this issue. They are always seen fighting for power chair, irrespective of which party rules. Fact is that they have done nothing good for water conservation and climate challenge tackling.

Water conservation is more important than that power chair for politician of Pakistan. There is dire need to awaken from deep slumbering. The government needs to improve barrages, canals and watercourses' system by cementing their banks across the country besides making arrangements to collect and store rainwater.

Some key recommendations are proposed signalling the need to adopt a more holistic approach towards water management and conservation, which takes into account the available resources, its usage, challenges and projected water requirements as well as future course of action to ensure that Pakistan is able to boost its agricultural productivity without drying out its water resources.



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16th ANNIVERSARY

ENERGY UPDATE

MESSAGES & FELICITATIONS

Syed Murad Ali Shah

Chief Minister, Sindh

I would like to warmly congratulate the editorial team of the 'Energy Update' publication on completing its 16 years. I am immensely pleased to know that 'Energy Update' is the only monthly print publication in Pakistan dedicated to covering the energy sector, operating from the capital city of Sindh- an energy-rich province of Pakistan and the host to the country's only wind corridor. However, we do need more such specialised publications focusing on the issues of energy in Pakistan... The Government of Sindh has been fully committed to utilising the abundant energy resources of the province and has been making all-out efforts to tap both, the conventional and the clean energy resources to maximize output and benefit the consumers. The maximum utilisation of the province's energy resources could ensure uninterrupted electricity at the most inexpensive rates to the power consumers not only in Sindh, but across the country. The Sindh government in pursuance of this mission joined hands with the private sector to undertake the historic project of extracting vast reserves of coal in Thar for massive electricity production. The government of Sindh also established, in a first, a provincial Transmission and Dispatch Company in the country. I would like to conclude by commending the Energy Update for achieving this milestone and pray for its continuous success.



Imran Maniar

Managing Director SSGC

It gives me great pleasure to felicitate Mr. Naem Qureshi and his team of monthly 'Energy Update' on 16TH anniversary of their magazine. In its journey of more than one and a half decade, Energy Update has carved out a reputation for offering global industry developments and informative articles to its readers. It is encouraging to note that through your periodical, country's energy sector enjoys a dedicated and well-round representation of perspectives and analysis. I am pleased to note that it is circulated to thousands of industry experts, worldwide. On behalf of SSGC, I warmly congratulate the editorial team of Energy Update for competing sixteen prolific years and wish that future brings even greater success as it continues its journey to shape the readers' opinions and thoughts.



Shah Jahan Mirza

Managing Director PPIB /
Chief Executive Officer AEDB

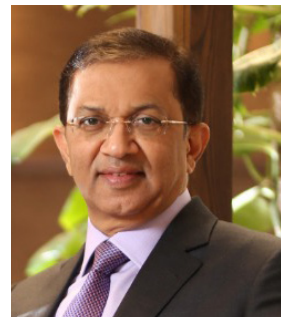
It gives me immense pleasure to felicitate "Energy Update", a leading energy magazine of the Country upon the special occasion of its sixteen (16) anniversary. Over this long period Energy Update keeps providing un-interrupted, impartial and highly professional views and stories on energy, power and related infrastructure. It has been recognized as a reliable publication on intricate issues and developments in energy sector. It has been providing platform to the experts for opinion exchange, knowledge sharing and to recommend pragmatic solutions on the grave issues being faced by this crucial sector. As Managing Director PPIB and Chief Executive Officer AEDB, two organizations which have been playing a crucial and leading role in implementing Government policies and plans for addition of sustainable and reliable generation capacity to national grid through private sector, I appreciate Energy Update for covering our various projects and related activities contributing in sustainable development of the country. Hoping Energy Update shall continue its valuable publication with same zeal and zest. I wish all the best to the Energy Update team for their future endeavours.



Ahsan Zafar Syed

CEO Engro Energy
Limited

We wish Energy Update every success in years to come and have confidence that it will continue to provide valuable information for passionate readers, playing their role in identifying the key aspects related to energy sector" The 'Energy Update' magazine being a dedicated energy vertical magazine continues to play an important role in shaping the narrative of our local energy industry for the last 16 years. The significance of media outlets cannot be under-rated and such publications provide a voice to specific issues of the energy sector. The magazine's consistent effort to provide information and updates on the latest developments in the sector allows different stakeholders to form a cohesive outlook on the industry. I would like to congratulate the entire team at Energy Update on its 16th anniversary!



Khalid Subhani

MD/CEO Message

Oil & Gas Development Company Limited (OGDCL) is the largest Exploration & Production (E&P) Company in Pakistan, listed on both Pakistan Stock Exchange and London Stock Exchange. OGDCL was established in 1961 under an Ordinance by GoP as a Public Sector Corporation and was later on converted as a Public Limited Company on October 23, 1997. OGDCL being the national oil company is committed in its resolve to bridge the prevailing energy demand and supply gap in the country. COVID-19 pandemic has adversely impacted the overall performance almost on each sector. However, like other industries E&P sector is also recovering from this phase. Similarly, OGDCL has shown a sharp resurgence and Company's Profit after tax stood at Rs.112 billion in the first 09 month of FY-2021-22 in comparison with the corresponding months of the year which stood at Rs.66 billion. Company was able to maintain capital and financial stability through discipline, while also acknowledging the favorable crude oil price environment. Happy 16th Birthday, EnergyUpdate!



Stefan Gsänger

Secretary General, WWEA

The world is at a turning point – after a century of industrial development based largely on fossil fuels, governments, communities and businesses are shifting towards locally sourced renewable energy. This shift is being driven by three current crises: the climate crisis which is forcing us to stop burning carbon-based resources; the Covid crisis with its multiple impacts, which is forcing governments to focus more on domestic supply chains; and the energy security crisis manifested e.g., in the war in Ukraine. The big change is a major challenge for the whole world and requires accurate and up-to-date information. Energy Update provides such information and plays a fundamental role in addressing the energy transformation in Pakistan and beyond. Congratulations on behalf of WWEA – we look forward to collaborating in the years to come!



Todd Li,

President Asia Pacific Region, Trina Solar

Congratulations to Energy Update on this very big milestone. Cheers to future achievements and past glories. It has been a wonderful journey altogether. As a leading PV company, Trina Solar has been pioneering solar technology for the past 25 years. As we celebrate silver anniversary this year with 100GW of PV modules being shipped to more than 100 countries, let's hope for the best in the coming years! We aim to foster a great relationship with Energy Update to jointly strive to become the 'green force' and contribute to building a carbon-free society in Pakistan.



Iqbal Z. Ahmed

*Chairman
Associated Group*

On the 16th anniversary of the publication of "Energy Update", Mr. Naeem Qureshi and his team deserve the highest praise for the effort put in by them to keep matters of energy in the limelight and update for the Sector Specialists and the general public. In these days of energy crisis and crunch throughout the world, Energy Update is playing an important role in keeping everyone informed and aware of the magnitude of the crisis and possible solutions. I wish Energy Update, Mr. Naeem Qureshi and his team the very best in future and hope that they will keep up this effort.



Wang Minsheng

CEO Karot Power Company Limited

It gives me immense pleasure to say that Energy Update is providing a great platform to Chinese Power Sector Companies, especially those working on CPEC projects. The Karot Power Company Limited (KPCL) is responsible for the construction & operation of the 720 MW Karot HPP located on the Jhelum River in Pakistan. We at KPCL are striving hard to achieve a timely COD for Karot HPP this year and provide Pakistanis with 720MW of clean and green energy. The success of the Karot Hydropower Project is all due to the hard-working Pakistani and Chinese engineers and workers, who made great sacrifices for the project to be in its final stages. The Karot hydropower project is invested by the China Three Gorges Corporation which is a global leader in renewable energy.



Muhammad Zakir Ali

*Chief Executive Officer
Inverex Solar Energy*

Congratulation to on your 16th Corporate Anniversary, it gives me immense pleasure to see your magazine grow with the industry, it is really heartening to see a Magazine with big circulation like Energy Update survive all economical seasons and keep us all up to date with what is going on in our industry, thank you for being part of our industry and our company greatly appreciate and value your presence. We wish you all the very best for future, keep up the hard work and enjoy your success.



Farhan Imdad

Vice President, Commercial

Electrification Business Area - Pakistan
ABB Power & Automation (Pvt.) Ltd.

"We heartily congratulate Energy Update and its entire team on magazine's 16th Anniversary and its well-deserved success. Energy Update has made a remarkable contribution in highlighting critical issues and developments in the Energy Sector and to cultivate the most interesting and relevant critical thinking in renewable and sustainable energy, in order to bring together the research community, the private sector and policy and decision makers. This magazine has done an excellent job in fulfilling its aim to share problems, solutions, novel ideas and technologies to support sustainable development and



the transition to a low carbon future. Energy Sector has an important role in the development of our country and especially with the rising awareness on digitalization, climate change-clean energy and shift to sustainable and green energy resources, the role of such publications is even more essential in ascertaining the way forward. ABB is a leading global technology company that energizes the transformation of society and industry to achieve a more productive, sustainable future. By connecting software to its Electrification business portfolio, ABB pushes the boundaries of technology to drive performance to new levels. With a history of excellence stretching back more than 130 years, ABB's success is driven by about 105,000 talented employees in over 100 countries. ABB, being the pioneer in power sector globally, has also been playing its part in Pakistan by implementing innovative solutions encompassing latest digital technology and round the clock services. We are working with all the major utilities, industries, infrastructure, and institutional customers offering power solutions from Power Generation to Socket and playing our part in the development of Pakistan.

Engineer Muhammad Naeem Khan

CEO Pakhtunkhwa Energy Development
Organization (PEDO)

It gives me an immense pleasure to acknowledge that Energy Update has become a leading energy magazine of the country which since 2006 has become a vital forum for bringing together cogent and competent voices from across the local and global energy world. The professionalism and hard work of the Energy Update team has made it possible to become one of the most popular and leading Energy Magazine of the country. The Energy Update Magazine is playing a very important role in organizing Energy and Environment related events which covers essential topics necessary for the country's policy making by bringing expert and sane voices on the round tables to discuss challenges and way forward to the challenges country is facing. Upon this occasion of successful completion of long journey spread over 16 years of valued publications, I am delighted to felicitate the Energy Update Team for providing reliable, impartial, and highly professional views and stories on Energy, power, environment and related topics to the readers. I am thankful to Energy Update for bringing us together in the resolution of different challenges in the energy sector and giving coverage to the Energy and Power related activities of the Government of Khyber Pakhtunkhwa. Finally, I wish Energy Update Management and team to continue with the current successful streak of "Energy Update" in the years to come and I am hopeful that this magazine will play its role in facilitating the decision makers through productive discussion on the challenging topics of the Energy & Power related challenges.



Meng Donghai

CEO of Thar Coal Block-1 Power Generation Company (Pvt.) Ltd.

On behalf of Thar Coal Block-1 Power Generation Company (Pvt.) Ltd., it is with great pleasure we express our sincere and heartfelt congratulations to Energy Update Magazine on its special 16th Annual Anniversary. Throughout these years, Energy Update has been a great vehicle in providing regular and consistent updates on the energy related issues and opportunities, and it is an indispensable source of knowledge and guidance on the national economy. We wish it greater success in times to come.!



Howard Fu,

Country Director of Pakistan, Sungrow

Upon the 16th anniversary of Energy Update, Sungrow's valued media in Pakistan, I extend my sincerest gratitude to your professional and considerate support and contribution to Sungrow's promotional efforts in this emerging and potential market all the way. I also offer my best wishes to your growing influence and coverage to more parts that play a role in Pakistan's energy industry and beyond. At Sungrow, we consider Pakistan a strategically significant market and is expanding our investment into it. We offer a full range of inverter and storage solutions for Pakistan SME market. In the future, we look forward to deepening and diversifying our cooperation with more influencers in Pakistan like Energy Update.



Mohammad Wasi Khan

Chairman, Cnergyico Pk Limited

I would like to congratulate Energy Update Magazine on delivering the important news and insightful analysis for the last sixteen years. In this period, the global energy industry has gone through major shifts due to technological advancements and a growing need to address environmental concerns. Pakistani companies are recognizing increasing importance of ESG factors and some, like Cnergyico, are participating in decarbonization efforts. At Cnergyico, we have a longstanding commitment to environmental stewardship dating back to the origins of the company. We have carried one of the country's largest tree plantation drives in the private sector and are investing heavily to produce more environmentally friendly fuels. Energy Update Magazine has done an impressive work of showcasing climate risks, and I hope the publication will continue to provide news and commentary about how the petroleum companies in Pakistan are adapting to the low-carbon economy.



Mohammed A. Rajpar

Former chairman, Pakistan Ships Agents Association & Managing Director, General Shipping Agencies

I am delighted to learn about the 16th anniversary edition of monthly Energy Update magazine which keeps its readers updated about the developments in global energy sector in general and Pakistan in particular. With factual reporting, balanced criticism along with rigorous analysis, and open to comments and suggestions, Energy Update is read by policy makers, experts and those who wish to keep abreast with what is happening in the energy sector. Best wishes on achieving an important milestone to Energy Update as well as for its future endeavors.



Saleem Shaikh

CEO STDC

It is a moment of an immense pleasure for all of us to participate in the Energy Update's 16th anniversary Edition. Being a CEO of STDC and having an extensive experience of more than 30 years in the power sector, I personally commend the idea of Energy Update Magazine of regularly keeping the sector market players well acquainted of the recent developments in the industry. The Energy Update team plays a vital role in conducting seminars and webinars in which the leaders and pioneers of the electric power industry share their success stories by participating in the events. STDC has always contributed in events organized by Energy Update Team related to the power sector specially green energy and importance of renewable energy and will also keep participating in future as well. I congratulate the entire team of Energy Update for their successful journey in establishing a platform for bringing energy related matters into discussions which has kept sector players united and updated under the banner called 'Energy Update'.



Mian Fahad

Country Manager, Pakistan Growatt

I, on behalf of Growatt, would like to extend my heartiest greetings to the Energy Update (EU) on the 16th anniversary of its publication. No doubt, the EU through its constant publications, digital content, and events has been playing a vital role in the power sector of Pakistan. The EU has been excellently playing its role to promote the views of the energy industry of the country. The EU deserves praise for becoming a vibrant platform for the concerned stakeholders of Pakistan's power sector to express their opinion, thoroughly discuss issues of their industry and make efforts to find solutions. The energy sector of Pakistan has benefited a lot from the in-depth analysis and balanced perspectives, and insightful dialogues conducted by the EU. The EU's contribution to developing our power sector is simply matchless. I wish resounding success to the EU in all its future endeavours to promote the energy sector of Pakistan.



Adnan Sheriff

Director, Technical Sales and Marketing Jubilee Corporation

We appreciate Energy Update Team for their contribution in the energy sector through its publications and participations in various national conferences. For over 15 years, the magazine has been providing valuable content related to energy industry bringing competent and rational voices, industry insights and updates from the local and global energy sectors. On behalf of Jubilee Corporation, I congratulate Energy Update team and Editor-in-Chief Mr. Naeem Qureshi on the 16th Anniversary and wish them success ahead.



For latest development on Energy & Environment Sector log on to:
www.energyupdate.com.pk

M. Imran Halim

Chief Engineer Renewable Energy Projects (IPP/PPP), Pakhtunkhwa Energy Development Organization (PEDO)



It is my honor and privilege to felicitate the Patrons, Editors, team members and Management on publishing 16th edition of "Energy Update" Magazine. In these 16 long years journey, which started in 2006, the magazine has played a vital role in the energy outlook of the country by bringing up inspiring success stories and way forward to the different energy & power sector challenges through events, discussions, publications and by introducing leaders in the energy sector to the valuable readers of the magazine. The magazine has provided a platform to the policy makers, developers, investors and research & development professional which has Energy Update one of the leading Magazine of the country where the readers are not only from Pakistan but around the globe. Energy Update is providing reliable, un-interrupted, interesting, innovative and highly professional publications to the readers, which is not only available in hard copies but online for the readers around the globe. Arranging different events, debates, discussions, awareness campaign, publishing quality material have made Energy Update the

only sane voice in the Energy & environment sector of the country which has given a positive outlook of the country not only to the local readers but to the international community as well. I warmly congratulate the editorial team of Energy Update for completing 16 prolific years and wish that future brings even greater success for the magazine and expect that it will continue to enlighten the readers with the same zeal and enthusiasm by providing such a great platform and quality publications.

Amir Iqbal

CEO SECMC



Over the past 16 years, the Energy Update magazine has been an active and reliable source of information on all the latest developments in the energy industry of Pakistan. The magazine continues to play an important role in creating dialogue and awareness on critical issues

pertaining to the energy sector of the country. I would like to extend my sincerest felicitations to the entire team at Energy Update on its 16th anniversary and wish them the best of luck for their future endeavors.



LONGi has a long-term commitment to investment and contribution in Pakistan

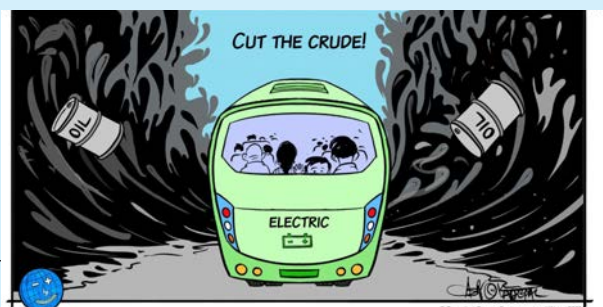
LONGi is the world's leading solar technology company. It officially entered the Pakistan market In 2019. In three years LONGi went from 1 MW to 500 MW relied on its high-quality, reliable solar modules, and Firmly towards the goal of IGW with all partners. As the most valuable solar PV solution company in the world, LONGi has never forgotten its social mission, never forgotten the truth that it's our partners and customers in Pakistan always trust and support LONGi strongly. During Ramadan, LONGi celebrated the festive and share the food with the people together in Lahore and Islamabad. LONGi and team Pakistan felt more mission and responsibility when they get food into the hands of people. LONGi shows its determination to continue to take root in Pakistan, help to accelerate the clean energy transition, provide more jobs with partners and contributed more CSR activities directly.

Yusuf Saddique

CEO EVTL & EETL



Rapid depletion of indigenous gas reserves over the last two decades has been a subject of growing concern and multiple mitigation efforts have been made, albeit to very limited avail. This, coupled with persistence of gas demand in Pakistan, calls for an increased level of LNG imports. Today, gas addresses -35% of Pakistan's energy needs. Textile, being the largest export sector worth more than USD 15 billion, relies majorly on gas, while gas accounts for 27% of Pakistan's power generation (17% LNG based generation). Not only is LNG important as Pakistan strives to stimulate economic growth and manage its steeply increasing population's energy needs, the importance of LNG imports is also amplified by the challenges that alternate sources of energy bring forth (e.g., LPG and renewables)





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Charter of Energy?

Tabish Gohar

FAs Pakistan suffers yet another “energy crisis”, it is worth asking as to what should be done to avoid history repeating itself all too frequently. To be fair, the recent commodity super cycle, compounded by the war in Ukraine, is stress testing even the more developed energy ecosystems worldwide. However, our own sectoral fault lines are structural in nature and cannot be blamed on external factors alone. It would, therefore, help to first understand the real issues and then try to develop a political-cum-bureaucratic consensus on a holistic solution beyond the ongoing binary debate on maintaining (or reversing) the current unsustainable power and petroleum subsidies.

First and foremost, Pakistan’s energy sector must be liberalized and run autonomously by regulated companies, private or public. This would be a paradigm shift in thinking and approach but does NOT mean granting cart blanche freedom to unscrupulous private cartels to “loot & plunder” the common man, and create artificial supply shortages at will, as is sometimes feared. For the State to cede political and pricing control of such “essential service”, it means restricting its role to consistent policy making alongside strengthening independent regulatory oversight of the licensees to enforce competitive consumer pricing, reliability of supply and a level playing field, as generally experienced in the telecom sector post liberalization. What that practically implies for the energy sector is illustrated by the following four propositions:

1) There is no reason for the Prime Minister of Pakistan to intervene in the market to set fortnightly petroleum prices when the same can be done more effectively on a petroleum commodity exchange matching supply and demand in real time, with PSO (the state-owned oil marketing company with the largest footprint) effectively setting the pricing benchmark. Whether it is for petroleum or electricity, a political government will always retain the policy toolkit to reduce indirect taxes and levies on various energy products or offer funded subsidies to targeted

socio-economic segments of the population directly through its social welfare programs (BISP/Ehsaas) or to the export oriented industrial sector. If the market is deregulated, there may also be no need, for instance, to offer special incentives or subsidies to the local refineries to optimally invest in upgrading and moderniz-

ing their existing assets to enhance our energy security.

2) The management of all state-owned power distribution companies must be handed over to the private sector, under a transparent process run by the Privatization Commission, alongside a more equitable financial and risk sharing



arrangement with the provinces per the spirit of 18th Amendment and NFC Award. The federal government must finally realize that it cannot centrally run these local “last mile” businesses from Islamabad whilst bearing 100% of their financial burden. Let the private concessionaires be regulated and incentivized by NEPRA, under a multi-year tariff regime, to invest in well-identified technical solutions to reduce the aggregate technical & commercial losses and improve customer service at these DISCOs.

- 3) All new power projects, except perhaps hydro and nuclear, should henceforth with competitively tendered and their electricity traded on the upcoming power commodity exchange (CTBCM) and/or wheeled to private wholesale customers without any sovereign offtake guarantees. The policy makers, therefore, need to show some spine in resisting the rent-seekers’ desire

to maintain status quo and finally discard the single-buyer model (chiefly responsible for the sector’s paralyzing circular debt) in favor of a market based multi-seller, multi-buyer structure.

- 4) The State needs to get out of further LNG business and let the private sector procure the molecules internationally at its cost and risk, regassify those at the existing and future FSRU terminals, and sell the gas to industrial and commercial customers at deregulated prices via the Sui pipelines (under third-party access rules) or cryogenic bowsers. The federal government should only be concerned with the supply and allocation of locally produced natural gas per its stated socio-economic policy and constitutional provisions.

Secondly, the dominant reason for the power sector’s debilitating Circular Debt is not DISCOs’ losses but the unaffordable, and continually increasing, input cost of generation due to various policy decisions from the 1990s onward. One can debate forever as to whether we contracted too much and too expensive IPP capacity under a “take or pay” arrangement but that is all water under the bridge. The choice we now have is to either convince the IPP financiers to restructure their existing project debt by extending tenor and reducing margin, or to transfer a portion of such “stranded” sectoral cost from the consumer electricity tariff into public debt. Whilst there is no free lunch and the latter option may appear to be a zero-sum accounting ploy, it will however improve the competitiveness and sustainability of the overall power sector with potential collateral benefits for the entire economy.

If the energy market is properly liberalized under a regulatory framework, the public should benefit with cheaper and more reliable electricity and gas; however, some of our state-owned enterprises (such as DISCOs and the Suis) will go under if they remain obliged by the State to subsidize the left-over customers whilst continuing to bear the full economic burden of previous policy sins and errors. Such legacy, and indeed future “strategic”, costs should therefore be absorbed over the entire GDP as a budgetary line item. Building and maintaining a Strategic Petroleum Reserve infrastructure that could be used judiciously by the

State during force majeure events, or to manage extreme volatility in the market as we saw during Covid, is another such example.

Finally, tacking climate change and achieving energy independence should be a key policy focus for the State. Not just for environmental but also economic and energy security reasons, we must develop and implement a holistic road map to achieving “net zero” carbon emission by 2050 or thereabouts. This goes beyond a 60% renewable energy target by 2030, our aim should be close to 100% power generation from wind, solar, hydro, and nuclear plants by mid-century. “Green” hydrogen (and associated ammonia for urea production) can also be part of the decarbonized energy mix as we are endowed with plentiful sunshine and wind in certain zip codes, the capital cost of electrolyzers is reducing worldwide, and international green financing is available for such ventures. Even without GOP subsidy support, albeit under a policy framework, the private sector can launch e-mobility in the commercial space (buses, rickshaws & motorcycles) to reduce imported diesel and petrol consumption and pollution. Electrification of domestic & commercial space heating (via heat pumps or AC inverters) to save indigenous gas usage in the winters also requires appropriate differential pricing signals and green consumer financing options. Likewise, energy efficiency standards & conservation (via new building codes, for instance) already exist on paper but not yet fully implemented. The World Bank and other multilaterals could finance the early buyout of existing oil-fired IPPs if the sale proceeds are ploughed back by their sponsors into replacement renewable energy assets under a NEPRA-determined tariff regime.

There will, however, still be need for hydrocarbons in the “hard to abate” sectors of the economy. If there is one, and only one, additional energy project under CPEC, it should be to convert Thar coal into synthetic natural gas (95% methane) and potentially other petroleum products. The technology already exists, with CO₂ abatement, and at \$25 per ton coal price the end-product should be competitive against imported LNG, if we can secure long-term concessional financing from China, alongside net FX savings in the long run. Concurrently, with imported coal at \$300+ per ton, it is also critical for us to expeditiously link the existing imported coal power plants to Thar via railway lines.

In conclusion, there are no magic solutions or low hanging fruits to instantaneously “fix” the energy sector. What we need is clarity and “buy in” on a few fundamental governance principles and a granular road map and set of work streams implemented consistently over the next 3-5 years to make this sector a net positive contributor to the national economy whilst providing affordable and reliable energy products and services to the people of Pakistan.



India-Pakistan water ties Climate change creates new issues

They go beyond scope of Indus Water Treaty

— Ali Tauqeer Sheikh —

Climatic change has created many new issues for India-Pakistan water relations, and they go beyond the scope of the Indus Waters Treaty (IWT). These issues reflect an epochal shift in the economic, social and ecological health of the Indus basin.

Since Pakistan gets almost all of its surface water from its neighbours, it is important to explore policy options and determine implementation mechanisms for the future water security of the federation and all federating units to ensure that the shared water resources are climate-proofed to serve as a source of cooperation.

The IWT is now exposed to several climate change-induced stresses. It poses a wide range of threats to freshwater resources — the country's lifeline — by threatening water quantity, quality and system operations as well as creating new governance complications. The challenge is how to integrate information on future hydro-climatological conditions into the

politically complex system of a transboundary water agreement. The treaty presently lacks important tools for dealing with the changing social, economic and climate conditions, but, mercifully, Article 7 of the treaty has provisions to deal with the issues that have emerged in recent years.

India and Pakistan are not the only states to share transboundary water resources with their neighbours. Nearly half the global population is believed to rely on transboundary waters. Political borders and boundaries are rarely defined by water bodies; innumerable rivers, lakes and groundwater aquifers are shared by two or more nations.

A UN assessment mapped 214 such shared basins. A registry, prepared by Prof Aaron Wolf in 2003, identified over 260 major transboundary river basins shared by not less than 145 countries. In this otherwise conflict-ridden world, well-managed water agreements are the anchors of stability — an

estimated 300 agreements govern multi-state transboundary water rights. Some riparian countries have begun to revisit their accords in order to find mutually beneficial responses to climate-induced challenges. Are there any lessons for the IWT signatories?

The Indus Waters Treaty between Pakistan and India is exposed to many climate-induced stresses.

Globally, most water agreements and treaties are extremely diverse in their approaches and solutions. Unlike IWT that has divided rivers between India and Pakistan, almost all water agreements share waters based on fixed or flexible volumetric allocations.

Some accords have also covered groundwater or aquatic resources while others, like the IWT, have not. Many transboundary agreements have provisions for floods, some for droughts, and fewer for both. The Ganges Water Treaty between Bangladesh and India, for example, has provisions to share water during drought periods. The Joint Water Commission supports their bilateral treaty with studies and reports on sharing of waters, irrigation and flood and cyclone control.

Likewise, the Permanent Joint Technical Commission on the Nile basin can make recommendations for new water allocations in



response to drought. In other words, the need is to gear up for managing the anticipated scarcity rather than just dividing water that is presently available.

Extreme weather events (EWEs) have become increasingly frequent and fierce, overly exposing countries like Pakistan to high risks and damage. Instead of signing new agreements, the experts have favoured building upon the existing instruments to respond to EWEs, hoping that this would, over time, improve the scope of existing water agreements and make them climate-smart. At the heart of such endeavours is the desire to cope with changing climatic conditions by crafting flexible water-management strategies.

For India and Pakistan, climate-induced hydrological and hydro-climatological variabilities are upsetting historical trends. As climate change alters the monsoon system, past climate conditions are a less reliable predictor of the future. But the IWT is based on the assumption that future water supply and quality will not change.

Experts recommend many mechanisms that can be incorporated into existing systems to allow for flexibility in the face of climatic changes. Four main global trends merit a closer review: i) devising response strategies for EWEs — floods, drought, tropical storms or cloudbursts, ii) reviewing water-quality standards to arrest water degradation that has become particularly detrimental for the existing and future infrastructure, iii) exploring changes in monitoring and review procedures to jointly deliberate over shared climate concerns to enhance the effectiveness of the IWT, and iv) strengthening joint management institutions, particularly the India-Pakistan Permanent Indus Commission.

The commission barely meets twice a year, and then primarily to exchange Pakistani objections and Indian rebuttals on the proposed infrastructural projects. This zero-sum approach cannot keep the treaty alive.

It is important for both India and Pakistan to view the IWT in its historical context and take a leap forward towards the contemporary context. This was a post-partition gift and an opportunity to make the new country a viable entity for an agrarian economy. We know now that cheaper solar and wind energy has diminished the need for India to construct a chain of dams to allow the free flow of the Indus. In fact, if the two countries cooperate, the existing upstream reservoirs in India can serve as water banks for drought periods in Pakistan.

It is in our interest to ensure that the Permanent Indus Commission meets more frequently than the minimum required in the treaty; it should constitute ad hoc expert groups and sub-committees to table climate-smart options. An otherwise robust water treaty should not become hostage to weak institutions and an unimaginative treaty implementation strategy by either side. Both countries need to consider a ministerial-level commission to revitalise the IWT by formulating a refreshed bilateral water agenda. The present period of poor relations is probably the best time for such an initiative. ■

The writer is an expert on climate change and development

PTPL plant

Gas supply on priority demanded

◆ Mushtaq Ghumman ◆

Priate Power & Infrastructure Board (PPIB) has urged the Power Division to direct NTDC to include 1263 MW gas-fired power plant near Trimmu Barrage Jhang in its priority list.

Punjab Thermal Power Pvt. Ltd. (PTPL) is developing a 1263 MW combined cycle power plant near Trimmu Barrage Jhang, with 87% construction completed and commissioning in progress. The Project was expected to achieve open cycle operation in March 2022 and COD in combined cycle mode by end of July 2022.

In a letter to Power Division, Managing Director PPIB, Shah Jahan Mirza, said that as communicated by PTPL through its letter of April 15, 2022, the pre-synchronizations tests have been completed and the Gas Turbine is ready for commissioning since March 24, 2022 but it could not proceed forward due to non-availability of RLNG.

Citing importance of the project and that the delay in gas supply may cause huge financial loss with a potential risk of work suspension at site, PTPL has requested for RLNG supply to complete plant commissioning at the earliest.

The project is using advanced technology machines with more than 61% efficiency and can generate cheaper electricity upon commissioning, compared to old power plants which have lower efficiencies. Moreover, the project is expected to enhance system stability, particularly in FESCO area, which makes it more important especially during the summers.

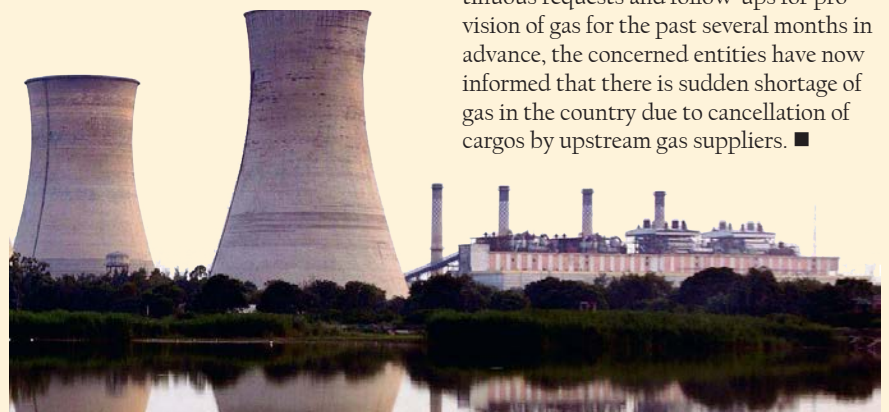
He said, PPIB understands that the

instructions to divert gas from the allocated quota for power sector are to be made by NPCC, after which gas will be supplied by SNGPL. In view of existing scenario, he requested that NTDC may be directed to include PTPL Project in its priority list for gas allocation and advise SNGPL for supply of RLNG to PTPL project, so that the commissioning is completed at the earliest and PTPL project starts contributing power to the national grid.

Earlier, Dr Salman Zakariya, CEO PTPL, wrote a letter to MD PPIB saying that the project has reached an advanced stage after strenuous efforts. Currently, there are around 1800 workers and experts are at site whereas equipment worth \$ 416 million is installed. The resources are arranged amidst COVID-19 situation with delay in execution of concession agreements and achievement of financial close by more than two years. However, despite being ready from all aspects, the commissioning works could not proceed due to non-supply of gas by SNGPL and NPCC. The contractors have already started mobilizing certain resource from the site.

He maintained that delay in COD due to non-supply of gas will result in financial loss to government of Punjab (GoPb)/ public exchequer to the tune of approximately \$ 1.5 to 2 million per week. Further, claims by the EPC Contractor are imminent. There is also potential risk of suspension which will jeopardize the project of over Rs100 billion if the gas is not made available to PTPL. This will also deprive national grid from availing power from a highly efficient facility (61.16%) and to mitigate the system constraints in 220 kV FESCO transmission system.

Zakariya maintained that after continuous requests and follow-ups for provision of gas for the past several months in advance, the concerned entities have now informed that there is sudden shortage of gas in the country due to cancellation of cargos by upstream gas suppliers. ■



Karachi to get advanced waste- to-energy facility

Evert Lichtenbelt
Harvest Waste CEO

—◆— Mustafa Tahir —◆—

Karachi will get the best and most advanced waste-to-energy facility in the entire Southeast Asian region, says Harvest Waste CEO Evert Lichtenbelt in an exclusive interview to the Energy Update.

Harvest Waste is a Dutch company, which is part of an international consortium. This company recently signed an agreement with the Sindh government's Energy Department for launching for the first time a waste-to-energy plant in Karachi.

In the interview, Mr Lichtenbelt talked about the experience of his company in running waste-to-energy facilities and their plan to build one such plant in Karachi. Following are the important excerpts of his interview for our readers:

Energy Update: Tell us about your company and its experience in converting waste into renewable electricity?

Evert Lichtenbelt: We are one of the members of the consortium that has signed an LOI with the Sindh government's Energy Department for launching the waste-to-energy project. The goal of this project is to tackle mainly two problems: one is to tackle the waste problem and the second is to produce base-load renewable energy. Our company is

going to act as the technology supplier and operator of the plant. We are a Dutch company as in the Netherlands we have had a waste-to-energy facility for over 100 years.

The technology has greatly evolved since the time we started using it. We own a technology, which is much more efficient than the one used by our competitors to run the waste-to-energy plants, and therefore produces more energy per tonne of waste. The waste-to-energy option not only tackles the waste problem but also converts the waste into steam that in turn could be used for producing electricity or could be consumed by the processing industry. But the objective here is to produce as much renewable electricity as is possible. We have a vast experience in this field in the Netherlands. We will build a waste-to-energy facility in Karachi for processing 1,500 tonnes of waste every day. It would be residual waste that couldn't be recycled. The waste would be used to produce 40 to 50 Megawatts of base-load clean electricity.

EU: What possible difficulties you are

expecting to face while operating a waste-to-energy facility in a city like Karachi where trash is not sorted out and segregated before disposal?

Mr Lichtenbelt: Characterization of the waste is very important for designing the plant, so first of all you need to know what you are going to get as input for the power plant. The composition of the waste could vary. You, however, could do engineering for tackling this issue. Therefore, we have accordingly engineered our plants in Vietnam, Indonesia, and India. We have a plant under development in Palestine where the contents of the waste are very dry. So you need to do engineering for tackling your inputs. If there is any need, a facility could be built to pre-treat the waste before processing it for power generation. Contents like sand and bricks have to be separated from the rest of the trash as they add nothing to the process of renewable electricity generation.

EU: How much time you are required to execute this project in Karachi?

Mr Lichtenbelt: After the LOI, you need



Energy wheeling termed key to KP progress

Energy wheeling and industry academia linkage should be prioritized for improving business regulatory environment in Khyber Pakhtunkhwa, say experts from public, private sectors, and academia, said this during the hybrid public-private dialogue on "Better Business Regulatory Environment in Khyber Pakhtunkhwa", organized by Sustainable Development Policy Institute (SDPI) and National Network of Economic Think Tanks (NNETT) in collaboration with the University of Swabi.

Javed Khattak, CEO, Khyber Pakhtunkhwa Economic Zones Development and Management Company (KPEZDMC), on the occasion highlighted several initiatives of the government for providing relief to the businesses. Such measure includes keeping the units operational during COVID-19, financial institutions' reforms, regulatory easing, and manufacturing base enhancement, he added.

Ms Shamama Arbab, Chairperson, Pakistan Stone Development Company (PASDEC), stressed the need for innovation through active and effective industry-academia linkage.

Dr Waqar Ahmed, Joint Executive Director, SDPI, emphasized on the importance of ease of doing business in Khyber Pakhtunkhwa. Presenting detail of the economic challenges resulting through local and regional political crisis, Dr Ahmed specifically mentioned Afghanistan-Pakistan Transit Trade, and the impact of international inflation on the cost of doing business. The policy and regulatory relief from the government based on these factors should be prioritized, he added.

Representing academia, Dr Azmat Hayat from University of Malakand, Dr Javed Iqbal from Abdul Wali Khan University, Mardan, Dr Sufyan from University of Swabi, and Mr Samiullah, presented various suggestions including establishing centers of excellence and creating effective linkages with the academia. Earlier, Ahad Nazir of SDPI presented various aspects including challenges and consultations for effectiveness as a way forward.

Project coordinator, Durshal, Khyber Pakhtunkhwa Information Technology Board, Pir Amad Ali Shah; Waheed Khan from Khyber Pakhtunkhwa Environmental Protection Agency; and President of the Swabi Chamber of Commerce and Industry (SwCCI), Muhammad Israr, also spoke on the occasion. ■

to achieve financial close within the next 18 months. In these 18 months, you need to do all the engineering, procurement, and funding for the project. Also, all the permits required to execute the project are also obtained during this period, so the government has to play an important role in meeting all these timelines. We hope to do all this swiftly. Then you need to construct the plant. The good thing about Pakistan is that you could produce anything here locally. So hopefully, we are able to construct the plant within 30 months and then make it operational.

EU: Tell us about your plan to follow the environmental safety standards while operating this plant in Karachi?

Mr Lichtenbelt: We always fully adhere to the same environmental standards as we adhere to running our plant in Amsterdam. This means that we follow the environmental safety standards, which are more stricter than the emission control protocols of the European Union. So the emissions coming out of the stack of the plant will be completely harmless. It is our solemn commitment that wherever in the world we execute any project, we never compromise on the environmental standards. We used to say in Amsterdam that the air coming out of the stack is cleaner than the air in the city, so we will hold this true for Karachi as well.

EU: What cooperation do you need from the government to build this project?

Mr Lichtenbelt: You mainly rely on the government for issuance of the permits, delivery of the waste, and off-take of the electricity to be produced by the waste-to-energy plant. You build a facility, which processes the residual waste for the production of clean electricity so that the waste should be delivered by the local agencies and electricity to be produced by the plant should be procured by the government. You rely on the local government for the delivery of the waste, then you depend on the provincial government for all the permits required for building and operating the plant including the environmental permission, and then you need the federal government's help

as base-load renewable electricity production could come under its domain. Hence, you need cooperation from all the levels of the government for making the project successful and bankable.

EU: Tell us about the socio-economic benefits of this project?

Mr Lichtenbelt: These waste-to-energy facilities have a huge negative CO₂ impact, so these plants are good for the environment as we avoid a lot of harmful greenhouse emissions. These plants have also been helpful in generating a lot of employment opportunities locally so their socio-economic impact is huge.

EU: What are your expectations regarding the availability of local manpower for operating this plant?

Mr Lichtenbelt: I have been to Pakistan many times and every time I'm surprised to see the level of education and capabilities of Pakistanis. Our plan is to build a training centre along with the construction of the project to train local people to operate the plant. Initially, we will operate the plant on our own and at the same time provide on-the-job training to the local people to operate the plant. Rest assured that the project to be executed in Karachi is going to become the best and most advanced waste-to-energy plant in the entire Southeast Asian region.

EU: What is your best advice to the people of Karachi regarding their waste disposal practices?

Mr Lichtenbelt: My advice to the people of Karachi is that they should adopt the practice of disposing of their waste properly. They shouldn't throw their waste on the streets and in the open, or burn it in their backyards. They should properly separate the contents of their waste before its disposal. The waste should be disposed of in a manner that it can be properly collected and come to us for using it for clean electricity generation. As long as the waste is properly collected and comes to us for proper disposal, then it generates the least negative impact on our environment. But the important thing is that we as responsible citizens should generate less waste as much as possible. ■

No shortcut to power woes

Indigenous coal can be our saviour: SECMC chief

◆ Nasir Jamal ◆

If there's one lesson Pakistan's policymakers can learn from the ongoing tumult in the international energy markets, it is to look for economical and reliable substitutes to the expensive import-based fuel mix for tackling longstanding power sector challenges: availability, affordability and accessibility.

Energy prices have shot through the roof and suppliers cancelled their long term contracted LNG shipments on Covid-related supply chain disruptions exacerbated lately by the Russian-Ukraine conflict, underlining how vulnerable Pakistan's energy security is to the global price and supply volatility.

The previous Nawaz Sharif government had attempted to address the energy security challenges by encouraging relatively cheaper coal and gas imports for electricity production and industrial use. The policy made sense at that time due to the lower prices of these fuels. Imported coal was available for much under \$100 per tonne and LNG at approximately \$10-13 metric million British thermal units, until the recent commodity supercycle pushed energy prices to climb new peaks. Simultaneously, it also sought to exploit indigenous coal discovered in Thar and renewables to cut reliance on fuel imports.

Nawaz Sharif was successful in removing generation capacity bottlenecks with the help of massive Chinese loans, but he was unable to address challenges of affordability and accessibility due to overdependence on imported energy for power production.

The country accrued economic losses of around 2pc of GDP per annum owing to crippling power shortages in the late 2000s and 2010s. Are we headed there again?

Among other factors, ballooning energy imports are significantly contrib-

uting to the current account deficit and accumulation of fiscally unsustainable debt in the energy chain, or 'circular debt', to over Rs2.3 trillion in nine years.

Rising global energy prices also forced Imran Khan to cap the prices for four months through June to provide temporary 'relief' to the people to win over their support ahead of a no-confidence vote called to remove him from power.

According to official estimates, the country accrued economic losses of around 2pc of GDP per annum due to crippling power shortages in the late 2000s and 2010s. Have we headed there again? Most likely unless we pull our act together.

With indigenous gas reserves forecast to run out in a decade, Thar lignite is the only viable option for Pakistan to pursue to displace imported fuels for sustainable economic revival. Many of us would like to see the development of clean, renewable energy sources to replace dirty

fossil fuels. But that isn't possible in near future.

That leaves us with the only option of using Thar lignite reserves whose heating value, according to Sindh Engro Coal Mining Company (SECMC) CEO Amir Iqbal, is estimated to be greater than the combined oil reserves of Saudi Arabia and Iran. Thar lignite is the cheapest indigenous energy resource with its 175.5 billion tonne reserves having the potential to produce over 100,000-megawatt electricity for 30 years to help make Pakistan's energy self-sufficient.

"The recent energy market disruptions and the sharp spike in fuel prices should be a wake-up call for us," says Mr Iqbal. Currently, 3.8 million tonnes of lignite are being extracted annually from



Thar, supporting the production of 660 megawatts from the mine-mouth power plants. The coal production is billed to double to 7.6m tonnes by the end of this year and 12.2m tonnes by the end of next. So will mine-mouth generation capacity accordingly.

Thar lignite is costing \$60 per tonne now. The planned increase in coal production will bring the price to under \$50 by the end of this year and below \$30 before the close of next. "This compares with imported coal rates that recently spiked to well above \$420 from around \$100-120 per tonne due to the commodity supercycle," Mr Iqbal says, pointing to massive dividends the shift to indigenous coal can bring to the dollar-starved government in the form of foreign exchange savings and consumers through a huge reduction in generation cost while sustainably reviving the economy. "Besides, it will also shield us from global energy supply disruptions seen in the recent months," he argues.

In Pakistan coal power constitutes just about 12pc of the total generation capacity of over 39,700 megawatts. In comparison, in countries like China, India and the US, where base-load demand is high, coal power dominates their energy profile. India coal accounts for 65pc of the energy mix and it is planning investments worth billions of dollars in coal projects to exploit domestic lignite sources and curb fuel imports.

The cost of electricity being produced by Thar coal is Rs18kWh (kilowatt-hour), which will drop by a third to Rs12 in two years once lignite cost reduces with the expansion in its extraction. This compares with well over Rs30kWh generation price for the Sahiwal plant using imported coal. The Port Qasim coal power plant is already mixing Thar lignite and will completely shift onto it once its production is scaled up.

SECMC has already commissioned a study in collaboration with the Private Power and Infrastructure Board for gradually converting China-Pakistan Economic Corridor coal plants in Hub, Jamshoro and Sahiwal to indigenous lignite. A 105km long Thar Rail project being planned to connect Islamkot with Main Line will soon be undertaken to transport lignite to the power plants in the rest of the country. That will make the substitution of imported fuels with cost-effective indigenous sources feasible and faster.

There are no two opinions that indigenous coal can turn Pakistan into an energy secure country and help make electricity affordable for industrial and economic growth, as well as lift the lifestyle of its citizens.

"Indigenous coal can be our saviour but that requires long-term thinking and policies. It is time we develop a sustainable strategy for our strategic energy security and produce affordable power to support our economic growth," contends the SECMC chief. ■

Courtesy Dawn

ENERGY NEWS

Mari Petroleum profit soars 57pc in Q3

Mari Petroleum Company Limited has reported a 57 percent rise in its quarterly net profit by March 31, 2022, showing an increase in its cost of sales.

In a statement to the Pakistan Stock Exchange, the company reported a net profit of Rs10.889 billion for the third quarter, down from Rs6.955 billion the previous year. The company skipped any dividend for this period. Earnings per share (EPS) came in at Rs81.63 per share, compared with Rs52.14 per share last year. The company said its sales for the quarter rose to Rs28.447 billion, compared with Rs18.405 billion a year earlier. For the nine months ended March

31, it announced a net profit of Rs27.459, up from Rs23.356 billion recorded during the corresponding period last year. EPS for this period remained at Rs205.84 per share against Rs175.08 per share. Analysts said earnings came in line with the market expectations.



Agreement with Chinese firm CNCEC will finance offshore LNG terminal

— EU Report —

The transition to liquefied natural gas (LNG) from diesel and oil is the correct way forward for Pakistan in terms of making the shift to renewables, remarked Daewoo Gas Chief Executive Officer Shahid Karim.

He was speaking at a ceremony held to mark the signing of a Master EPCF (engineering, procurement, construction and finance) contract between Daewoo Gas and China National Chemical Engineering Company (CNCEC). "We look forward to the continued cooperation of the government of Pakistan to help us achieve the goal of delivering LNG to Pakistan's industrial and domestic consumers at the earliest," he said.

Under the contract, CNCEC would design, construct and finance an offshore LNG terminal with topside equipment to enable LNG filling into ISO containers (intermodal containers) for use in Pakistan. The specialised LNG containers would be moved by trucks all over Pakistan, where LNG

would be re-gasified at client sites, according to a statement.

"At its peak, Daewoo Gas' terminal will handle 10,000 tons of LNG per day, improve Pakistan's energy supply, create thousands of jobs nationally and reduce carbon emissions," the statement added.

The total foreign investment in this project including the terminal, facilities, LNG logistics and supply infrastructure was estimated to be around \$300 million.

"The project is based on the innovative design of transporting LNG on trucks and bowlers loaded with ISO tanks rather than through the pipeline system. This technology is referred to as 'Virtual LNG' (VLNG) pipeline and is common in China," the statement said.

Detailing about the plan, Karim mentioned that the vision was to operationalise the terminal within a year – before summer 2023 – at Pakistan's LNG zone in the Arabian Sea. He voiced hope that the project would not only help meet the energy needs of Pakistan, but would also contribute towards upgrading the natural gas industry in the country with innovative technology. ■

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Utilization of microalgae biomass

◆ Dr Mehmood Ali ◆

Pakistan's current estimated population is 229 million and it is expected to be doubled in the next 36 years. Pakistan, having less than 1% share in world energy consumption, meets its energy demand through imported and indigenous resources, with a major portion of using petroleum based derived fuels.

According to Integrated Energy Planning for Sustainable Development (IEP) report published by Ministry of Planning, Development & Special Initiatives Government of Pakistan (2021), the statistical data showed that final energy consumption in Pakistan increased from 12 Mtoe in 1986 to 52.17 Mtoe in 2020, with a 4.4% annual compound growth rate.

Therefore, it is important to look for alternative renewable energy resources besides fossil fuel to reduce dependence on imported crude oil with an expenditure of large amount of foreign exchange. As per Pakistan Bureau of Statistics (PBS), petroleum import bill hit a record high of \$11.69 billion in the first seven months (July-January) of fiscal year 2021-22 mainly due to a surge in energy prices in the global market and partly due to a pickup in demand in the country.

Therefore, looking at the renewable energy resources to reduce dependence on imported petroleum crude oil and fossil fuels, biomass from plant source is a potential feedstock to produce liquid, gaseous and solid biofuels. Biofuels are biodegradable and environment friendly in nature and help in mitigating climate change and global warming issues with reduced emissions of greenhouse gases (GHGs).

These biofuels are a source of renewable energy and can be used directly in the existing internal combustion engines without any modifications. The major biomass sources include agricultural residues, non-edible vegetable oil seed crops and microalgae. Oil can be extracted from these feedstocks to produce biodiesel fuel for diesel engines through transesterification method, while the solid biomass residue can be utilized to produce bio-gas by anaerobic

digestion process and bio-ethanol fuel for gasoline engines is made from the microbial fermentation process.

Microalgae is a unicellular marine or aquatic microorganisms (phytoplankton), which is getting importance in the last few decades as a promising feedstock for biofuels production due to its higher biomass productivity rate than terrestrial crops.

It helps in carbon dioxide (CO₂) sequestration for its growth cycle through photosynthesis process, thus mitigating climate change/global warming issue and give us oil to produce biodiesel and other valuable products. It can be cultivated in open ponds, raceway ponds and closed photobioreactors depending on the availability of the area. Microalgae culture needs essential nutrient resources such as carbon dioxide (CO₂), nitrogen (N), phosphorus (P), potassium (K), and other nutrients for its growth production.

Therefore, microalgae can be cultivated

from domestic wastewater utilizing the nutrients present in it for its growth and simultaneously treats wastewater by removing organic and inorganic pollutants. Microalgae cultivation on marginal land helps in reclamation of uncultivated land, according to Soil Survey of Pakistan, 1.78 million hectares are considered as severely saline, that can be used to cultivate marine microalgae species.

Microalgae oil productivity rate is higher 58,700 litres/ hectare as compared to non-edible vegetable seed crop (Jatropha) 1892 litres/ hectare per year. Moreover, proceeding with ecological sustainable approaches for microalgae cultivation on marginal land and domestic wastewater to obtain biomass as a feedstock for biofuels generation reduces its production cost. Moreover, microalgae cultivation using domestic wastewater instead of fresh water and sustainable approaches to capture CO₂ from the atmosphere, thus helps in complying with UN's Sustainable Development Goals.

The microalgae biomass obtained after harvesting from wastewater is used for biofuels production, whereas the treated wastewater becomes safe for irrigational purpose of non-edible crops and tree plantation. Green liquid and gaseous fuels like biodiesel, bioethanol and biogas are produced from microalgae biomass, while the leftover microalgae solid residue after oil extraction and fermentation processes can be utilized as a solid biofuel or can be used as a natural organic fertilizer (compost) to improve soil quality with better crop yield. ■

Pakistan is going to be water scarce: Sherry

Pakistan is going to be water scarce country by 2025, therefore, water needs to be utilized economically, says Federal Minister for Climate Change, Ms Sherry Rehman while addressing a ceremony at Marina Club Karachi.

She further said that they have to tackle the greater challenges of climate change. "The younger generation need to be equipped with adaptability to environment. 90% of the Indus Delta has already been damaged through waste and garbage while the rivers are a kind of host of food, water and life. We should safeguard our rivers, deltas and seas," she further added. She motivated the people of Pakistan to experience such adventures and protect their culture, heritage and their assets. She said: "It is very painful to see the downstream of Kotri Barrage without water. The fair distribution of water need to be ensured throughout the country in order to have every province their due share."



How to manage fuel subsidies

◆ Dr Abid Qaiyum Suleri ◆

The years 2020 and 2021 will be remembered both due to the deadly pandemic and the vast fluctuations in global energy demand and its prices. In 2020, global demand for crude oil dropped the most since the Second World War. On April 20, 2020 the future oil contracts for May 2020 dropped 306 percent to settle at a negative \$37.63 a barrel.

However, the price of a basket of oil, coal, and gas had doubled in October 2021 compared to the prices in May 2021: the earlier-than-expected recovery from Covid-19 in 2021 had surged the global energy demand.

The trend continued in the year 2022 – this time because of the Russia-Ukraine war. Due to Western sanctions (and potential sanctions) on Russian fuel supplies, energy prices in March 2022 were double their level in March 2021. This was the largest price increase for natural gas and coal. The steepest rise in energy prices in nearly 50 years caused the biggest shock to commodity markets since 1973.

According to the World Bank's latest report on commodity price outlook, the price of Brent Crude oil is expected to average \$100 per barrel in the year 2022, the highest annual level since 2013. These trends have put tremendous inflationary pressure on consumers worldwide, compelling their respective governments to provide some relief.

In this context, some governments are providing subsidized fuel, others are managing energy consumption through rationing, and yet others are using a mix and match of policy measures to minimize the pain of fuel inflation.

In Pakistan, the PTI government too came up with an energy relief package. On February 28, 2022 it reduced general sales tax (GST) on petrol and petroleum development levy to zero percent, slashed the prices of petrol and diesel by Rs10 per liter, and announced to fix those prices till June 30, 2022. The claim of the then finance minister to finance the relief package through enhanced revenue collection is supported by the Federal Board of Revenue's (FBR) historic tax collection of Rs4858 billion during the first ten months of FY 2021-22. The FBR exceeded its collection target for the period by Rs239 billion. It is pertinent to mention that GST on petrol has been the single biggest source of FBR collection in the past, accounting for 35 percent of total GST collection in 2021.

Even before the relief package, former prime minister Imran Khan rejected Ogra's fortnightly recommendations to increase the

fuel prices on more than one occasion. These measures did contain fuel inflation and provided relief to the consumers. But they also led to a large current account deficit (CAD) as the import and consumption of fuel in Pakistan remained unaffected by the global price hike.

The FBR's record collection of 'rupees' does not compensate for 'dollar reserves', which are rapidly depleting due to expensive energy imports. Rising current account deficit and piling energy circular debts are two of the major reasons the IMF opposes the energy relief package. Initially, the coalition government termed the PTI government's energy relief package as landmines for its successors. However, contrary to Miftah Ismail's assurance to the IMF that this package would be rolled back, Prime Minister Shahbaz Sharif has followed his predecessor's decision and decided to continue (at least till May 16) with across-the-board subsidies on fuel through the energy relief package.

Here, one needs to keep in mind that the CAD accruing due to the relief package will turn unmanageable without the help of the IMF. Currently, petrol in Pakistan is subsidized by Rs21 per liter and diesel by Rs51 per liter. For macroeconomic stability and to contain the energy circular debt, the government would have to withdraw energy subsidies.

One can argue that a major chunk of petrol subsidies is being enjoyed by the owners of big vehicles, who consume 5-6 times more petrol per kilometer than motorcycles and rickshaws. They consume 60-65 percent of petrol in the country, and many of them may afford to pay its full price if the subsidy is withdrawn. The biggest sufferers of the no-subsidy scenario will be the owners of 15 million motorcycles (and rickshaws), who consume around 35-40 percent of petrol in the country and require government support to cope with the fuel inflation.

There is no easy answer to the question on how the government can roll back the energy relief package without hurting the lower-middle and middle-income earners. I endorse the suggestion forwarded by different quarters to cross-subsidize

the diesel owing to its secondary inflationary impact (public transport, goods transport, agricultural machinery, etc). The proposal is that instead of increasing the price of petrol by Rs21 per liter and diesel by Rs51 per liter, their respective prices should be increased by Rs30-35 per liter, thus cross-subsidizing the price of diesel.

However, an increase in petrol price would have an immediate inflationary impact, especially on motorcycles or rickshaw owners. Targeted subsidy on petrol for these consumers, selling them petrol at a subsidized rate, is practically impossible. An alternative is to provide them relief through direct cash transfers whenever the average monthly price of petrol exceeds a certain threshold (to be determined by the Ministry of Petroleum). Let me explain how this system may work.

All two and three-wheeler owners (including government officials) earning below a certain amount per month (the threshold may be determined by the Ministry of Poverty Alleviation and Social Safety in consultation with the Ministry of Petroleum) may be eligible for this direct cash transfer programme. Their vehicles are registered against their CNICs. This record is available at vehicle registration departments and with the owner in the form of a vehicle registration document. This record could be triangulated with the National Socio-economic Registry (NSER) maintained at the Benazir Income Support Program (BISP).

I proposed the above plan to the macroeconomic advisory group of the previous government. The current government may like to tweak this plan or develop other methods to provide targeted fuel subsidies. The objective is to remain engaged with the IMF to achieve macroeconomic stability without quashing

the lower-middle-income earners under this unprecedented fuel inflation. ■

The writer heads the Sustainable Development Policy Institute.





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Pakistan at frontline of CLIMATE CHANGE

—◆— Malik Amin Aslam —◆—

Pakistan remains on the frontlines of climate change. The torrid heatwave hitting major parts of the country is yet another stark reminder of the country's growing vulnerability to climate change.

Last year, the German Watch index ingloriously categorized Pakistan as one of the three countries that have continuously remained in the top 10 list of most climate impacted countries over the past decade – although to date it remains a very low contributor to the problem. This climate injustice has been termed as one of the “gravest human rights violations in history” as it impacts millions of people residing in countries like Pakistan and suffering unavoidable impacts of climate with increasing frequency and ferocity, through no fault of theirs.

What, however, remains certain is that from the melting glaciers to the stressed mangroves, the country cannot afford to slow down its continuous struggle to cope with the consequences of climate change. Also, with this backdrop it is no small achievement that Pakistan has, over the past four years, managed to carve out a niche role at the global level as a nature leader – an effort that got unprecedented global recognition as Pakistan was termed as one of the three Global Forestry Champions by the UNEP, selected as one of the four Nature Leaders by the WEF, chosen to be one of the four pioneer countries in the Energy Transition Mechanism and honoured to host the World Environment Day 2022 to launch the global UN decade on ecosystem restoration. This success did not happen by chance. It was meticulously planned and built upon four foundational pillars.

First, Pakistan's climate vision was clear, crisp and understandably articulated. It was based on the philosophy of equipping the country to adapt to the growing climate impacts while ensuring that its development pathway does not add to the global problem but instead becomes a part of the solution. This philosophy was

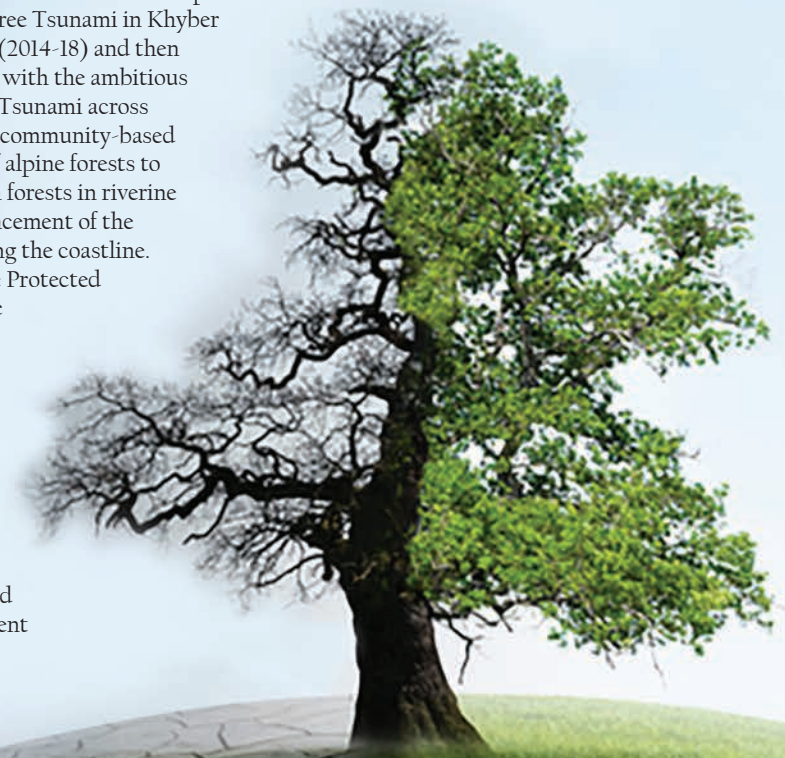
translated into a two-pronged vision based on clean energy development and nature-based solutions and both driven by quantifiable targets to ensure that these green slogans are backed by on-ground implementation which can be transparently monitored.

This model was always destined for success as long as its delivery got ensured. Subsequently, the target of shifting 60 percent energy to clean zero carbon energy by 2030 got translated into a flurry of new hydro projects replacing planned imported coal projects, the development of 10 new large dams with hydel energy got initiated, 1200 MW of wind projects stuck in red tape got started. Similarly, the country's first Electric Vehicle policy was launched to meet the target of achieving 30 percent electric transport by 2030.

Along the second pillar of nature-based solutions, Pakistan truly came out as a global trailblazer with the successful completion of the Billion Tree Tsunami in Khyber Pakhtunkhwa (2014-18) and then following it up with the ambitious 10 Billion Tree Tsunami across Pakistan, from community-based regeneration of alpine forests to new plantation forests in riverine plains to enhancement of the mangroves along the coastline. Also, under the Protected Areas Initiative the country expanded its protected areas and increased the number of national parks from 30 to 45, developed park management plans, and laid grounds for

launching the country's first National Parks Service as well as new nature protective laws in the provinces. Similarly, the Living Rivers and Recharge Pakistan initiatives are both nature-based interventions that are under design to ensure an ecological restoration of Pakistan's riverine ecosystem and revive its degraded wetlands.

Second, this action-based vision was backed by the highest level political commitment and resolve. The Prime Minister's Committee on Climate Change, chaired by the prime minister himself with all chief ministers and six relevant ministries present, was set up to take decisions and drive implementation related to climate change – all of which required complete and strong ownership as well as smooth inter-ministerial and inter-provincial coordination. This body managed to seamlessly



provide both, to ensure not only timely implementation but also successful delivery. A key success factor was that this vision for climate security steered across political divisions with the government even reaching out and partnering with the opposition province – in spirit as well as with supportive funding.

Third, ensuring transparency was a key to ensuring global credibility. While the usual layers of provincial and federal level audit mechanisms were in place, the initiatives under the climate vision were subjected to an independent third party evaluation system. In particular, in the case of the 10 Billion Tree Tsunami, a consortium of WWF, IUCN and FAO were tasked to undertake a yearly performance review and audit. This focus on transparency was critical in attaining global acknowledgment.

Finally, the initiatives under the climate vision were kept people-centric with clear linkages on how benefits would accrue to the people. Whether it was generation of green jobs through nurseries, forest protection or national park management or passing on cost savings through EV transition or home solar installations, a clear focus was to keep people's benefits at the center of all programmes.

The above pillars built up a credible green and climate-friendly edifice for Pakistan. These green credentials laid solid foundations for attracting not only global attention but also green financing through various channels. Pakistan successfully floated its first green bond of \$500 million last year, which got over subscribed 6 times by the market. The first ever blue carbon estimation study was completed, through the World Bank last year, and provides the basis for launching the country's future blue bond flotation.

Most innovatively, Pakistan was venturing into nature bonds linked to sovereign debt relaxation and also working on a scheme for nature policy based lending (estimated at \$1 billion) which, in partnership with the World Bank, remains in the final stages of development. Pakistan also became the only country to actually roll out a post-Covid 'Green Stimulus' package and secured financing to the tune of \$120 million to follow it through for protecting nature and generating green jobs. All this happened due to the momentum built upon the four pillars mentioned above.

Given the country's extreme vulnerability to climate change and its rising and inescapable impacts, the globally acknowledged pathway which is now also enshrined in our global obligations (NDC) needs to be continued as an irreversible trajectory. For Pakistan, climate compatible development is not a luxury but a necessity and this needs to transcend election cycles and sustain across the divergent political divides because

Governments will come and go but climate change is here to stay. Any reversal, or even slackness, will have not only ecological but also social and economic consequences for Pakistan. Conversely, consolidating this success can open up new vistas and opportunities by amplifying the country's global green credentials painstakingly built up over the past four years. ■

The writer is former minister of climate change, and global vice-president of UNEP. He tweets @aminattock and can be reached at: amin.attock@gmail.com

THAR COAL

Solving Energy Crisis: Future is Thar!

—◆— Syeda Qandeel Zehra —◆—

With a serious energy shortfall touching 5500MW within the country, Pakistan struggles to discover a sustainable solution for its energy production as the world struggles to tackle the fuel shortages and rising prices that have given double-digit inflation in many countries.

Meanwhile, many European countries have now considered shifting back to coal utilization as it is still considered one of the cheapest sources of energy production as the region also faces a ban on fuel and gas from the current Russian-Ukraine crisis.

Similarly, Italy has also decided to reopen its coal-fired power plants to curb the energy gap due to the interrupted Russian supply. As other European countries follow suit, Germany agreed on providing a relief package to tackle rising energy concerns and has decided to increase its use of coal.

As the global scenario, shifts to older methods to tackle short-term crises, Pakistan tends to fix itself as well, presently, a huge portion of the country's energy is generated from imported sources such as diesel, furnace oil, RLNG, etc. The problem has affected the country's debt to the extent that its current-account deficit is now out of control. As the quality and value of the country's exports do not match its increasing fuel import. On the other hand, the discovery of the 3-billion-ton coal reserve in Thar has paved the path to self-sufficiency, it can delay its renewable pledge to Europe for a few years, to jump-start its industry back to the old levels of greatness.

With estimated deposits of 180 billion tonnes of lignite coal, Pakistan has the capacity of firing 1800 power plants of 1000 MW for 30 years or 500 power plants for 100 years. These deposits have been estimated to be more than the combined oil and gas reserves of Saudi Arabia and Iran. These deposits are more than the combined oil and gas resources of Iran and Saudi Arabia.

Problem is that the world is making the shift to renewable energy and ditching coal, gas, and even oil. Unfortunately, the world has turned against coal and even gas and oil. But what can Pakistan do? sadly we do not have the budget to achieve the unrealistic targets of adopting renewable sources of energy. Also, the country's over-dependence on hydro, with Dams in Pakistan frequently vulnerable to fickle monsoon rains, with low water levels last summer causing rolling power cuts of seven hours a day or more.

Despite being the lowest in costs, the deployment cost of renewables is something Pakistan currently can't afford to wait and adhere to renewable energy sources.

Our government has installed two Thar-Coal-based power plants, with other projects currently being built, however, these may not be more than a complete output capacity of 5000MW. Currently, we have three 1100MW coal powerplants which are being powered by imported coal, hence a severe debt strain on our forex reserves.

Despite possessing one of the biggest coal deposits in the world, the sad reality is that Pakistan imports 19 million tons of coal per year, 50% of which is consumed by the power sector and whereas the remaining is consumed by cement manufacturers. With international coal and shipping costs post covid rising vertically, these sectors were saved by Afghan imports and some mining in Baluchistan. It was due to Afghanistan's isolation in the trade area, we received coal at relatively lower prices, however, it is high time that we convert this imported coal dependency to Thar-Coal Run plants. It is in the interest of our local cement manufacturers to develop local supply chains to maintain raw material costs and be competitive in cement exports. With dewatering technologies rapidly developing, Thar Coal can be introduced with ease in our cement sector, hence using local lignite will allow us to save more than a billion dollars per year in foreign exchange.

As a troubled economy, our policymakers should now contemplate strategies that do not involve a lot of foreign reserves or even higher technology. By awarding new mining licenses and promoting the use of local coal, we can achieve faster supply cycles and higher production levels of both High and Low-value products. ■

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THINKER

A roadmap for political reform

Long-term reform may help towards true democratic system

— Ahad Nazir —

The word 'politics' has a Greek origin. It means decision-making in groups. The most important aspect of practical politics is the need to build consensus on important decisions affecting the group of people involved. Political systems in Pakistan have seen many changes but the importance of consensus building remains paramount.

Major political parties in Pakistan range from centre-right and centrist ideologies to centre-left. Then there are fringe, extreme and radical parties. A landmark achievement for the political class was reaching a mature consensus on certain issues and subscribing to the so-called Charter of Democracy. The article aims to propose some basic political reforms that may result in long-term sustainable development.

The PTI government had a mixed political posture. It combined centrism with certain centre-left ideas and some centre-right tropes. Several policy decisions it took therefore have mixed long-term implications. For instance, the policy statements regarding import substitution in the first year of the government by the advisor on commerce impacted the economy adversely. So did the remarks aired by some cabinet members indicating that the government was not as keen on CPEC as its predecessor. The long-term implications of some of its initiatives like the Pakistan Single Window (PSW) and Pakistan Regulatory Modernisation Initiative (PRMI) may have a positive impact on national economy.

Another positive impact in the long run might result from the social protection schemes launched by the government. Social protection schemes initially involve net expenditure but in time can cause an increase in the overall output of the economy.

Its strong anti-corruption and accountability focus did not allow the government to build consensus even on issues that should have been bipartisan. The National Assembly had no standing committees for a long period of time in 2018. This lack of inclusivity in decision-making was one of the major factors causing frustration among its coalition allies who eventually sided against the government in the vote of no confidence against the prime minister.

This failure to create inclusive decision-making mechanisms in the government is



not new either. Kitchen cabinets were known to have existed in the previous governments as well. Political decision-making became a major factor in some of the state institutions becoming active and revolting against those governments.

Based on international best practices, here are some recommendations for long-term political stability in Pakistan: setting up political boundaries, the conceptualisation of shadow cabinets, strengthening of the roles of parliamentary standing committees, rationalising the size of the cabinet, and empowering the local governments.

Setting up the political boundaries includes accepting that some components of decision-making require consensus. This, for instance, should include economic policymaking due to the nature of the current economic conditions. This will require considering the needs and advice of all stakeholders and building a consensus on all issues. The focus must be on creating an enabling environment where all stakeholders are involved in economic decision-making.

The next step should be to consider the role of shadow cabinets. Given an enabling environment, this can be a very strong mechanism for exchange of political wisdom on economic and other issues as a shadow cabinet works on important policy tasks, such as determining the federal and provincial budgets. The impact of this method will be significantly enhanced if the incumbent government is willing to share accurate data with the opposition.

This will require the relevant member of the cabinet to engage the opposition's nominated member(s) in, for example, the budget-making process. This will, in turn, present an opportunity for the elected members to gain

firsthand experience of the decision-making process. Additionally, the role of relevant standing committees will evolve with the shadow government concept. Members who have had the experience of the shadow portfolio may be made part of the standing committees. This will result in more effective accountability of the government and more meaningful and practical arguments.

The relevant power and authority should be devolved to the local government level in letter and spirit. The issue of the development budget seems to outperform the legislative capacity of the honourable members of National and Provincial Assemblies. In order for them to focus entirely on macro-level issues, there needs to be an effective system in place for micro issues at the local government level.

This will also ensure transparency in the electoral process and accessibility of basic amenities to all citizens irrespective of their political affiliation. Similarly, transparency and accountability in the approval mechanism of development projects shall also play a major role. The use of a socio-economic scorecard mechanism to provide funds for only the most important socio-economic projects can help growth and development.

This may be followed by a rationalization of the size of the cabinet. The shadow cabinets can give requisite experience to opposition members to prepare them for cabinet positions in the future.

Long-term political reforms may eventually help Pakistan achieve sustainable development and transition towards a truly democratic system.

The writer heads the Centre for Private Sector Engagement at the Sustainable Development Policy Institute. ■

Jolywood solar tech termed key player in clean energy

Muhammad Bin Safdar

Q & A

—◆— Mustafa Tahir —◆—

Energy Update: What is your viewpoint regarding the potential of Pakistan to produce electricity based on renewable forms of energy?

Muhammad Bin Safdar: Pakistan is one of the richest countries with respect to solar irradiance and solar power potential. Our desert and coastal areas are unique and full of potential with respect to wind energy. We have one of the largest hydro power plants and we need to work more on this. In short, there is no shortage of renewable and clean energy in Pakistan. It is all about the right exploitation of our energy resources, energy strategy and utilizing our potential to its best.

EU: Tell us about the role of your company to promote the usage of renewable electricity in Pakistan after abandoning the consumption of fossil fuels for power generation?

MBS: Founded in 2008, Jolywood is a national high-tech enterprise. It was successfully listed in 2014 (stock code: 300393). The company focuses on innovative R&D and high-quality manufacturing of photovoltaic auxiliary materials, solar cell and module, system integration and other products. We are keen to develop in

Pakistan and help Pakistanis to adopt the latest clean energy technologies in the world. N-type Topcon Technology is the latest technology in solar pv modules with the highest efficiencies this field has ever seen. Most European countries have already adopted this technology and we are really looking forward to the Pakistani market to do so as we lack in the power domain and need it the most.

EU: What are the best technology offerings of your company for domestic power consumers so that they shouldn't face power failures during peak summers?

MBS: As the world's largest back sheet manufacturer with 30% market share, Jolywood was awarded financial health Top3 by Photon. Jolywood N-type bifacial solar technology is widely used. The Niwa series reach in-

dustry's highest power 460w which is the lowest LCOE solution. The company's N-type Topcon bifacial products have been applied to the green energy projects promoted by the United Nations Development Program and the world's largest N-type power station (Sihong 500MW)

We have a large window of modules depending upon the requirement and nature of the installation. We are the only company developing the surface dedicated specialized pv modules. For example: we have dedicated panels for rooftops, shed type installations and ground mounted solar power projects. This is all because of our 14 years old renewable experience and back sheet specialization.

EU: Tell us about the technological features/qualities of the solar equipment of your company that make them more advanced and reliable than the solar equipment of your competitors.

MBS: Well N type Topcon technology is the latest and the leading technical spec in the solar industry right now, having multiple technical and financial advantages. Lower degradation, lower temp-coefficient, higher efficiency and longer warranty period are few salient features which make our product stand out of others. We offer 30 years of performance warranty rather than 25. We offer 1% first year degradation in comparison with 2.5% of PERC modules. We offer 0.4% annual degradation after 1st year in comparison with 0.7% per year degradation of PERC modules. Our temp coefficient is 0.31%. There are some aggressive competitors as well but we prefer to stay on the realistic figure. We have replaced the Boron in our panels to avoid the Boron effect (hotspots) which is one of the main issues in the PERC series. You can easily save good amount in LCOE and BOS with the help of Jolywood N Type Topcon technology.

EU: What are your products for the industrial power consumers in the country to help them with their efforts to increase their reliance on clean electricity?

MBS: Pakistan is a country with power deficiency. It's a harsh fact that we all know. By switching to N Type, one can easily boost its solar yield up to 5% in terms of plant efficiency. That means 1 lakh extra unit production per MW as compared with PERC modules. Moreover, large scale deployments are ground mounted and we have specialized bifacial panels from ground mount projects to optimize your yields.

EU: What help your company could provide to different power utilities in Pakistan to undertake utility-scale solar energy projects?

MBS: Jolywood solar technology has been

a key player in world renewable and clean energy promotions and support. We have done around 600MW of PPA and over 6GW of N type deployment globally. We would love to participate in utility scale projects of Pakistan as I have witnessed myself that we are still using polycrystalline panels which are sort of outdated and no one uses them anymore. We would love to see N type deployments in utility scale so that we can use our finances and land in the most optimum manner and boost our yield in order to serve the nation with more power output. It is my appeal to energy ministry and other stake holders to make sure the use of latest equipment and pave the way for our country for a better and bright future.

EU: Do you have any plan to join hands with the provincial governments to ensure power supply to remote/rural areas using solar power?

MBS: Yes, we really look forward to such collaborations as it is beneficial for both our country and Jolywood solar technology as well. Our national and provincial governments need to make sure that we attract such projects and companies who have the back to execute such high-profile projects on neutral terms. Projects like Sindh Agri are a good initiative for rural areas to provide them with break-free supply of water through solar powered pumps. Same initiatives need to be taken for Punjab as well.

EU: What reforms do you want in Pakistan to effectively regulate the renewable electricity sector and to prevent the sale of substandard solar products in the local markets?

MBS: We need to waive off the GST as it

was earlier and make it easier for everyone to afford a solar power system. GST had a strong discouraging impact on our solar industry unfortunately. How come we promote a product or a technology with high tax tickets? We need to focus on solar rather than hydro. Strategic hydro power plants like DIAMIR BASHA and KALA BAGH are equally important but the biggest advantage of solar plant is its availability and ROI. You install it today and start using tomorrow as compared to long building tenures of hydro power which take up to 10-15 years. We suffer devaluation, recalculation, unnecessary halts etc. So, it's my opinion that we stop wasting time and start increasing our generation capacity with utmost dedication and robust implementations.

EU: What policy initiatives Pakistani govt should launch to meet the target of producing 30 per cent of its electricity based on renewable forms of energy by 2030.

MBS: We need to get rid of fossil fuels and Znd fuel engines, replace our conventional vehicles with EVs, provide tax evasions for all energy related projects and equipment. Facilitate people in acquiring such latest technologies, support industries to take part in their power shift and optimize their industrial cycles. Provide friendly ground aspects for international firms to come and work here. Subsidize solar and wind projects. Friendly loans shall be a part of the plan for clean energy. We together need to move towards a green, clean and carbon-free Pakistan. The government must make sure to achieve the target of producing more than 30% of the power through renewable sources. God bless Pakistan. Pakistan Zindabad!

Gauss Auto to establish an EV plant in Karachi



The 'Gauss Auto Group,' a Chinese corporation, has announced plans to build an electric vehicle (EV) plant in Pakistan's special economic zone near Port Qasim in Karachi. The company would enter into a joint venture (JV) with AKD Group Holdings (Pvt) limited, and export their locally produced EVs from Pakistan to other countries. The plant would span roughly 1,000 acres. The company made this announcement during a meeting with Federal Minister Board of Investment (BOI) Chaudhry Salik Hussain and BOI Secretary Fareena Mazhar.

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Towards petroleum pricing and subsidies

—♦— Syed Akhtar Ali —♦—

Petroleum prices have been maintained at the status quo, but as it appears that it may not be possible to maintain the prices at the present level for long. How much price increase is possible or feasible is an open question. In this space, we will explore some solutions and strategies.

In only recent times, the issue used to be how much to tax the petroleum products. Now the issue is, not to talk of taxation, how much to subsidize. International oil prices have gone so high that petroleum taxation has become impossible.

In Pakistan, the problem is the most severe due to the heavy Rupee devaluation.

Maximum taxation rates have been pegged at Rs 30/liter as Petroleum Levy (PL) and 17% GST. Assuming 100 Rs/Liter landed cost, there would have been around Rs 50 per Liter taxation. PL would vary with landed cost; if it were high, lower PL would be charged and if PL being low, higher PL rate up to a maximum of Rs 30 per Liter would be charged.

Presently, Gasoline price is charged at Rs 149.98 /L, while it costs Rs.166.95/L, resulting in a subsidy of 29.60 Rs/L. Subsidy on Diesel, similarly, comes out at 73.04 Rs/L, while retail price is 144.07 Rs/L and cost is 208.60 Rs/L.

Current total subsidies on Gasoline and HSD (excluding on Kerosene and LDO, which insignificant) come out to be Rs.73 billion per month or Rs.876 billion per year, if international prices are assumed to remain the same. There is an additional loss of revenue of Rs 900 billion per year in terms of PL and GST.

GoP faces a dilemma; petroleum prices have already undergone a big rise in a year in the midst of a general

inflation wherein food prices have also suffered due to food prices inflation in international market as well. There are both budgetary deficits and current account deficit.

A compromise solution may have to be done under simultaneous Demand Management and Rationalisation of subsidies. Subsidy is removed altogether from gasoline so as to increase the gasoline price to Rs 166.95-180/L. However, there will have to be two-tier pricing. Gasoline price may have to be frozen at the current level of Rs 149.98/L for low income group identified as motorcycle users. In effect, this would mean introduction of cross subsidies for the poor, which is widely prevalent in energy sector such as electricity and gas and practiced well.

Subsidy for diesel may have to be halved, reducing it to Rs 36 billion per month. This would increase diesel price to Rs 180/L. Some volume reduction should also help, bringing down the annual total subsidy to less than 400 billion per year. The question is if the resulting price increase would be socially and politically feasible?

We have been arguing in this space for the introduction of a separate brand of Gasoline for Motorcycle users in the form of low RoN gasoline. Carburetor vehicles, older cars and motorcycles, can run on low RoN gasoline, while the newer brands owned by higher

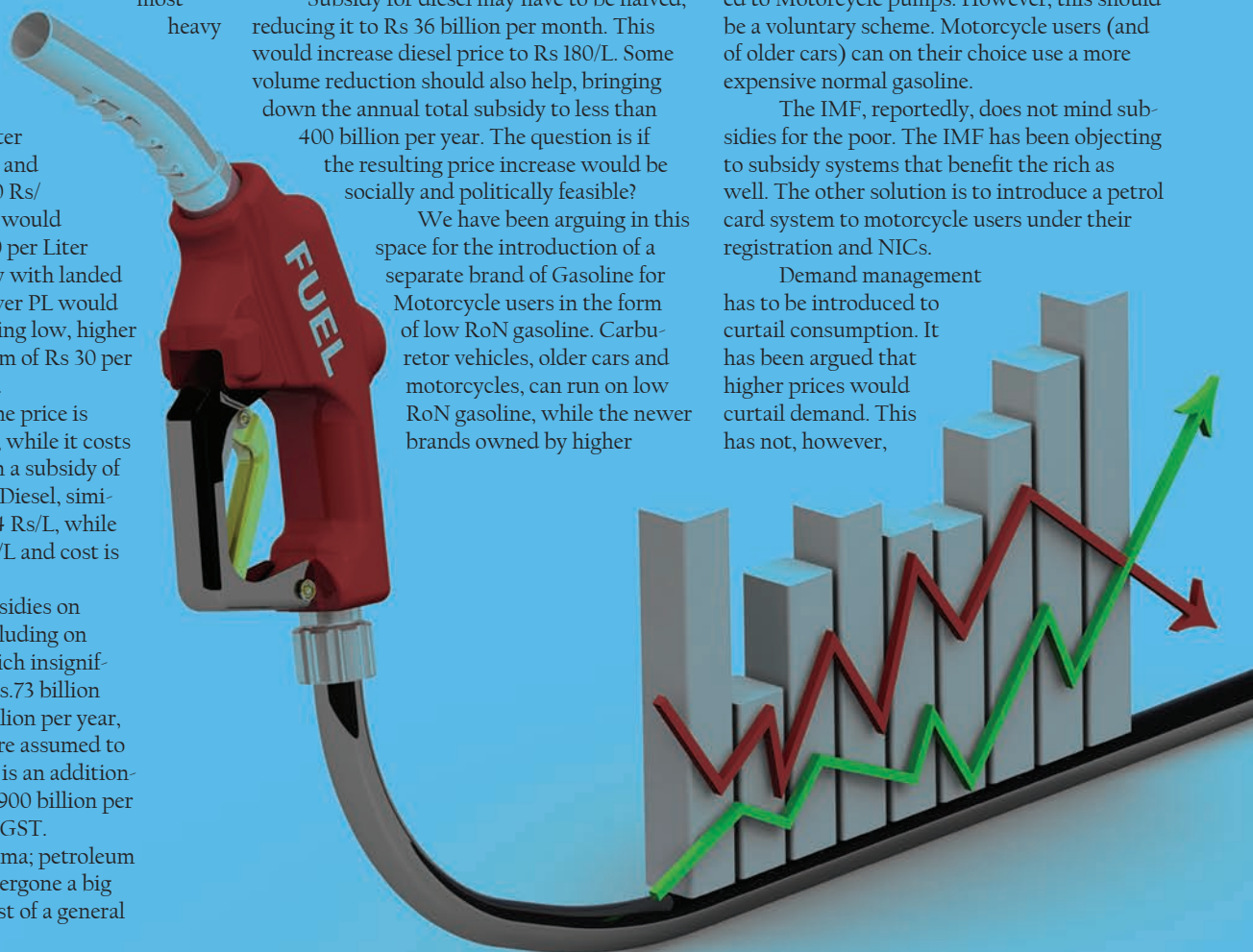
income groups cannot run well on low RoN, thus a protection against misuse of subsidy by higher income group using newer cars having electronic fuel injection system.

Some circles from the petroleum industry have opposed it to be impractical on account of logistics that management of yet another fuel brand is not feasible or would be difficult. Their second argument is that, there wouldn't be much price advantage. Let us take the first argument of logistics first.

There is a very large group of motorcycle users of 4 million which can justify separate arrangements and logistics. Separate and specialized petrol pumps can be established. There is no need of new pumps. Some of the existing ones (one-third or so) can be converted to Motorcycle pumps. However, this should be a voluntary scheme. Motorcycle users (and of older cars) can on their choice use a more expensive normal gasoline.

The IMF, reportedly, does not mind subsidies for the poor. The IMF has been objecting to subsidy systems that benefit the rich as well. The other solution is to introduce a petrol card system to motorcycle users under their registration and NICs.

Demand management has to be introduced to curtail consumption. It has been argued that higher prices would curtail demand. This has not, however,



happened appreciably. In the recent period, petroleum demand has been on the rise despite heavy price increase. There are two or three reasons; firstly, there are some sectors and segments which are not influenced by price at all; secondly, the poor group is already at a mere subsistence consumption level and; thirdly, economic and population growth causes some increase as well.

Rationing is one of the effective tools of demand management. In older times, there used to be Ration Shops for food items such as flour and sugar which worked rather well in non-compute times. Rationing is not liked. But it would have to be resorted to forcibly by the circumstances which may be anarchic. A well-planned rationing system may be prepared at least for implementation when needed. Public sector and large private companies may be advised to introduce fuel control programmes having some targets. 10-20% saving may be possible in this respect.

This problem and the proposal should not be dubbed away as a temporary one. Poverty and non-affordability of the energy items would remain an enduring problem, as we have seen in the case of gas and electricity.

There are other mid-term solutions such as introduction of Bio-CNG which is a cheaper fuel, especially, for public transport system; cleaner and cheaper. In Sindh province, there is a scheme, which is running at a slow space. A fast-track Bio-CNG scheme may be introduced in all provinces. It may be noted that petroleum prices in Pakistan are lower than in other developing countries which prompts the IMF to pressurize the government to increase petroleum prices.

GoP would, however, itself be ultimately constrained to increase the petroleum prices under financial constraints. Even Sri Lanka has higher prices than in Pakistan. In India, petroleum price are about 80% higher. In Bangladesh, 29% higher gasoline prices, although the differences in HSD prices are lesser, a constant feature in Bangladesh policy of lower HSD prices. In Vietnam, the Philippines and Thailand, petroleum prices are similarly higher by 60-70%. However, the specific circumstance of Pakistan of recent high currency devaluation should be considered in this respect arguing for a mid-way compromise approach which may have to be worked out diligently.

Let us hope that Russia-Ukraine war ends sooner and the energy and other commodity markets come back to normal. Even common people in rich countries are feeling difficulty in paying their energy bills. Poor and developing countries would not be able to sustain so expensive energy for long. IMF and other IFIs will have to think over some form of a voluntary commodity price stabilisation fund for developing countries, in collaboration with oil producers, if the phenomenon lasts for longer. ■

The writer is former Member Energy Planning and author of several books on the energy sector

A chaotic economy

—◆ Farhat Ali ◆—

While the incumbent finance minister Miftah Ismail was still in the air on his way back, having announced the successful conclusion of an understanding with the International Monetary Fund (IMF) on loan revival, Prime Minister Shehbaz Sharif had rejected an Oil and Gas Regulatory Authority's (Ogra's) summary for passing an increase in prices of petroleum products on to consumers. A little earlier, the IMF said that the government had "agreed that a prompt action is needed to reverse the unfunded subsidies which have slowed discussions for the 7th review."

The finance minister is reported to be now preparing a plan to phase out the subsidies for POL products with least political consequences. Till such time, the IMF programme remains suspended as withdrawal of fuel subsidy is one of the prior actions for programme revival.

Simultaneously, the government was expecting to obtain a \$7.4 billion financial assistance package from Saudi Arabia in the shape of cash deposits and oil on deferred payments, including rollover of the existing \$4.2 billion facilities that are expiring by the end of this year. Saudi Arabia only agreed to roll over, for an additional one year, the agreement earlier made with the PTI government on \$3 billion cash at 4% interest rate and supply of \$1.2 billion oil on deferred payments at 3.8% rate.

The State Bank of Pakistan's (SBP's) policy rate continues at 12.25 percent and the discount rate is at 12.75. An additional 100 basis points increase in the policy rate in the upcoming review in May is expected. Kibor is over 14 percent.

The consequences of the said figures is an economic slowdown at a time when the government is running out of sources to fund the fiscal deficit which is at record level. The situation becomes more critical in the absence of an agreement with the IMF and limitation of expected funding from friendly countries and international lenders.

Whereas, the other critical issue is the rising trend of inflation which in this fiscal year (FY22) is likely to be around 11-12 percent while the number can cross the 15 percent mark in the next few months.

The current situation, which is char-

acterized by political instability, confusion and reluctance in taking the bold and timely economic decisions, is severely affecting the local and foreign investor's confidence - which in turn affects the revenue generation capacity of the government. Foreign investors are concerned at growing pending tax refunds which as of March 2022, amount to over Rs77 billion, including Rs43 billion income tax refunds.

A demand to this effect was made by Overseas Investors Chamber of Commerce and Industry (OICCI) on behalf of 51 foreign firms, whose tax refunds were yet to be released, in a letter written to the Federal Board of Revenue (FBR).

According to it, "We firmly believe that tax refunds should be an ongoing process so as to avoid liquidity issues of our members that continue to pay huge tax on their ongoing business activities."

Ironically, while tax refunds of ones who are generating maximum revenue for the government and adhere to ethical business and tax paying practices is held up, mega scams of issuing fraudulent tax refunds continues.

In a recent case the Federal Tax Ombudsman (FTO) has directed the Federal Board of Revenue (FBR) to form a high-powered inquiry committee to fix responsibility on tax officials involved in a mega-scam of issuing bogus tax refunds amounting to Rs 123.364 million for Tax Year 2007 to 2009 and 2011.

Prime Minister Shehbaz Sharif has constituted a 21-member Economic Advisory Council (EAC) to review and formulate economic policies in a holistic manner. The past government also constituted similar advisory councils comprising almost the same experts. What came out of it is little known. Problems are on the table. The time is now to act and act alone within a small time window.

The incumbent government, which is hamstrung by diversified coalition partners and mounting pressure by the opposition for elections, will not be able to meet the formidable task of taking the economy out of the woods. Political stability is a must. The incumbent government cannot do much on its own to stabilise the worsening situation. All stakeholders of the nation must put their act together to salvage the sinking economy. ■

The writer is a former President, Overseas Investors Chamber of Commerce and Industry

What will the new energy policy be?

—◆— Haneea Isaad —◆—

A PML-N led coalition government recently came into power following the infamous ouster of former prime minister Imran Khan. The new government was instantly riddled with a long list of system inefficiencies; unsustainable subsidized petroleum prices, a looming balance of payments crisis, intense heatwaves, and a massive shortfall in the country's ability to meet its power demand. All factors are interconnected.

Tightening fuel supplies amidst Russia's invasion of Ukraine and sky-high prices for oil, coal, and LNG have led to emerging economies like Pakistan being priced out of competition for these commodities, and exposed Pakistan's weak position on energy security. Pakistan has faced repeated defaults even on term LNG cargoes, while procurement on the spot market leads to an unprecedented economic burden, as Asian spot prices remain upwards of \$25/mmbtu.

Imported coal and furnace oil are also elusive choices, as South African coal reached a high of \$457/mt in March, and Brent Crude fluctuated around \$100/barrel.

Unable to secure fuel supplies, almost 3.5 gigawatts (GW) of installed capacity has been forced to shut down, with 1.2GW of RLNG based capacity facing closure since December 13, 2021. The government's inability to service debt and clear almost \$1.62 billion worth of dues towards the China-Pakistan Economic Corridor (CPEC) Independent Power Producers has hurt their ability to secure fuel supplies, resulting in three 1320 megawatts (MW) imported coal power plants taking half of their capacity offline.

Ironically, climate change continues to show the region how this increased dependence on fossil fuels harms the planet, as South Asia continues to be battered by scorching temperatures. As citizens scramble to keep their households cool under the unrelenting heat, the country's peak demand has surged up to 25GW against a generation of only 18GW. The 7GW gap left by this shortfall is managed by country-wide load

shedding of almost 4-12 hours a day. The government's solution to this has been to import more expensive furnace oil and liquefied natural gas (LNG), contributing further to the balance of payments crisis. A full circle is thus achieved.

Artificially subsidized petroleum prices, combined with pressure by the International Monetary Fund to reverse these subsidies, and legacy issues of circular debt in the power and gas sector, add to the unenviable list of problems this government must face. Understandably, it is floundering to find a solution to all at once.

The key to resolving many of these issues lies in a balanced and diverse energy policy. The PML-N's proclivity toward fossil fuels such as coal and LNG is well known. In fact, during the incumbent government's previous regime (2013-2018), LNG was introduced to Pakistani markets and various LNG infrastructure including regasification terminals and power plants, was established. The CPEC, which the PML-N considers its biggest achievement to date, was also the catalyst for Pakistan's coal development.

Even now, the inclination seems to be towards fossil fuel-based fixes, particularly imported LNG, but this doesn't come cheaply and is still unreliable. To make up for four-in-a-row defaults by Gunvor, Pakistan LNG Limited (PLL) recently secured six LNG cargoes ranging between \$24 and \$32/mmbtu on the spot market. In contrast, term cargoes through Gunvor would have cost \$12.5/mmbtu on average. The government also seems keen to sign more Government to Government (G2G) and long-term contracts. Shahid Khaqan Abbasi, chairman of the Prime Minister's National Task Force on Energy, indicated in a recent address that "the Prime Minister during his visit to Saudi Arabia would seek an LNG deal." If this doesn't go through, Pakistan could always turn to its other friendly Middle Eastern neighbour, Qatar. While Qatar may have

awarded Pakistan favourable long-term contracts in the past, it may not do so anymore.

According to Bloomberg, a rush of import deals triggered by a worsening supply crunch has led to top suppliers offering 10-year contracts, starting in 2023, at rates about 75 percent higher than similar deals signed last year. This could easily mean term prices of around 16-18 percent of Brent crude, falling in the range of \$18-20/mmbtu at current crude oil prices. G2G deals also take time to materialize. The recent deal with Qatar took two years of negotiations to come about, so come this winter, Pakistan will very likely still be going through a vicious cycle of non-supply and power outages.

Meanwhile, economically feasible and cleaner sources of power generation such as wind and solar energy face regressive taxation and regulatory barriers, which discourage investment in these technologies. Energy efficiency and investments in the grid take the back burner, as more immediate challenges take precedent.

While a focus on dispatchable sources of generation may be justified in the near term, it is clear that a fossil-fuel based economy is neither economically nor environmentally sustainable in the longer term. The government must immediately reverse taxes on renewable energy and carry out auctions to ensure that held up renewable energy development goes ahead as planned. CPEC, which the prime minister spoke of prioritizing in his inaugural speech, will be a great way to ensure that capital flows in the right direction and investments are diverted from fossil fuels toward renewables.

The remainder of the year will be crucial to see how the government deals with the energy hydra it currently faces. Will it repeat the mistakes of its predecessors or continue to make the ones it set in motion itself during previous regimes? Or will it finally heed the warnings issued by environmental conditions and global commodity markets, and eventually divest from costly and polluting power generation? ■

The writer is an energy finance analyst at the Institute for Energy Economics and Financial Analysis (IEEFA). She can be reached at: hisaad@ieefa.org



New solar boxes could expand clean energy to poor region

◆ Derrya Ozdemir ◆

Imagine being able to power your house with solar "energy cubes" that you can stack up like LEGO pieces to create a network of energy. It sounds like something out of sci-fi movie, yet this remarkable idea invented by a Swiss company may one day actually provide us with inexpensive clean energy across all grids.

From a distance, Switzerland-based Power-Blox's PBX-200 looks like a cooler box you'd commonly see on a beach; however, that couldn't be further away from truth. These "solar boxes" have batteries powered by portable solar panels, and just one of them can supply the majority of a home's energy demands.

This is a system that adapts to your needs since the solar boxes can expand, divide, and re-group. To create energy for a community, the batteries in the blocks can

merge to form an energy swarm, as the boxes can easily be plugged into another box.

Engineering behind Power-Blox

Power-Blox technology is unique in that it combines the ease of use of a solar home system with the power of a mini-grid. The system was created by electrical engineers who were inspired by nature, specifically, a school of fish.

The PBX-200 series, like fish, may grow, split, and re-group, with the batteries combining to form an off-grid "energy swarm" with limitless application possibilities.

The PBX-200 system is made up of "intelligent" energy cubes with built-in batteries, which are available as both lead or lithium ion, and each cube generates 200 watts of alternating current. They can be powered by a solar unit or any other external source like wind, hydrothermal, biomass, or a generator to supply the electricity needs of a household or



small commercial business. To put that into perspective, Tesla Powerwall, which is an integrated battery system that stores solar energy for backup protection, can provide up to 5 kW of continuous power with a storage capacity of 13.5 kWh.

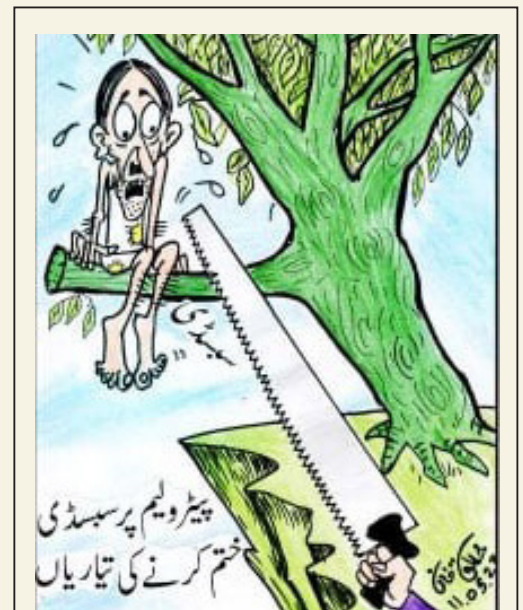
However, it should be noted that Powerwall is fundamentally different from the Power-Blox in that Powerwalls do not contain swarm technology and must be installed by professionals. One of the finest aspects of the PBX-200 system is that it does not require configuration, specialized knowledge, or maintenance. When the need for electricity increases, the PBX-200s are plugged in without interrupting the power supply within a few minutes.

Revolutionising energy across world

Since the PBX-200 is a more adaptable and flexible system than mini-grids, it has enormous potential in some of the world's poorest and most remote areas. Since 2018, the firm has supplied over 2,000 power blocks in approximately 20 countries, providing the energy storage solution to dozens of communities in collaboration with the United Nations

Development Programme (UNDP) and other humanitarian organizations.

In one recently electrified Mozambique village, people have used the invention to start selling items from cold drinks to fridges and offer customers mobile charging stations. There is a growing interest from Western countries, too. Power-Blox has powered 150 Swiss mountain cabins and helped Swiss IT businesses transition from analogue to digital communications. The biggest obstacle seems to be a lack of funding; however, the researchers are already looking for ways to make the solar boxes even more sustainable, as the current lithium-iron phosphate batteries could easily be swapped out for a better model. ■





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Thar coal can overcome energy crisis: expert

Says Thar coal project expansion can save \$420m per annum

A total of 175 billion tonnes of coal deposits in Thar can easily make the country self-sufficient in energy without depending too much on imported fuel, said energy economist Ammar Habib.

He said the current global energy crisis had disturbed the pricing equilibrium for various fuels wherein energy planners and the government had failed to proactively manage the same. According to him, the enhanced volatility in energy prices further strengthens the case for increased reliance on indigenous fuels to avoid an energy and balance of payments crisis. "Energy security is essentially national security," he added.

Habib said Pakistan was in dire need to exploit indigenous resources for energy production and efforts needed to be accelerated to extract indigenous coal from Thar to generate cheap energy as base load. It may be noted that the imported costly resources have contributed heavily to the country's ever-expanding current account deficit, and with the volatility in oil prices and chances of further devaluation of the rupee against dollar, this situation is all set to worsen not just in the coming weeks, but for months and years, till the time a shift towards indigenous resources doesn't happen.

He said Pakistan should double down on investing in renewable energy and hydel resources as well particularly in utility-scale renewable, while incentives should be given to further promote off-grid renewable solutions.

Habib was of the view that the government should learn from the past mistakes and explore the viability of extracting more coal from Thar to run the coal fired power plants

which will become operational in the next few years. There needs to be an effort on war-footing to convert existing imported plants to Thar coal, either through usage of blended coal, or other methods - it is estimated that this will save more than \$2 billion in imports for the country, while also ensure energy security. Thar coal could help Pakistan significantly improve its energy mix with import substitution, he asserted. According to him, the present and future governments should focus on connecting Thar to the rest of Pakistan through the Thar Rail Link project, which is the need of the hour and on which considerable work has already been done. Once approved and deployed it will be a step in the right direction for the long term energy security of the country.

It is worth adding here that the Phase-III expansion of Thar Coal Block II Mine to 12.2 million tons per annum has been approved. It is expected to be completed by June 2023, which in turn will reduce its coal price to \$27 per ton to make it the cheapest fuel source for the country, thus, leading to economic stability and energy security.

In the long term, the Thar coal project expansion and its outcome will enable Pakistan to save \$420 million per annum on account of foreign exchange, while it will result in the reduction of Rs74 billion in circular debt on an annual basis. Therefore, the development of Thar Coal projects is a viable solution to arrest the increasing trade deficit and reduce the country's reliance on imported fuels. ■

Cnergyico signs MoU with Abhi

Cnergyico Pk Limited (formerly Byco Petroleum), one of Pakistan's largest petroleum companies, has announced the signing of a memorandum of understanding (MoU) with the financial wellness platform, Abhi, that provides salary advance service. Cnergyico plans to use Abhi's innovative financial technology to facilitate its employees located all across Pakistan. With Abhi, employees can access their earned salary, at any time of the month. Speaking on the occasion, Azfar Saeed Baig, Cnergyico's Vice President for Information said, "Taking care of employees has been the number one priority at Cnergyico. The company has been blessed with hundreds of hardworking and dedicated individuals who are all part of the Cnergyico family." "We not only offer attractive wages, invest in training and development, cultivate a diverse and inclusive work environment, and ensure the health and safety of our employees but also provide attractive benefits by using innovative, technology-driven products like Abhi," he added.



Energy Transition

Challenges and Future Developments

—◆— Sohail Ahmed Butt —◆—

There is a long history and sequence of events leading to the energy transition (ET) from fossil fuels to renewable and clean energy currently underway. Emphasis in this article is restricted to major challenges and expected future developments. Due to climate change targets of net zero emissions by 2050 set by series of summits on climate change (Last being COP26 at Glasgow) as well as ongoing COVID 19 pandemic and now Russia- Ukraine conflict, we are now seeing a historic ET unfold across the entire energy system with added risks. The transition seems to be gathering pace despite roadblocks but is mainly being driven by geopolitics. Energy sector entities, government bodies, industries and societies they serve are approaching the topic of ET with increasing interest through legislation, policy and regulation. We also see this topic being extensively written about and discussed, debated and evolved globally through workshops, seminars and conferences as well as academic research. Main reason of this increased focus stems from the fact that ET entails substantial disruption along the energy sector supply chain. It has direct impact on amount and direction of future capital investment as well as need to address policy and regulatory changes and revision of corporate strategies and business models in a logical and coordinated manner in different jurisdictions based on their respective climate change goals and ambitions. As energy companies innovate and seek to reinvent themselves, they must still deliver value. In order to thrive today for meeting the future challenges they need to have the economic foundations in place to deliver the energy systems of tomorrow. Therefore revisiting strategies and investment policies and setting new direction in order to create business models that deliver to fast-changing customer needs is the challenge as well as an opportunity. To do this with speed and efficiency, energy systems and the platforms that control them need to rotate at pace to data-driven, cloud-based digital technologies. These technologies will facilitate the optimization required, but implementing them also demands a review of risk management and governance capabilities to protect the business from unexpected roadblocks and bumps during the transition period that could last longer than expected. In 2021, the IEA released its landmark global roadmap, Net Zero by 2050, which detailed two parallel transformations for the power sector as it decarbonizes. The first is that variable renewables will increasingly be the foundation of low carbon power generation. The second is that power will be responsible for an increasing share of total energy demand, as electrification becomes a pathway to decarbonization. Emerging economies are central to global emissions reduction, since they typically have high shares of fossil fuel generation and because electricity demand is expected to significantly increase along with economic growth and greater electricity access.

Increasing shares of variable renewable energy such as solar and wind will mean that power systems need to become more flexible. Thermal power plants – will play a smaller role as decarbonization objectives require their reduced use. Such generation plants as well as heavy energy consumption industries will also have to adopt innovative technologies such as carbon capture and storage (CCS or UCCS) in order to reduce their carbon emissions.

Variable renewable generators primarily depend on the availability of the sun and wind, and thus requires complementary technologies to ensure that the balance between supply and demand is maintained at all times. New technologies – in particular batteries and other energy storage, biomass, and thermal plants either with CCS or burning clean fuels – will therefore play an increasing role to supply this flexibility between demand and supply during ET.

A new global economy is emerging as a result of energy transition (ET), technology and innovation is leading while new political realignments are changing into a new world order. Many industrial and commercial sectors face a challenge of revisions and adaptations of their existing business models. Hence new disruptive elements at both macro and micro levels will be faced. Geo Politics is increasingly impacting ET as we see the supply constraints of fossil fuels being created through avoidable conflicts between superpowers leading to volatility and high oil and gas prices.

As we go through a period of super powers confrontation, sanctions, forced trading patterns leading to uncertainties and economic slowdown (dampening demand cycles) in a changing world order that disallows diplomacy and neutrality, the following key developments can be noted as we pursue our journey to a cleaner sustainable and affordable energy future.

With decarbonization as a key objective, the prospect that oil demand will peak in the not-too distant future has become a topic of debate in energy circles. So called “peak demand” would have significant geopolitical and geoeconomic consequences for oil-producing and importing nations alike.

Many of the oil and gas exporting countries do not have diversified economies and are highly dependent on oil revenues for the majority of their budgets. Revenue declines can have a destabilizing effect, particularly on countries that have fragile political institutions.

Technological leadership in clean energy creates a group of countries that “win” in the energy transition, while other, poorer countries still rely on oil-based technologies. Similarly the producers of rare earth materials that will be imperative for future technologies including battery storage and renewable energy efficient hardware will greatly benefit.

Global energy mix will bring more diversity, but also less security as the supply and demand for energy will remain an important factor influencing the global balance of power in the future. ■

Qatar's 'Dr Cool' keeps World Cup stadiums chilly with solar-powered AC



Qatar has become almost a byword for scorching heat, but some fans will still take a sweater to World Cup stadiums because of state-of-the-art air conditioning that its mastermind says will become the norm for mega sports events.

Saud Abdulaziz Abdul Ghani, nicknamed 'Dr Cool', worked for 13 years on the solar-powered cooling system that he says will keep the players and turf healthy and even eliminate body odour in a packed stadium. Stadium cooling is nothing new. The Superdome, home of the New Orleans Saints American football team, has 9,000 tonnes of air conditioning equipment.

At the 40,000-capacity Al Janoub Stadium, which will hold seven games including holders France's first match, Saud said a two-metre-high "completely isolated bubble" of cool air will envelop the pitch and stands. Inside the bubble, players and fans will be kept at 21 Celsius (70 Fahrenheit) by jets blasting air at the pitchside and under spectators' seats.

Giant solar farm

The power for the system comes from a giant solar farm in the desert outside the capital Doha, he added. The same technology is being used in greenhouses where Qatar grows increasing amounts of its own food. "We have the best thermal insulation on our machines, the best sensory systems around the stadium," said Saud.

And the air conditioning will still be needed in December, despite the cooler temperatures.

Each human generates the heat of

two laptops and gives off 70 grams (2.5 ounces) of sweat per hour, according to Saud. He gave the example of the Lusail Stadium where 80,000 people will gather for the World Cup final on December 18.

"They are there for four hours, so that is a lot of water. And I also have the heat of 160,000 laptops in that space. So that heat must be offset irrespective of whether it is winter, summer, autumn or spring." The use of air conditioning in stadiums remains controversial, however.

Russell Seymour, chief executive of the British Association for Sustainable Sport, said that while the technology and renewable energy in Qatar may work he had concerns about the wider message given by air conditioning an open space.

At a time when people are being urged to save energy "quite often people in an office will open the windows, they want fresh air but they've also got air conditioning on and then things compete, and that's when the issues come".

Saud said he is happy for any expert to inspect the system and check his sustainability claims. The technology has been made free of patent restrictions for anyone to copy.

He is also certain that future World Cups -- particularly in 2026 in the United States, Mexico and Canada -- will follow suit. "In the future, for the safety of players, air-conditioned stadiums will be more of the norm," he said.

As global temperatures rise due to climate change, "if you want players to complete the game without water breaks, without any interruptions then air conditioning will be a necessity". ■

Climate change: A biggest risk to water sector

Over 70pc Pakistanis do not have access to safe drinking water: Report

—◆ Dure Sameen Akhund —◆

Climate change continues to be one of the most important global issues confronting the international community. For Pakistan, it is a reality we can no longer ignore. Climate change is currently the biggest un-

mitigated external risk to the water sector. Pakistan is already categorised as one of the most water-stressed countries in the world, where supply is hovering around 1017 cubic meters per capita.

Climate change is not expected to greatly alter average water availability over the coming decades, but inflows will become more variable, increasing the severity of floods and droughts. Climate warming is expected to drive water demands up to 15 per cent by 2047, in addition to the demand increases from population and economic growth.

Water security is further undermined by poor water resource management and poor water service delivery. Pa-

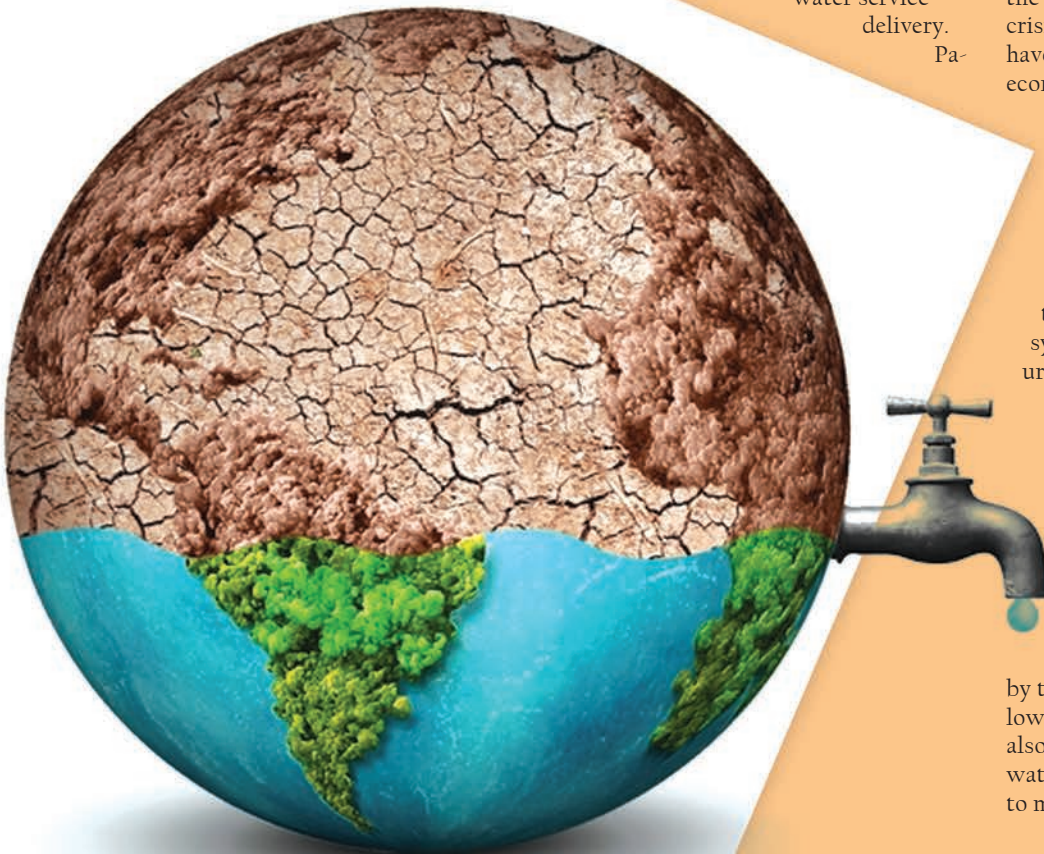
kistan has a storage capacity of 30 days, whereas more than 70pc Pakistanis do not have access to safe drinking water. More than 53,000 children in Pakistan die annually from diarrhoea due to poor water quality.

By current projections, the per capita availability of water will decline to a mere 800 m³ by 2025. In this critical situation, improved water governance, management and conservation will not only play a critical role in Pakistan's economic development, food security, energy needs and health requirements, but will also lead to environmental sustainability.

A report issued by World Bank warns Pakistan against the business as usual (BAU) water management approach. How the country deals with this impending water crisis, and the speed at which it does, will have a significant impact on the country's economic development and standard of living for its people.

For a country looming toward an acute water crisis by 2025, there seems to be a complete lack of interest or initiatives from the government. From major infrastructure projects in the form of desalination plants and wastewater management systems to supplying water to all the urban areas of Pakistan and finally better water management in agriculture, there is a sense of urgency in each of these projects.

Providing a safe and reliable water supply to the ever-growing urban population remains a huge challenge. The scarcity of water supply in Karachi is not just a combination of increased demand due to massive urban migration followed by the natural dwindling of water in the lower Indus delta, but rather this scarcity is also the result of inequitable distribution of water. Where instead of working together to manage resources more efficiently, dif-



ferent actors try and compete for power over these vital human needs.

Thus, as a result, where some parts of Karachi are inundated with a water supply at minimal cost, other areas are paying a premium just to get access to this basic need. This results in massive inequality in both the supply of water and the cost at which its supplied to citizens living in different parts of the city.

Officially Pakistan has the lowest water tariffs as compared to the whole of Asia. Water and sanitation agencies responsible for 44pc of water and sanitation activities are only able to recover between 40pc to 60pc of their operation and management costs as best. Water governance in Pakistan needs to reevaluate its National Water Policy and pay special attention to water storage and management.

Although agriculture activities use up to 95pc of Pakistan's available water, it is largely untaxed, where the government recovers only a quarter of annual operating and maintenance costs. Moreover, water is inefficiently utilised in the agriculture sector using the anarchic flood irrigation system, which not only puts a heavy burden on water resources, it also strips away soil fertility making Pakistan's yield per acre one of the lowest in the world.

The government needs to reevaluate agriculture policies using hybrid seeds, growing produce that does not require too much water, investing in drip irrigation and solar power operated agricultural machinery.

Pakistani authorities need to step up their efforts and focus on water storage and management along with an independent and transparent assessment of water inflow and outflow in every province. More so there needs to be a reorganisation of the incentive structure when it comes to water.

The public-private partnership model has been successful in a host of infrastructure projects in the country and the same perhaps needs to be done for water. The Green Banking Guidelines issued by the State Bank of Pakistan provide incentives for investment in green structures which does include water management as an area of focus.

On the private sector side, industry leaders have taken a key interest in actively reducing their water consumption. Nestle Pakistan, Soorty Enterprises and a few other organisations have taken a leading role and gotten certified by the Alliance for Water Stewardship Standards 1.0, the first global framework that promotes sustainable use of freshwater.

This allows companies to make an action plan with targeted approaches to improve, incentivise and recognise responsible water use, including stakeholder engagement within their supply chain. All these actions will help corporations become more objective-driven, rising to the challenge and taking charge of fixing this impending water crisis. ■

Courtesy Dawn

NTDC's 80pc grid stations lack fault recording system



—◆ Munawar Hasan ◆—

National Transmission & Despatch Company's (NTDC) nearly 80 percent power grid stations lack proper event and fault recording mechanism, which resulted in frequent breakdowns amid long spells of announced and unannounced load-shedding in the country.

"Owing to such criminal negligence, power transmission utilities did not have the ability to record, locate, promptly repair and fix responsibility for power breakdowns," official sources said.

An alleged major willful negligence has been unearthed in NTDC, wherein 16 power grid stations out of 20 were not equipped with any Event and Fault Recorder (EFR) system. Owing to this, NTDC lacked the ability to record, locate, promptly repair and fix responsibility for power breakdown.

One of major beneficiaries of such severe deficiency in power grids are said to be independent power producers (IPPs) as with no evidence of power failures originating from these power plants, imposition of penalties and remedial measures cannot be initiated on their management, sources said.

According to the report titled 'Commissioning and Time Synchronisation of Faulty/Non-commissioned EFRs at NTDC Grid Stations, North Circle, an eight-member working group was constituted for commissioning and time synchronisation of faulty/noncommissioned EFRs at various NTDC grid stations.

In its findings, the working groups

observed that only four grid stations were equipped with functional and updated EFRs.

According to the working group's report, in many grids stations EFRs are not installed on all bays, therefore it is strongly recommended that all the bays be equipped with them for complete monitoring of the system.

It has been observed that at the time of energisation of the grid stations, the commissioning of EFRs is usually overlooked, and the equipment eventually serves its useful life un-commissioned, hence defeating the purpose of its procurement and installation.

Therefore, it is recommended that in the future, the EFRs should be commissioned prior to the energisation of the grid station with dedicated GPS.

It was noted that there are grid stations where event & fault recorders are non-operational after commissioning due to problems in the hardware/software communication/licence corruption, beside there are a number of grid stations where NTDC management has failed to install updated versions of obsolete EFRs.

The working group recommended that the obsolete EFRs at six identified grid stations be replaced with the latest technology numerical/digital EFRs with dedicated GPS Clock in I+1 configuration having all the communication interfaces i.e., optical, serial, BNC, ethernet etc.

One of the main reasons for these power suspensions is non-existence of proper monitoring mechanism. Moreover, NTDC seldom puts the blame for such failures on IPPs (Independent Power Producers), said sources. ■



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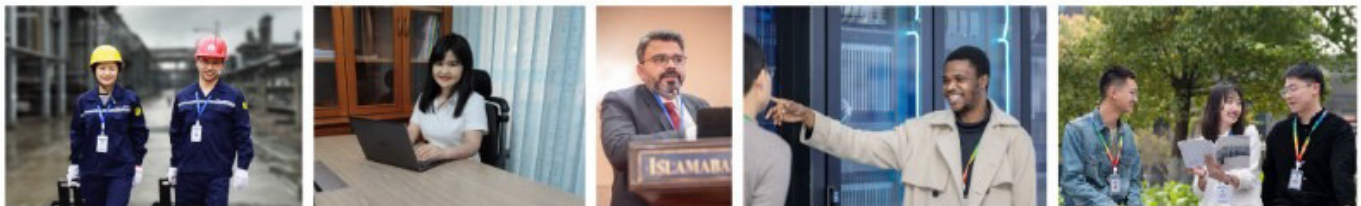
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Solis unveils off-grid PV inverter

—◆ Halima Khan —◆

The S5-EOIP(4-5) K-48 series off-grid PV inverter has an efficiency of 96.7% and supports parallel operation of up to 10 units, which allows for a system capacity of up to 50 kW.

According to the manufacturer, the device is compatible with all top-tier brands of lithium-ion and lead-acid batteries.

In one of the highlights of this week's Smarter E in Munich, Chinese PV inverter manufacturer Solis has taken the wraps off its new off-grid inverter. Designed for areas without power grids or areas with frequent power outages, the S5-EOIP(4-5)K-48 series boasts a peak efficiency of 96.7% and features an AC charger and a built-in MPPT solar charge controller.

"S5-EOIP(4-5)K-48 was first launched in some markets with no power grid or unstable power grid, such as Myanmar, Pakistan, South Africa, and Spain," the company informed. "However, the product will be released and made available for any market where there is significant demand."

The system supports the parallel operation of up to 10 units to expand capacity up to 50 kW. Depending on the system configuration, the PV inverter comes with a rated output power of 4 kW or 5 kW, and a surge capacity of 8 kVA or 10 kVA.

Based on the application, the system is also configurable in terms of AC and solar input. It has a maximum PV input voltage of up to 500 V, maximum solar charge current of 100 A, and maximum AC charge current of up to 80 A.

With one MPPT channel and maximum two string inputs, the MPPT voltage ranges from 90 V to 480 V.

The device, which also features IP21 enclosures, measures 335 x 450 x 160 mm and weighs in at 14 kg. Its operating ambient temperature



The new PV inverter from Solis is designed for areas without power grids or areas with frequent power outages.

ranges from -10 to 60 degrees Celsius.

According to Solis, the inverter can work with or without batteries and is compatible with all top-tier brands of lithium-ion and lead-acid batteries. Also, S5-EOIP(4-5)K-48 is compatible both with the grid or generators as a backup power source.

The manufacturer provides a standard two-year warranty for its off-grid PV inverter series, as well as online technical support and services of local technical teams in key countries and regions around the world.

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Pakistan makes modest progress on SDGs

—◆— Khaleeq Kiani —◆—

Pakistan's first Sustainable Development Goals (SDGs) Status Report (2021) is out and the country's overall progress on SDGs is modest.

"Overall, Pakistan's SDGs (composite) index score has increased from 53.11 in 2015 to 63.49 in 2020 i.e. 19.5 per cent up from the baseline of 2015," according to Dr Shabnam Sarfraz, member of Social Sector and Devolution of the Ministry of Planning, Development and Special Initiatives.

In summary, the status report finds a considerable decline in extreme poverty, improvement in access to energy, increased industrial activities, reduction in maternal mortality, improvement in undernourishment, food insecurity, wash and housing, and climate action.

There are many areas identified by the report that need urgent collective attention such as education, children out of school, the proportion of youth not in education, employment and training, provision of decent work environment, implementation of climatic adaptation etc.

There are many areas identified that need urgent attention such as education, employment and training, provision of a decent work environment and implementation of climatic adaptation

Since 2015, the Government of Pakistan has not published a consolidated report that presents the country's progress on SDGs indicators viz-a-viz their baseline values. The report captures the existing data availability gap and compares the baseline 2014-2015 with values of the most recent available data on 133 SDG indicators.

The report says that Pakistan's progress on SDG-1 — poverty reduction has been steady. Poverty has been on the decline between the period 2014-15 and 2018-19 with 9.3 million people lifted out of poverty away from the national poverty line. Similarly, Pakistan witnessed a significant decline in the proportion of the population affected by disasters.

In a drive towards zero hunger as espoused by SDG-2, undernourishment



declined by 4.2pc from 20.2pc to 16pc from 2015 to 2019. Also, a moderate achievement was made through the reduction of stunting by 7pc and wasting by 4pc during 2013-18 among children under five years of age.

Improvements are seen in health outcomes for mothers by reducing anaemia among pregnant women by 16.5pc in seven years during 2011-18. There was a one per cent decrease in the agricultural area under productive and sustainable agriculture, from 39pc to 38pc, over four years during 2015-2019.

On good health and well-being under SDG-3, Pakistan has shown reasonable progress by improving most of the basic health indicators. The number of mothers dying during pregnancy and live births reduced by 32.6pc during 2007-2019. Births attended by skilled health personnel increased by 10pc in five years during 2013-18. National vaccination coverage improved by 11.5pc in five years between 2013 and 2018.

Concerning education achievements (SDG-4), the country's progress has been dismal. The primary completion rate has stagnated at 67pc in five years during 2015-20. Similarly, the gender gap (SDG-5) of 9pc between the primary completion rate of males and females has also persisted in this period. The lower secondary completion rate has marginally increased from 50pc to 59pc during 2015-20. The national literacy rate stagnated at 60pc in five years during 2015-

20, which is alarming and worrying.

More girls were enrolled in schools improving the gender parity in net enrolment at primary, middle and Matric levels during 2015-19. Large deficiencies and disparities persist in the provision of basic services to schools across the country.

Access to clean water and sanitation has also shown improvements at the national and provincial levels over time under SDG-6. Improved source of drinking water is available to 94pc of the country's population. Access to drinking water in Balochistan has increased by 17pc in 5 years during 2015-20. The population having access to unshared toilets and handwashing facilities is 68pc and 54pc respectively, as per Pakistan Social and Living Standards Measurement Survey (PSLM) 2019-20.

On SDG-7, Pakistan's commitment to the environment is shown by an increase in the share of renewable energy by more than four times between 2015 to 2019. The reliance on clean fuel (cooking) increased to 47pc in the period during 2018-19, from 41.3pc in 2014-15 at the national level. An increase of 3pc was recorded in 2019-20 with 96pc of the population having access to electricity as compared to 93pc in 2014-15.

On SDG-8 ensuring decent work and economic growth, the economy experienced a slowdown with an annual growth rate of real GDP per capita declining to -3.36pc in the fiscal year 2019-20 from 2.04pc in 2014-15. Sim-

ilarly, almost one-third of the total youth (30pc) in the age group (15-24 years) was not obtaining education, employment or training at the national level over the four year period of 2015-19 (SDGs indicator 8.6.1). Within the country, the highest instance of this category of youth was in Khyber Pakhtunkhwa, 38pc. The children aged 10-14 years engaged in work slightly reduced by over 2pc to 6.47pc from 8.64pc during 2015-19, at the national level.

Some progress was made on the SDG-9: industry, innovation and infrastructure targets. With the availability of new data from PSLM the baseline value is established with 88pc of the rural population living within two kilometres of an all-season road. The proportion of small-scale industries in total industry value added increased to 10.50pc in 2019-20 from 8.40pc in 2014-15, despite the overall negative effects of Covid-19 in 2019-20. The proportion of the mobile phone-owning population increased by 1pc in two years, from 45pc to 46pc between 2018-20.

A slight dent was made by the reduction of income inequality by 2pc in 2016-2019 for SDG-10. A small decline of 7pc in the proportion of the urban population living in slums, informal settlements or inadequate housing also occurred during 2014-2018 from 45pc to 38pc for SDG-11. Pakistan remains committed to addressing the problem of hazardous waste and to compliance with the Basel Convention as required under SDG-12 concerning sustainable consumption and production. Regarding SDG-13 on climate action, greenhouse gas emissions were 375.03 million tonnes in 2016, a 2.5pc increase from 2015.

Relating to the SDG-14: Life below Water, Pakistan has maintained the proportion of fish stocks at 30pc within biologically sustainable levels for the five years between 2015-20. Despite the growing population and rapid urbanisation pressures, Pakistan's forest area as a proportion of total land remained unchanged at around 5pc in five years between 2015-2020 which is one of the targets of SDG-15: Life on Land.

On SDG-16: Peace, Justice and Strong Institutions; in terms of counting the uncounted, birth registration of children under 5 years showed an improvement by 8.2pc in five years between 2013-18. Under SDG-17 developing partnerships for achieving SDGs showed significant improvement in its journey towards digital transformation as the fixed internet broadband subscriptions per 100 inhabitants increased by 20pc in three years during 2017-20. ■

Courtesy Dawn

Pakistan's climate crisis

Climate change budget cut by 34pc in 2020-21

—◆ Eric Shahzar ◆—

Every year, we are seeing new undeniable climate events, clear evidence that accelerated climate change is here. Droughts are intensifying, oceans are acidifying and with the fast melting of the glaciers, we are now witnessing millions of climate refugees in the making.

Pakistan, one of the most vulnerable countries to climate change, has not even done the bare minimum to make the climate change narrative mainstream, with economic and political instability in the country mainly hogging the spotlight.

Even after the historical 18th Amendment, which paved the way for provincial autonomy, the role of federal ministries is most important for introducing progressive legislation, and creating a well-structured umbrella for even provincial ministerial portfolios. In the last three and a half years, with the PTI in power, the federal climate change ministry experienced new lows. From being a cash strapped ministry to introducing initiatives for political point scoring, the real climate action narrative was nowhere to be seen. While the

PTI government banked on the billion-tree tsunami project, we must understand that Pakistan cannot simply plant its way out of the climate crisis without constructive structural changes. Now with a new federal government, one must be hopeful for some effective changes. There are four areas which need to be urgently addressed. First, the federal climate change ministry itself needs a major overhaul. In 2017, the PML-N government had introduced the much-needed Climate Change Act that vowed to formulate three vital sub-institutions: the Climate Change Council, the Climate Change Authority, and the Climate Change Fund, but none has been activated.

Second, the ministry must lay out its budget allocations with transparency and not politicize projects. While countries around the globe are quadrupling their climate change budgets in a bid to mitigate the climate crisis, Pakistan, under the PTI government, slashed the federal climate change budget by a shocking 34 percent in the 2020-21 federal budget. What was even more alarming was that 98 percent of the total budget was only dedicated to the federal government's 10 billion tree tsunami project, which was itself marred by corruption, according to Supreme Court proceedings.

When questioned by Senator Sherry Rehman in the Senate debate in 2020, former state minister for climate change minister Zartaj Gul had no clue and resorted to blame-games.

Third, the federal government must make medium-long term strategies to phase out coal by the end of this decade. Renewable energy is not only good for the environment but also will help generate revenue in our fragile economy. At the same time, Pakistan must also build infrastructure for a smooth transition to electric vehicles (EV). Fourth, the ministry must create an inter-provincial unit for a robust climate response across the country. Without national unity, Pakistan simply cannot mitigate ecological disruption.

The PTI government had normalised polarizing debates. Now, as Pakistan moves towards healing, constructive climate action debates must take place with all stakeholders, including members of the civil society, present on the same table. Solving accelerated climate change is not a question of politics. This is now a matter of human survival. ■

The writer is a lecturer and a doctoral candidate





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New govt but old economic crisis

Currency volatility, rising deficit, fiscal woes still hover

—◆ Aadil Nakhoda —◆

The economy is trapped in a vicious cycle as the balance of payments crisis emerges after every few years.

Even though the government has changed, the economic challenges remain the same. The volatility in the currency exchange rate, the rising current account deficit and the challenges on the fiscal front at a time when political temperatures rise exacerbate the economic challenges.

The current account deficit, as reported by the State Bank of Pakistan (SBP), for the first eight months of FY22 surpassed \$12 billion. The current account was in surplus in the first eight months in the previous fiscal year.

While receipts of exports of goods and services and remittances increased by approximately \$8 billion, the payments on imports of goods and services increased by around \$20 billion in the same time period.

The foreign currency reserves at the SBP decreased to \$11.3 billion on April 1, 2022 from \$16.2 billion on March 4, 2022. However, with the new government in place, the foreign reserves situation is expected to improve once the country receives the next loan tranche from the IMF.

Furthermore, the recent hike of 250 basis points in the policy rate can help boost dollar inflows and further stabilise the foreign exchange reserves held at the central bank. According to statistics provided by the Pakistan Bureau of Statistics (PBS), exports of commodities increased by 26% in the first eight months of FY22 over the same time period of last fiscal year, while imports increased by 55.1%.

The textile group, which contributes approximately 60% of total exports from Pakistan, observed a year-on-year growth of 26.1%. Exports of knitwear increased by 33.9%, or approximately \$830 million, and exports of readymade garments increased by 25.1%, or \$500 million.

Considering imports of commodities, imports of petroleum group almost doubled year-on-year in the first eight months of FY22, to \$12.9 billion. Although the quantity of petroleum products increased by 22% and quantity of petroleum crude increased by only 1%, the dollar value for the former rose by 116.7% and for the latter by 79.9%. Furthermore, the dollar value of LNG imports increased by 105%. One-third of the increase in total imports year-on-year is contributed by the increase in imports of items in the petroleum group.

Another major item is the import of medicinal products, which spiked approximately 400%, or \$3 billion. The total year-on-year change in value terms for the rest of the commodities is less than \$4 billion. Hence, the imposition of import restrictions is unlikely to reduce the current account deficit as a majority of the goods imported are likely essential.

Although the value of imports of petroleum products is likely to be dictated by world prices, the lack of productivity and inefficiencies in converting input into output are contributing factors to the large imbalance between exports and imports.

According to the World Bank's World Development Indicators, Pakistan's exports as a percentage of gross domestic product (GDP) were approximately 10% in 2020, one of the lowest in the world. This is particularly disconcerting given that Pakistan faces regular balance of payments crisis and requires dollar inflows from exports to increase the foreign exchange reserves.

Imports, as a percentage of GDP at 17.5% in 2020, were relatively low. The weighted average tariff rate on all products, at 8.7%, is not only higher than the South Asian average but is more than three times the average reported by the East Asian and Pacific countries.

The manufacturing powerhouses in East Asia and the developed world are replacing tariff measures with technical non-tariff measures that focus on ensuring that their imports meet certain standards. This strategy not only discourages imports of substandard goods but is also important in enhancing consumer welfare.

One of the biggest challenges for the government policymakers that want to revive economic activity is the shrinking size of the manufacturing sector relative to the country's GDP. Although several experts may suggest that economy activity is shifting towards the services and construction sectors, it is unlikely that the shift is contributing to productivity gains.

The new government must push for better integration of Pakistan's economy into the global and regional markets. It should first and foremost improve trading relationships with India. Imports of textile raw material and intermediate goods from India can further boost domestic production and exports. Also, imports of cheaper agricultural products can help suppress inflationary pressures.

The government must negotiate free trade agreements with Asean member countries and Turkey, while pushing for more trade with Central Asian economies. Last but not the least, improvements in trading relationships with the US and Europe are a must to further boost export growth. A more proactive trade strategy is a must to tackle the crisis in the long run.

The writer is the Assistant Professor of Economics and Research Fellow at CBER, Institute of Business Administration, Karachi. ■



Our planet drowning in plastic

— Jamil Ahmad —

Our planet is drowning in plastic. The convenient, cheap and durable nature of plastic has led to its massive production and consumption over the last 70 years. With 9.2 billion tons of plastic having been produced in that period, plastic pollution is harming environmental and human health at each stage of its life cycle.

Excessive use of plastic impacts economies as well. This is evident in the agricultural sector where plastic is reducing soil fertility and crop production, leading to food insecurity. A recent report, released in March 2022 by the Food and Agriculture Organisation, found that agricultural land is contaminated with large quantities of plastic pollution, with 12.5 million tons of plastic products used in agriculture value chains each year, mainly in the crop production and livestock sectors.

Another 37.7m tons is used in food packaging. The report notes that Asia is the largest user of plastics in agricultural production, accounting for almost half the global usage, and warns that “in the absence of viable alternatives, demand for plastic in agriculture is only set to increase”. Proper and timely waste management is, therefore, an obvious requirement for such large production and use of plastic products while environmentally friendly solutions are being found.

In 2018, an estimated 291m tons of waste was generated, but only a small

Plastic pollution harming environmental and human health: plastic is reducing soil fertility and crop production

portion — about 20 per cent — was properly disposed of or recycled. Most plastic waste ends up in landfills or, in poor countries, in open-air dumps, causing large-scale pollution both on land and in the oceans, risking human health and choking wildlife.

Trade in plastic waste has serious implications for poor nations.

Single-use plastic products, including water bottles, shopping bags and packaging material are most hazardous for the environment as these can take up to 400 years to decompose. Pakistan, like several other countries, has banned plastic shopping bags, but the ban will have to be enforced strictly to be meaningful. Other equally harmful single-use plastic products continue to be used in abundance. The Covid-19 pandemic increased demand for single-use plastic globally through personal protection equipment for healthcare workers and other medical accessories, thus, exacerbating pollution.

National and local actions are proving insufficient and less effective due to the scale and transboundary nature of plastic pollution, which has become a global environmental concern.

The UN Environment Programme estimates that around 19-23m tons of plastic leaks into rivers, lakes and oceans annually, and that by 2040, “there will be more plastic in the oceans than fish” if the trend continues. Ominously, once the discarded plastic decomposes into microplastic, it further contaminates marine life and enters the food chain.

International trade in plastic waste is another dimension of the problem with serious implications for poor nations. Huge quantities of plastic waste generated in developed countries end up in developing countries where capacities for waste management are limited. Pakistan also imports plastic waste for use in industry and recycling. It spent \$11 million on importing plastic waste in 2018. While the bulk of the discarded plastic is traded legally, a hefty chunk is smuggled into South Asia and Africa illustrating the scale of plastic waste.

This could be a mechanism to address the triple planetary crisis of climate change, biodiversity loss and pollution and waste. However, a lot of spadework is needed. Countries will have to prepare enabling conditions through policy alignments, promoting research for environmentally friendly alternatives of plastic, and mobilising private finance for investment in a circular economy. During the preparatory process of the treaty in the next two years, it will be crucial for governments, industry, businesses and other stakeholders to rise to the challenge, look past plastic’s short-term convenience and focus more on the objective of a balanced and healthy ecosystem. For the sake of present and future generations, this is not a big ask. Environmental multilateralism has its task cut out for it. ■

The writer is director of intergovernmental affairs, United Nations Environment Programme.





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Trina Solar's global module shipments top 100GW

Marking 100GW of shipments is beginning of new energy era: Jifan

Trina Solar, the global leading provider of photovoltaic (PV) module and smart energy solutions, has reached a remarkable milestone, having shipped 100GW of modules in the 25 years since the company was founded in 1997.

With an environmental impact equivalent to planting 7.2 billion trees, collectively, the 100GW of PV modules can generate about 135 billion kWh of clean-energy power, reduc-

ing annual global CO₂ emissions by 135 million tons, and standard coal consumption by 54.54 million tons.

"We are very proud to achieve this significant feat at Trina Solar. Marking the 100GW of shipments is the beginning of a new energy era where solar PV is the main driving force. As we mark a quarter of a century, Trina Solar renews its commitment to lead the solar industry in facilitating the conversion to a carbon-free new world," said Gao Jifan, Chairman, Trina Solar.

Global clean energy development is now running at full tilt, and the International Renewable Energy Agency forecasts that global PV installations will exceed 14,000GW by 2050 as new energy, including solar energy,

becomes a major source of energy and electricity consumption. Trina Solar's high value 210 technology modules are mature in full cycle, and the ultra-high-power modules have been deployed worldwide.

Antonio Jimenez, Vice President and Managing Director, Trina Solar Middle East & Africa Region, commented: "We are extremely happy with this significant achievement which comes at a time when we also celebrate our 25th anniversary. With Dubai as the regional hub for clean energy and energy innovation, we will continue to use open technology innovation to enlarge the scope for growth and achieve sustainable development, leading the industry towards the vision of a green and carbon-free economy."



Karot hydropower connects unit 1 to grid

— EU Report —

Karot hydropower project's unit one has started to run with a capacity of 180 megawatts (MW) on full load and is supplying energy to the national grid.

The energy produced from unit 1 would support the national grid in alleviating energy crises, CEO of Karot Power Company Limited Wang Minsheng said. He added that timely commissioning of Karot hydropower projects would ease power shortage across the country.

He termed the start of unit 1 an important milestone for the project, informing that the unit two had also started wet commissioning with the support of National Transmission & Despatch Company (NTDC). Minsheng also appreciated Chinese and Pakistani staff who worked to achieve the milestone.

Karot Hydropower Project is the first large-scale hydropower project under China Pakistan Economic Corridor (CPEC). The project has a total installed capacity of 720MW and can provide about 3.2 billion kWh of clean energy annually after completion. It is located on the Jhelum River in Pakistan's eastern province of Punjab. It is expected to meet the electricity demand of about 5 million people in Pakistan, easing power supply pressure in the country. The project aims to start the commercial operation by mid-2022.

Growatt signs 120MW package deal with NMC



— EU Report —

Growatt, global renowned smart energy solutions provider, signed a 120MW package deal with National Machinery Corporation (NMC) from Pakistan, signifying the company's another significant strategic move in the country.

This 120MW deal will help provide the most reliable and advanced string inverters for local users in Pakistan, which will undoubtedly strengthen the company's leading position in Pakistan's renewable energy industry.

Growatt will supply the three-phase residential inverter MOD 3-15KTL3-X from its latest innovation, the Generation X series. The inverter features sleek and compact design as well as smart, safe and reliable functionalities. Lightweight and easy to install, it also integrates string monitoring function for fast troubleshooting, and Type II SPD on both DC and AC sides to enhance system safety.

Growatt's hybrid inverter SPH 4000-10000TL3 BH-UP with UPS function is also introduced to ensure continuous power supply for Pakistan customers. This hybrid inverter series supports parallel connection of up to 10 units, which is a good fit for small-scale commercial and industrial solar energy storage applications. In addition, the company offers ultra-safe storage battery system for a complete set of solar storage solutions, and provides whole-system services to improve customer experience.

Apart from those, the powerful C&I solution — MAX 100-125KTL3-X inverter is also added to the package deal. With maximum DC input current reaching 32A for each MPPT and 16A for each string, the MAX inverter combines well with high power and bi-facial modules. Its 10 MPP trackers support the connection of a maximum of 20 strings, which significantly reduces energy loss caused by shadow effect and module mismatch.



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SITE association installs 50KW solar system

Taking a good step towards green energy, SITE Association of Industry has installed a 50KW solar system on the rooftop of its office. The purpose of this solar system is to provide a better and healthy atmosphere as well as to cut down the energy bill of the association. SITE Association President Abdul Rasheed said it is an on-grid solar system that will cut down the energy bill of the association to a great extent after award of Net Metering License. He said since sunlight is available in Karachi in abundance, the industrialists of the area can save billions of rupees annually by using solar energy in place of conventional energy. Mr Rasheed informed that for the purpose of installation of the solar system, quotations were invited from renowned solar companies. An Energy Consultant was appointed with mutual consent and under the technical guidance of the consultant, the project was completed on a priority basis. "Apart from cuts in the energy bill of the association, some income is also expected after award of Net Metering License," he concluded.



World faces biggest energy shock since 1970s

Energy prices have surged since the Russian invasion of Ukraine and, along with other commodities, are likely to remain at historically high levels through 2024, endangering economic growth, the World Bank warned Tuesday. "This amounts to the largest commodity shock we've experienced since the 1970s," said Indermit Gill, the World Bank's vice president for equitable growth, finance and institutions. The shock — which is expected to push energy prices up 50 percent this year — is being aggravated by trade restrictions and rising prices for food, fuel and fertilizers. "These developments have started to raise the specter of stagflation," Gill warned in a statement on the World Bank's Commodity Markets Outlook report. Echoing the call from other officials at the World Bank and International Monetary Fund in recent days, he urged governments to take every opportunity to increase economic growth at home and avoid actions that will bring harm to the global economy. The report said the increases in energy prices in the past two years have been the largest since the 1973 oil crisis when the OPEC group of oil-producing countries declared an embargo. Amid the war and Western sanctions on Moscow, the price of Brent crude is expected to average \$100 a barrel this year, the highest since 2013, the report said.

KE awards \$84m EPC contract to Siemens

K-Electric has awarded an Engineering, Procurement and Construction (EPC) contract for the construction of 500/220 kV Grid at KANUPP-K-Electric Interconnection (KKI) to Siemens (Pakistan) Engineering Company Limited.

In its notice to the Pakistan Stock Exchange (PSX), the Karachi-based electric supply company informed that the estimated value of the EPC contract is around Rs15.68 billion.

The construction of the grid station would allow the company to meet the increasing electricity demand of industrial, commercial, and residential sectors across Karachi, the notice added. "Completion of this project will enable KE to import additional power of up to 800MW from the national grid from summer 2024," KE said in its notice.

Last month, KE managed to secure \$100 million in financing from Dutch Development Bank FMO to enhance its transmission and distribution network across spanning 6500 km operational territory.

The utility said then it intends to use the funds to extend its infrastructure to previously unserved areas within its operational territory, bringing more residents into its growing customer base of 3.2 million.

Another milestone

NUST amongst top 200 world universities

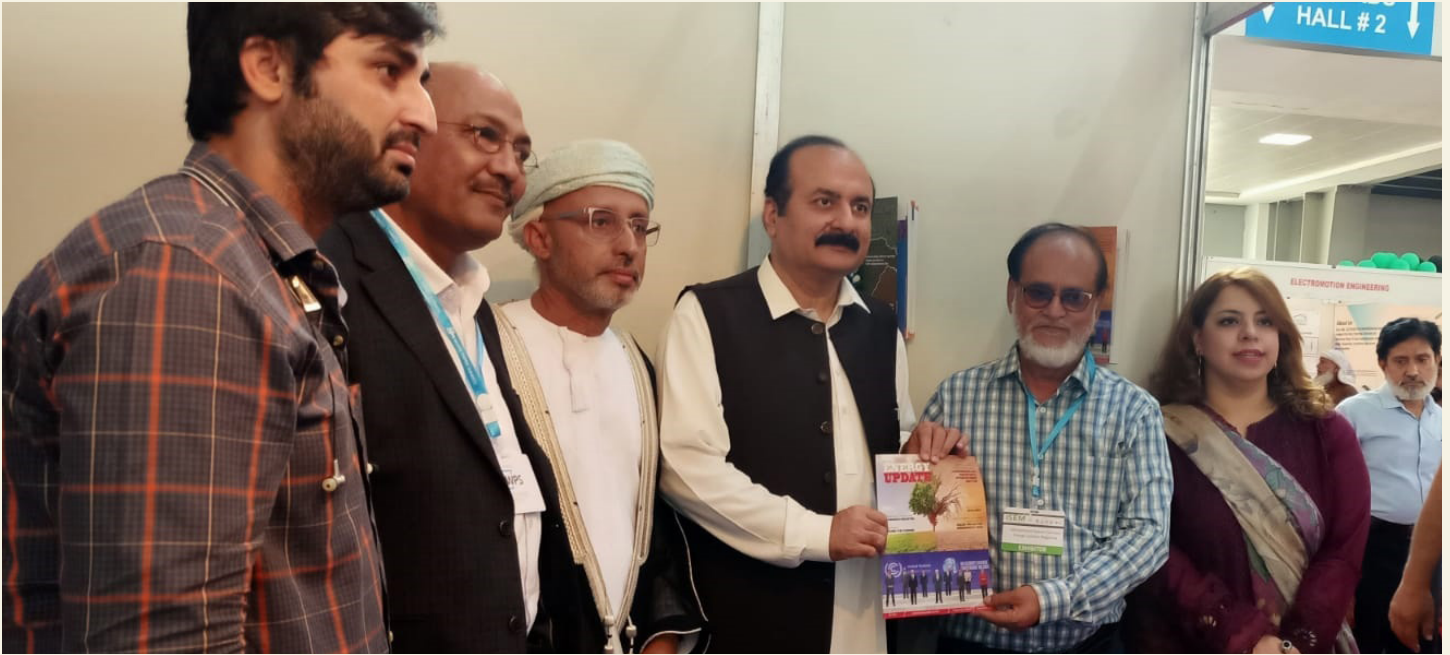
EU Report

Guided by its vision aligned with the Sustainable Development Goals (SDGs), the National University of Sciences and Technology (NUST) has clinched yet another milestone by standing amongst the top 200 world universities as per Times Higher Education (THE) Impact Rankings 2022.

According to details, the university has not only retained its overall number 1 position amongst Pakistani universities but also stood first in the country in 8 SDGs. These include Clean Water & Sanitation (SDG-6), Affordable & Clean Energy (SDG-7), Industry, Innovation & Infrastructure (SDG-9), Sustainable Cities & Communities (SDG-11), Responsible Consumption & Production (12), Life below Water (SDG-14), Life on Land (SDG-15), and Partnership for the Goals (SDG-17). It merits special mention that in SDG-7, NUST has ascended 63 positions to be proudly ranked Number 4 in the world.



In the following year, NUST took a giant leap forward by surfacing among all 17 SDGs in Impact Rankings 2020, featuring among the world's top 100, top 200 and top 300 universities in different SDG categories, while moving up the overall ranking ladder from being amongst 300+ world universities in 2019 to 200+ in 2020.



ISEM 2022 Lahore

— EU Report —

ISEM Conference was Organized by White Paper Summits on 21 May, 2022 at the Auditorium of Expo Center Lahore. The conference featured an expansive line-up of stellar speakers, case studies, panel discussions, unique presentations providing access to a wealth of industry leading knowledge, sharing best practices and experiences, spotlighting trends, information exchange, insights and outlooks with actionable takeaways. Pakistan's Premium B2B Solar Exhibition, ISEM – International Solar Energy Meet was organized at Hall Expo Center Lahore from 19-21 May, 2022.

The ISEM Exhibition witnessed large number of visitors including Commercial, Industrial and Residential users. Visitors praised the efforts of the organizers and showed keen interest in the solar energy products on display by the Exhibitors.

Energy Update was media partner of ISEM.



Renewable energy is the answer to our power crisis: Dastgir



Minister for Power Khurram Dastgir Khan said that the government remains committed to solving the energy problems of the country, adding that renewable energy like hydel and solar is the way forward.

Addressing at 2nd Int'l Pakistan Energy Summit (PRES) 2022 in Islamabad, the minister said hydel generation is the "mainstay" of the country's energy and that despite its issues it remains the most feasible source of energy in the long run.

"Interestingly the new magic bullet is solar, as we are told that solar rates are coming down. Therefore, the way forward is hydel plus solar, and whatever wind generation we can come up with," said Dastgir.

Power minister questioned the privatization of the power utility. "Is it something profoundly wrong in converting a publicly owned monopoly to a privately owned monopoly? As it appears to me that KE is not serving its consumers to their satisfaction."

Meanwhile, Minister of State Dr. Musadik Malik in his address pointed out that dependence on imported fuel has rendered local industries uncompetitive in the international market.

"50% of our gasoline oil is imported, and more than a third of our gas is now imported. So, the question arises, how can we continue, if we don't have a competitive industrial footprint in the first place?" asked Malik.

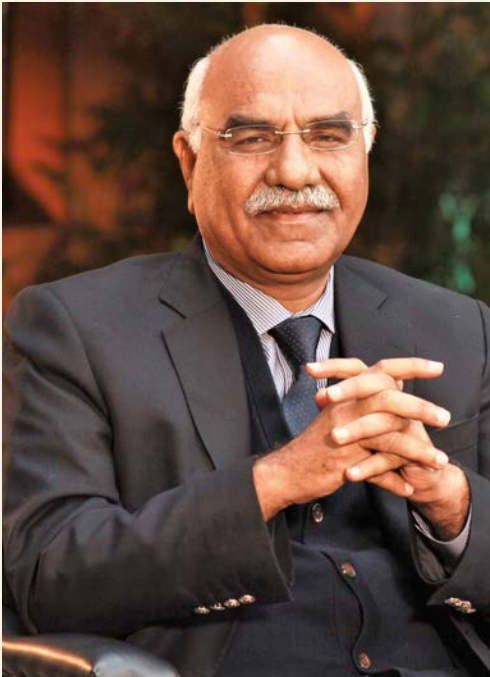
"If we don't fix this, we cannot fix the external sector, which will push us back towards the International Monetary Fund (IMF). In order for us to have growth and provide employment to our people, it is incumbent upon us that we fix our sector and we decrease our dependence on imported fuel," he said

Pakistan imported petroleum products worth \$17.033 billion, an increase of 95.84% during the first ten months of the current fiscal year (2021-22) as against the imports of \$8.697 billion last year, according to the latest data issued by the Pakistan Bureau of Statistics (PBS). Former Prime Minister and MNA Shahid Khaqan Abbasi, Tauseef H. Farooqi- Chairman nepra, Muhammad Ayoub-GE Regional director, Dr. Sardar Mohazzam-MD NEECA, Ali Hamdani-MD SNGPL, Hamza

Abdullah Ginlong Solis, Mr. Qu Ruichen-SUPCON, Julie Koenen-US-AID, Shah Jahan Mirza, Iqbal Z Ahmad, Talagala Jinko Solar, Syed Salman Mohiuddin Goodwe, Wang Bin Hualu Engineering, Waqas Bin Najeed, Halima Khan of energy update, Mian Fahad Growatt, Muhammad Ayoub, GE, Julie koenen, USAID, Asim Ayub, PD CPEC Authority, Zhang Zonergy, Ali Malik, Yellow door, Monaam Htiouech, Siemens Energy, Alexander Eykerman, Wartsila, Zaher Fawaz, Mitsubishi power Aero, Hashim Raza, CEO K Solar, Dr. Saeed Khan Jadoon, HDIP, Qu Ruichen, SUPCON, Ali Abdullah, Naji Abou Chedid, Honeywell, Adil Khattak, Attock Refinery Limited, Dr. Nawaz Virk & other also addressed on this occasion.



Pakistani philanthropist nominated for Nobel Peace Prize



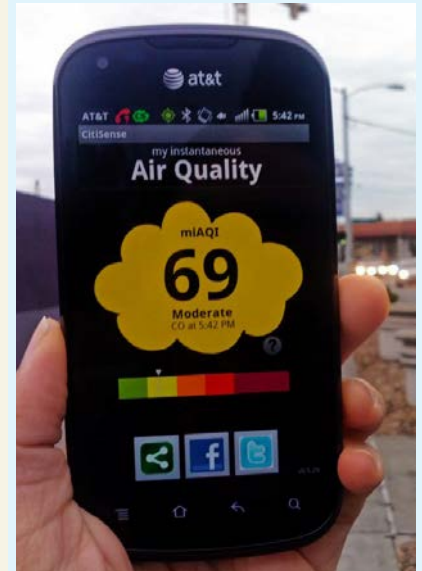
Dr Amjad Saqib, a Pakistani philanthropist and the founder of Akhuwat, the country's largest interest-free microfinance programme, has been nominated for the Nobel Peace Prize for his humanitarian work in poverty alleviation.

His organisation began in 2001 with 100 USD, and nearly two decades later, Akhuwat has grown into the nation's largest microfinance institution, distributing the equivalent of 900 USD million to five million poor families and boasting a loan repayment rate of nearly 100%.

There have been 343 nominations for the Nobel Peace Prize in 2022, including 251 individuals and 92 organisations from around the world.

"Dr Amjad, Chairman of the Akhuwat Foundation, stated on this prestigious occasion, "My services are beyond such awards, and they are purely for the sake of Allah."

Dr Amjad was also one of five recipients of the Ramon Magsaysay Award, named after a Filipino president who died in a plane crash, for his "first-of-its-kind" interest- and collateral-free microfinance programme, which has helped millions of poor families.



EPA gets latest gadgets to monitor pollution

The air quality monitoring in the federal capital has improved after the induction of the modern gadgets in the pollution gauging equipment of the Pakistan Environmental Protection Agency (Pak-EPA).

The International Centre for Integrated Mountain Development (ICIMOD) has handed over specialised equipment known as Environmental Dust Monitor to the Pak-EPA that can monitor very fine particles suspended in the air injurious to human health, an official of the environmental watchdog said while elaborating the details of the latest equipment.

He said that the air quality of the federal capital recently was reported consistently healthy since the past week as the ratio of air pollutants was recorded below the permissible limits in the atmosphere due to reduced vehicular traffic in peak hours.

He said that the air pollutants, mainly these fine particles, known as Particulate Matter (PM), can be of size 10micrometers (PM10), 2.5micrometres (PM2.5) and 1micrometer (PM1).

"When compared to a human hair, PM10 is 1/7th the width of human hair while PM2.5 is 1/30th of it. Such fine particles suspended in the air can originate from multiple sources, including dust; fire smoke; chemicals and pollutants from cars, trucks, buses, industries and brick kilns; construction sites, etc.", he said.

Power consumers given another tariff shock

—◆— Khaleeq Kiani —◆—

The National Electric Power Regulatory Authority (Nepra) has notified Rs2.87 per unit additional fuel cost adjustment (FCA) for ex-Wapda distribution companies (Discos) for March and Rs1.39 per unit FCA for K-Electric for consumption in February to provide Rs29bn and Rs1.59bn additional revenue respectively.

"Nepra has approved positive FCA of Rs2.8680/kWh having an impact of around Rs29bn to Discos," adding that it also approved FCA of Rs1.3863/kWh for February having an impact of Rs1.586bn to KE to be charged in the May bills to all except lifeline consumers.

It said the Discos had demanded FCA of Rs3.16 per unit with a financial impact of Rs32bn for March, while KE has requested Rs3.45 per unit FCA for February with a revenue impact of Rs3.95bn but the regulator scaled down FCAs for both set of entities, following verification of data and examination of evidence.

The regulator, however, did not notify yet another FCA of Rs4.83 per unit for March that it

had approved on April 27 to avoid a sudden price shock to consumers but would be notified subsequently for recovery from consumers in June.

The Central Power Purchasing Agency (CPPA), on behalf of all ex-Wapda Discos, had sought an increase of Rs3.16 per unit in FCA to Rs9.4 per unit for the electricity sold in March to generate about Rs32bn additional. It claimed that the consumers were charged a reference fuel cost of Rs6.23 per unit in March, but the actual cost turned out to be Rs9.4, hence an additional charge of about Rs3.16 per unit to consumers. It, however, disallowed a couple of claims and concluded the actual fuel cost for March at Rs9.1 per unit instead of Rs9.4 per unit claimed by Discos, hence allowing an additional FCA of Rs2.87 per unit.

Data shows that the share of domestic fuel sources in overall power generation in March was robust (45 per cent). The share of hydropower supply in the overall basket stood at 16.35pc in March, slightly lower than 18.22pc in February but significantly better than just 5.83pc in January. Hydropower share stood at 20pc in December, 33.2pc in November and 23.26pc in October. Hydropower has no fuel cost.

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Net-zero economy?

—♦— Maha Qasim | Dania Nasir —♦—

Net Zero refers to “a balance between man-made greenhouse gas emissions and their removal from the atmosphere”. To achieve this balance, GHG emissions must be reduced to near zero. Remaining emissions can be neutralised through long-term carbon-capture solutions such as planting trees or funding carbon-offset projects.

Recently, there has been renewed global commitment to address climate change. Over 70 countries aim to collectively reduce emissions from current levels to net zero by 2050. But national climate action plans fall short of the required emission cuts despite scientific consensus that the global temperature rise should be limited to 1.5 degrees Celsius above early 19th-century levels to avert a climate catastrophe.

While governments have been slow to act, the private sector is driving the climate agenda. Over 2,000 businesses and financial institutions have committed to reducing GHG emissions across their value chains in line with climate science. This momentum is driven by pressure from investors and customers for companies’ to limit emissions, and an understanding of the competitive advantages to be gained.

Some governments have introduced mandatory Environmental, Social & Governance disclosure regulations to force companies to acknowledge their ESG impacts and allow investors and consumers to make informed decisions. The US Securities & Exchange Commission has introduced proposals requiring companies to disclose climate risks facing businesses, and plans to address those risks along with mandatory disclosure of the companies’ climate footprint.

The European Union’s Sustainable Finance Disclosure Regulation and Corporate Social Responsibility Directive aim to improve the comparison of funds’ sustainability profiles by end-investors. India and Bangladesh have also passed similar legislation in line with global trends.

Pakistan already has green financial incentives in place

In Pakistan, the Code of Corporate Governance Guidelines (2017) make the company’s board of directors responsible for the “implementation of ESG and health & safety business practices including a report on corporate social responsibility activities and status of adoption/compliance”. Multinational corporations and those with an international clientele voluntarily publish annual sustainability reports that disclose their current ESG impact and future sustainability targets.

ESG disclosures enable companies to attract investors that are interested in sustainable growth, identify ESG-related business risks and opportunities, optimise resources and future-proof operations and supply chains with respect to ESG risks. Studies by NYU’s Stern Centre for Sustainable Business have found a tangible link between financial performance and a company’s ESG activities.

A review of 59 climate change or low-carbon studies related to financial performance, found on the corporate side that 57 [per cent] arrived at a positive conclusion”. With an established link between ESG disclosure and positive financial performance, more Pakistani companies should voluntarily track and report ESG performance.

A transition towards more sustainable production features a shift to renewable energy, innovative, high-efficiency manufacturing processes and closed production loops. Pakistan already has green financial incentives in place to support such activities. The State Bank of Pakistan’s Financing Scheme for Renewable Energy encourages a shift towards renewables. Askari Bank’s Ujala Finance offers “subsidised financing for sustainable energy projects to reduce consumption of traditional hydrocarbon-based energy sources”.

The Pakistan Business Council’s Centre of Excellence in Responsible Business notes that “in many emerging economies, where capital markets are the main driver for reporting — ESG metrics are increasingly on the stock listing requirements”. The Pakistan Stock Exchange also recognises the importance of disclosure on non-financial issues in its Annual Reporting Awards and awards points for “disclosures on gender representation and companies who report on at least [two] Sustainable Development Goals”.

Large Pakistani textile industry players are ahead in the ESG game with robust plans to decarbonise their supply chains, optimise energy, water and carbon footprints and conform to international sustainability best practices in order to remain competitive in the international markets. Meeting science-based emissions-reduction targets is critical from an environmental perspective but doing so also lowers the significant business and reputational risks faced by companies.

Pakistani companies need to act immediately to strengthen ESG reporting and progress towards sustainability commitments both for the climate and for the companies’ future competitiveness as they make the transition to a net-zero business environment. ■

Maha Qasim is an environmental and sustainability expert. Dania Nasir is a research analyst at Zero-Point.

Courtesy Dawn

OGDC profit soars 79%

The Oil and Gas Development Company’s (OGDC) net profit soared 79% to Rs43.16 billion in the third quarter ended 31 March 2022, mainly due to the rupee depreciation and surge in energy prices from the fields to the downstream industries.

The oil and gas exploration firm booked a profit of Rs24.12 billion in the same quarter of the previous year, the company said in a notice sent to Pakistan Stock Exchange (PSX) on Thursday.

Accordingly, the board of directors of the company has recommended an interim cash dividend of Re1 per share for the quarter ended March 31, 2022. This is in addition to interim dividends already paid at Rs3.75 per share during the year.

The new entitlement would be paid to those shareholders whose names would appear in the register on May 12, 2022. Cumulatively, in the first nine months (Jul-Mar) of the current fiscal year, the exploration firm booked a net profit of Rs112.04 billion, which was 69% higher as compared to Rs66.35 billion recorded in the corresponding period of the previous year.

The net sales of the company increased 36% to Rs89.10 billion in the third quarter as compared to Rs65.4 billion in the same quarter of the previous year.

The surge in sales was seen on the back of “66% hike in oil prices and 11% rupee depreciation against the US dollar”, Arif Habib Limited (AHL) analyst Muhammad Iqbal Jawaid said in a post-result commentary.

However, the oil and gas production dropped by 7% and 9%, respectively, in the third quarter, he said. The exploration cost settled at Rs2.8 billion in the quarter under review, dropping by 50% year-on-year.

Other income swelled by around five-times to Rs8.35 billion in the quarter against Rs1.62 billion in the same quarter of the previous year “on account of exchange gains on foreign currency along with higher interest income on cash and cash equivalents,” he said. ■

ZONG report highlights transformation of over 10 million lives

Zong, Pakistan's cellular and digital services frontrunner, has launched its Sustainability Report 2021, highlighting the powerful impact that the company made last year on over 10 million lives across nine cities of Pakistan through diversified social initiatives.

Staying true to the sustainability commitment, the environment-friendly report was printed on recyclable paper. More in more, through an industry-first initiative, the company also shared seed papers to take forward its pledge toward a clean and green Pakistan.

According to Zong, the year 2021 was yet another successful year where it maintained its position as the digital and sustainability leader, with values of accountability and integrity inculcated in its culture and the company making strides to create an impactful change in Pakistan.

The thematic focus of Zong's social endeavours in 2021 was on critical areas including e-health, e-education, environmental stewardship, civic responsibility, and gender & social inclusion. A special focus on gender inclusion with equality at work has also been highlighted as a key priority for Zong.

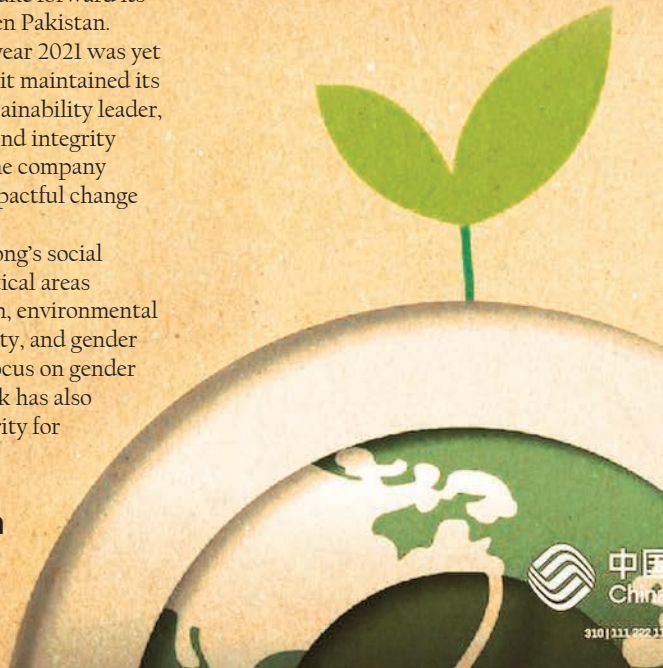
Impact On E-Health

Zong made a massive impact on e-health reaching 125,500 beneficiaries (114,740 females and 10,760 males). Some

of the initiatives on this front included yoga and fitness session for special children, a partnership with Sehat Kahani to provide free e-consultations during the Covid-19 pandemic, digital anti-tobacco and Covid awareness sessions by SKMC, a breast cancer awareness drive, and more.

Impact On E-Education

Through its e-education initiatives, Zong reached over 22,250 beneficiaries (15,400 females, 6,850 males). Some of the major steps Zong took included setting up digital labs at Pak-China Friendship School (Gwadar), Maulvi Abdul Haq School (Karachi), The Star School (Okara), and more. Zong volunteers also extended their support to SOS Village (Sialkot), among other measures. ■



PM removes 17pc GST on solar panels

In a move to encourage power generation through alternative energy sources, Prime Minister Shehbaz Sharif announced removal of 17 per cent general sales tax on solar panels imposed by the previous government, claiming that it is only way forward to reduce the country's oil import bill that stood at \$20 billion amid the fast-rising prices of the US currency that has crossed the barrier of Rs200.

"Announcing the immediate abolition of 17pc duty on solar panels, the prime minister stressed the need for a compulsory solar geyser policy for every household," said a statement issued by the PM House

Solar energy Beaconhouse saves 4,000 MWh power

Beaconhouse Group, Pakistan's largest network of private educational institutions and a host of diverse businesses, is successfully running 40 of the network's facilities on solar energy. Students of 26 Beaconhouse campuses conducted research projects on solar energy's impact on reducing the use of non-renewable energy.

This announcement commemorates International Earth Day 2022 aimed at raising awareness on protecting the planet and adopting environmental-friendly business practices.

Installed by Beacon Energy Ltd (BEL), a venture of the Beaconhouse Group, the solar panels installed at schools and other buildings under Beaconhouse have altogether achieved a carbon offset of 4,459 megawatts-hours in the past two years. This reduction in carbon emis-

sions is equivalent to the impact created by a plantation of 52,000 trees.

Nassir Kasuri, Executive Director at Beaconhouse, and Chief Executive Officer of BEL said, "At Beaconhouse, as a socially responsible organisation, we take mitigating the impact of climate change as a top priority and are constantly implementing sustainable practices and policies to reduce our carbon footprint in everyday operations." ■





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Mr. Waseem Ashraf Qureshi

CEO of Kilowatt Labs, Enercap, WRL & Infusion Group

Waseem Ashraf Qureshi is the inventor of the world's most advanced energy storage, Sirius Supercap Energy Storage. Waseem's genius is not only in the innovation itself, but also in its commercial rollout both as a product and the infrastructure he has created to ensure this becomes a product for all applications throughout the world. Sirius Supercap Storage has allowed the industry to significantly advance both in terms of broadening renewable energy deliverance as well as reduction of carbon footprint across the value chain. Its ability to work in extreme temperature conditions, cycle up to 1 million times (Cell Level), charge extremely fast, utilize the entire name plate capacity, have a round trip efficiency of 99.1% and a high energy density, is transforming how storage is used in residential, commercial, industrial, EV, marine, aviation, space, defense, utility, microgrid, healthcare industries, to name a few.

A serial visionary inventor, Waseem has also developed the world's first Enercap capacitor technology, a graphite-ion based energy capacitor, with a solid-state dielectric and proprietary embedded electronics that monitor it, that has an energy density significantly higher than any solid state battery technology being developed. The Enercap capacitor can be shaped, bent and cut to size and can be deployed as structural storage in any application – from cell phones, laptops, tablets to vehicle and airplane bodies.

Waseem is an entrepreneur, inventor, strategist and visionary, based in Dubai, United Arab Emirates where he has built the largest supercap energy storage factory in the world from where the product is supplied to 53 countries. He also leads the largest R&D division in power electronics in the GCC and is the CEO of Enercap Holdings, Kilowatt Labs, Inc., WRL Technologies Inc., Infusion Power Industries and Infusion Solar Energy Systems LLC.

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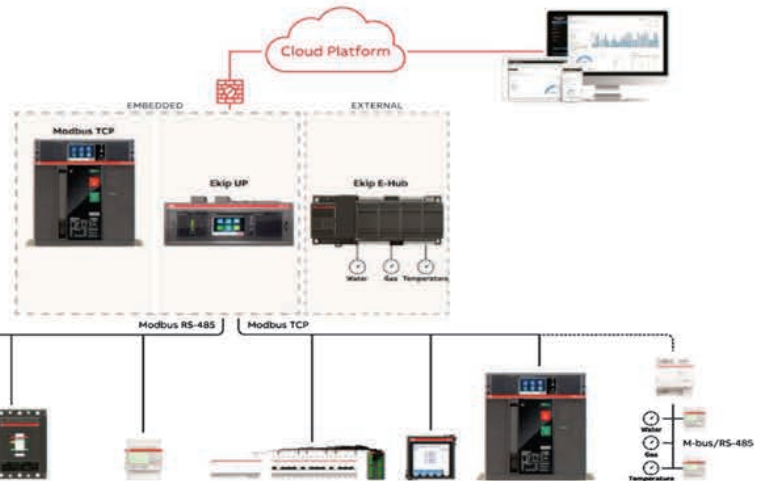


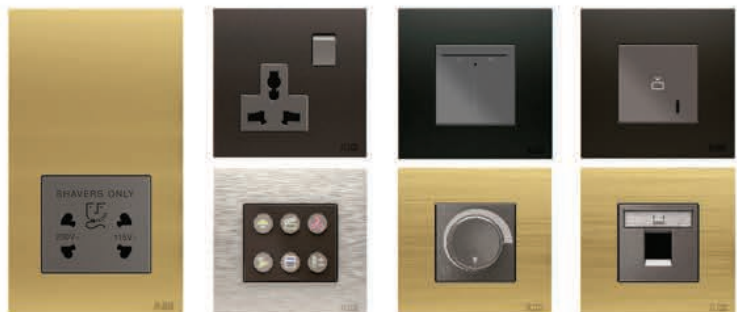
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