



MONTHLY **Energy** UPDATE

ISSN 2309-6578

Wind Energy: the future's solution

Why wind energy projects in
Sindh inordinately delayed?

Pakistan to go dry in a decade

How China will transform
Pakistan's economy

Special Report:
International Wind Energy
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From the editor's desk...

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Gas tariff increase, govt gives shockwave to the consumers

The present regime has once again dropped the bomb on the poor masses of a substantial increase in gas prices. The 36 per cent in gas tariff is such a big burden on the consumers already fed up with this government that is making people's lives a hell with its indiscriminate increases in utilities and commodities. It was an abrupt move that has come with shockwave to the common man. The Oil and Gas Regulatory Authority (OGRA) has decided to increase gas price by 36% for the ongoing financial year (2016-17).

A former Prime Minister, Shaukat Aziz who was an alien to the nation when he was induced in the government, had linked the gas tariff with the prices of crude oil in the international market and let it fluctuating rather spiralling. The former PM had done this on the behest of IMF and World Bank when he signed an agreement for a stand-by loan of just \$597 million. The original agreement was meant for bringing all the fuel and energy prices at par. It seems that the present Finance Minister, Ishaq Dar is implementing the same agreement religiously. It's not that surprising for us that OGRA has sought massive hike in gas rates even though global oil prices have slumped by more than 50% in recent past because it was just the outcome of obeying his masters and any increase in oil and gas or energy is not linked with the price fluctuation in the international market.

The gas distribution companies i.e. SSGC and SNGC on the other hand had demanded the highest possible increase to tone down their massive losses and the theft besides corruption of billions of rupees in the recent past.

The government has been enforcing a policy of maintaining higher gas prices thus far. Therefore, the government would implement the price for the SNGPL across the country and SSGC consumers would also be facing an increase in gas prices despite OGRA's tariff reduction. The differential in prices between prescribed and notified by consumers would go to the provinces in the form of gas development surcharge (GDS).

The regulator approved Rs201 billion operating income and Rs161 billion operating expenditure for the SNGPL. It also approved Rs39.5 billion operating profit for the SNGPL. OGRA approved Rs175 billion operating income and Rs140 billion operating expenditure for the SSGC in addition to an operating profit for SSGC of Rs35.4 billion.

Though regulator has rejected an SNGPL request to increase the benchmark of unaccounted-for-gas (UFG), allowing the company to recover 4.5% of total losses from consumers, it was another effort to squeeze the consumers to compensate the company's inefficiency by robbing the consumers. Due to high losses, the company will have to face a seven billion-rupee hit on its profitability. The SSGC had requested to set the UFG benchmark at 7% - but the regulator set it at 4.5%. The regulator has sent its decision to the federal government seeking advice for a price notification for different categories of consumers. Currently, the government is cross-subsidising gas prices for different consumers, including domestic by putting burden on other consumers.

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Published by M. Naeem Qureshi for Energy Update
& Printed at Print Vision, Karachi Cell: 0333-2244586

Wind Energy - Creating a Win-Win Situation

It's time now to consolidate wind energy in the country

With eleven 50 MW wind power projects on-line already, the wind energy is quite a well-established industry in Pakistan. It is the time now to consolidate the wind energy in Pakistan by taking supporting measures like: Introduction of a tariff regime which favors all the stakeholders, in particular the consumers, increase of wind energy integration in the utility networks by using technological advancements and meeting our global commitments on climate change.

Tariff Regime: The basic purpose of a tariff is to create an enabling environment for the investors to invest in a particular area in the shortest possible time frame thereby creating an overall benefit for the general public. The way the Wind Tariff Regime has been handled up till now defeats this very purpose.

Further, the short tariff validity after drastic reduction in the tariffs using unsolicited data render the Wind Projects in Pakistan quite un-viable and un-bankable. For NEPRA, the general basis of reduction in tariffs has been increased capacity factor due to technology advancements coupled with simultaneous reduction in per MW cost, which is not quite understandable.

The Capacity Factor: Increase in capacity factor and decrease in per MW cost cannot occur simultaneously. The increase in capacity factor from a reference capacity factor requires: Increase in average wind speed - site specific, NEPRA should reveal sites of higher average wind speeds than the Gharao corridor. In Pakistan higher wind speeds are available in areas where infra-structure does not exist (communication such as transport and electrical). This would drastically increase the per MW cost of the project. Increase in the swept area of the turbine - this means bigger turbine. This generally increases the per MW cost due to increase

in transportation costs, heavier foundation, bigger installation machinery etc.

It should also be noted that wind data provided by AEDB (mostly extrapolated), and utility data provided by NTDC and data available on the websites of various Govt. agencies is not correct. The investors have to carry out in-house confirmatory studies or employ expensive wind resource consultants to obtain a workable data. This also adds to the per MW cost for Pakistan projects as the risks are to be factored in.

Further, the current changes in Pakistan Wind Regime in Thatta/Gharao Corridor due to global warming and increased temperature only lead to an increase in the capital cost to establish a safe, secure and reliable WPP.

A higher capacity factor of WPPs can however be achieved at a relatively minimum increased cost, if the following is done: Hybridization of WPPs with PV Solar and conventional plants is encouraged. In Gharao Corridor maximum wind is available during evening hours. During day time sun is available. Wind & Solar complement each other in Gharao Corridor. This can bring the capacity factor of a Wind Solar Hybrid plant close to 50%.

Hybridizing wind with solar and other alternative resources can be a game changer

WPPs are encouraged to bring in latest converters (full converters) which can supply reactive power to the network even when there is no wind. If a WPP is not running to its full capacity which it will during most of the year, the rest of the capacity can be supplied as the much required "reactive power" to the network. If a reactive power tariff is given out the investors will be



encouraged to bring in state of the art equipment helping network stability.

The WPPs are already supplying a substantial amount of reactive power to the network for which they are not being paid whereas the utility is charging its consumers for the reactive power being supplied to them. In the rest of the World, the WPPs deliver power at the point of common coupling at unity power factor only.

In all fairness NEPRA should issue a Reactive Power Tariff to compensate for the increase in per MW cost of Pakistani WPPs for installing power factor improvement plants, within their WPPs, for which they are not being paid.

The per MW cost: The per MW cost involves a number of factors. But one thing is very clear that unless there is a substantial Local Value Addition (LVA), the per MW costs will remain high. To begin with we can start manufacturing Wind Turbine Generator (WTG) Towers locally in concrete. WTG towers are generally manufactured in steel. For Pakistani Wind power Projects (WPPs), this heavy and large equipment needs to be imported. As a thumb rule for a 50MW WPP, the cost of the steel towers is around USD 7-8 million. Another USD 1-1.5 million is required for transportation and insurance. If the towers are manufactured in concrete (local steel, crush and cement) which is quite normal for hub heights above 100 meters, there will be: huge cost savings in foreign exchange, no fuel burnt for transportation and creation of jobs.

Manufacturing Concrete Towers locally has multiple advantages

Though the current per MW cost for wind projects has reduced considerably world-wide due to technological advancements, the following need to be

With eleven 50 MW wind power projects on-line already, the wind energy is quite a well-established industry in Pakistan. It is the time now to consolidate the wind energy in Pakistan by taking supporting measures

done additionally in Pakistan to come to a reasonable cost: NEPRA/NTDC to provide enabling environment to the R E Projects, especially by reducing bureaucratic procedures. Utility performance to be improved by strengthening their networks. At least the NEPRA standards of SAIFI & SAIDI are adhered to by the utilities. Indigenous production of R E equipment to be encouraged by proper policy framework and legislation. Requirement of N-1 criteria is removed from the Grid Code. Due to this criteria 100% redundancy is required for Power Transformers of the WPP substation. WPPs around the world do not require to fulfill N-1 criteria. This requirement is generally for the utilities. However 99% of DISCO grid stations throughout Pakistan do not fulfill this criteria. NTDC to ask for WPP substation in AIS only. A GIS substation is expensive and none of the grid stations in HESCO

network have GIS.

Network Performance

The most important factor for high capacity is the performance of the off-taking utility. NEPRA State of the Industry Report 2014 gives SAIFI and SAIDI for HESCO as 230 Nos. (max. allowed 13) and 16678 minutes (max. allowed 14 minutes).

To provide a WTG which can cope reasonably with such miserable performance of a utility without getting seriously damaged requires huge investment in the protection system of the WTG.

Further, the short circuit levels of the utility network are bound to increase due to the expected generation to be fed into the network over the term of the project. A WPP has to cater for this expected increase in the short circuit levels from the onset. It has to buy expensive equipment with higher short circuit withstand capability from the beginning thereby increasing the per MW costs.

Furthermore, a WPP has to cater for the weak utility network. A certain amount of reactive power has to be supplied by a WPP in Pakistan which is not being paid to it. There is a big initial investment to be done by a WPP for this service to support the weak utility network in Pakistan. This amount should be added to the per MW cost also. Further the WPPs should be paid for the reactive power which is demanded by the utilities as is normally done throughout the world. A separate tariff needs to be worked out for the supply of reactive power. Till such time however the current tariff should be increased.

NEPRA State of the Industry Report 2015 also states that 30% of the 220kV lines and more than 50% of NTDC Power Transformers are overloaded. As planned by NTDC, the 220kV network would be





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Wind power plants in Sindh

Why inordinate delay in completion of projects?

The wind power generation in Sindh province has become a mystery as we are hearing that the wind power generation to the tune of 1,530 mega watts will soon be added to the national grid very soon. sometimes they claimed that it would be done in just one year's time, sometimes they say wind power projects would be completed very soon, probably end of this year. But the commitment remains unfulfilled as we yet to see any significant breakthrough in wind power or for that matter solar energy across the province.

The history of wind power's projects goes back to about two decades back when the then government had allotted a huge land to over 22 investors in Jhimpir and its surroundings to set up power plants by importing turbines from abroad.

The cheap and environmental-friendly wind energy, introduced late in Pakistan, is gaining popularity as it ensures quick return in a short cycle of three years, however, we don't see any major breakthrough or

The Ministry of Water and Power that Pakistan has a 1,046 km coastline in the South (Sindh and Balochistan), but most of the wind power projects are currently

being installed in Jhimpir- Gharo-Keti Bander and Hyderabad wind corridor. Nine wind turbine generator (WTG) projects are claimed to be in advanced stage of development, while the other nine are under-construction and four have got their letters of intent (LoIs). Many more are under process and documentation. The estimated energy potential of the wind corridor is 50,000 MW. Besides Gharo, several other sites have been identified in coastal areas of Balochistan and Northern areas.

Presently five WTG projects each with 50 MW capacity are operating at Gharo-Jhimpir wind corridor. However, the nine other WTG projects which are in the phase of development will produce 450 MW and those in the stage of construction will produce 480 MW wind energy. Similarly, four projects which have been given LoIs will produce 350 MW.

Responding to a question, Mohammad Kasim Hasham, whose company Uni-Energy has recently been extended LoI, said that with 100 per cent foreign financing the total cost of wind power project comes to \$107.50 million, and in case of local financing the cost is estimated at \$113m. The annual operational and maintenance

cost in both the cases is only \$2.196m.

Javed Akhtar group in joint venture with Tapal and Candyland is also setting up 30 MW capacity WTG project that will become functional early next year. He lamented the loss of time in introducing wind power, but was optimistic that private sector would actively engage and pull the nation out of energy crisis. He said his other company Dairyland with over 300 cow-heads is nearby in the Gharo-Jhimpir area and will get the power from wind which is cheap and pollution free.

As a matter fact wind power project is easy and fastest to be commissioned and to start generating power and this is not over three months if using latest technology but what is the reason for inordinate delay in commissioning of the wind power turbines especially when the government has already issued licenses and allotted land to these companies? Lack of trust on the government policies, feeling insecure or something else? Some say that many of these investors have occupied the big land and set up picnic or dairy farms instead of setting up power plants. What is truth the government should investigate into the matter. ■





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Environmental degradation is hurting our economy

Karachi needs to plant one million trees to change the environment

Pakistan is facing many environmental problems that are affecting its economy. One of the greatest problems is that Pakistan is a large importer of both exhaustible and renewable natural resources and a large consumer of fossil fuels. The Ministry of Environment is responsible to conserve and protect the environment.

Current issues include water pollution from sewage, industrial wastes, and agricultural runoff; inefficient use of limited natural fresh water resources; a majority of the population does not have access to potable water; deforestation; soil erosion and desertification.

In 1987 only about 6 percent of rural residents and 51 percent of urban residents had access to sanitary facilities. This means that half of the population is deposited on roadsides, into waterways, or incorporated into solid waste. There are only three major sewage treatment plants exist in the country; two of them operate irregularly. Much of the untreated sewage goes into irrigation systems, where the wastewater is reused, and into streams and rivers, which become sewage carriers at the time of water shortage. These vegetables grown from such wastewater have serious bacteriological contamination.

However, now potable water is brought within reach of the people; nearly half the population had access by 1990. The researchers at the Pakistan Medical Research Council said that a large proportion

of diseases in Pakistan are caused by the consumption of polluted water, 1990s. About 38 percent of the population that receives its water through pipelines is on the risk of consuming contaminated water in different areas. For example in Punjab about, 90 percent of drinking water comes from groundwater, as compared with only 9 percent in Sindh. This is the major cause of death in Pakistan, is transmitted through waterborne pollutants.

In 1992 Pakistan's National Conservation Strategy Report outlined the state of environmental health, its sustainable goals, and viable program options for the

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For example in Punjab about, 90 percent of drinking water comes from groundwater, as compared with only 9 percent in Sindh.

The other concern to environmentalists is the diminishing forest cover in watershed regions of the northern highlands, which has only recently come under close scrutiny.

Motor cycles and scooters are major polluters in the big cities. Moreover, low lying land is generally used for solid waste disposal, without the sanitary landfill methods. Unsound disposal of Municipal Solid Waste in Pakistan has reached 95pc in 2012. The National Conservation Strategy has



raised concerns about industrial toxic wastes that are also being dumped in municipal disposal areas without any record of their location, quantity, or toxic composition. Another important issue is the contamination of shallow groundwater near urban industries that discharge wastes directly into the ground.

Air pollution has also become a major problem in most of the big cities. There are no controls on vehicular emissions, which account for 90 percent of pollutants. The National Conservation Strategy Report indicated that the average Pakistani vehicle emits twenty five times as much carbon monoxide, twenty times as many hydrocarbons, and more than three and one-half times as much nitrous oxide in grams per kilometer as the average vehicle in the United States.

Another major source of pollution is noise. The rapid urbanization indicated in Pakistan since the 1960s has resulted in loose controls for heavy equipment operation in densely populated areas, as well as in crowded streets filled with buses, trucks, automobiles, and motorcycles, which often honk at each other and at the horse drawn tongas (used for transporting people) and the horse drawn rehras (used for transporting goods).

Natural disasters in Pakistan

It includes frequent earthquakes which are often severe especially in north and west and severe flooding along the Indus after heavy rains in July and August. Landslides are common in the northern mountains.

Effects of global warming on South Asia

Mountains in northern Pakistan have grown significantly affected over the past century than they had been over the last millennium, possibly due to human induced global warming. In Karakoram and Himalaya mountains in northern Pakistan, the upper reaches of the Indus Valley, (which supplies the world's largest irrigation network), a group of researchers collected samples of Juniper tree rings that dated back as far as 828.

Economic Effects

The availability of natural resources is limited due to the dry climate and mountainous terrain. Population is

Large proportion of diseases in Pakistan are caused by the consumption of polluted water, 1990s. About 38 percent of the population receives its water through pipelines is on the risk of consuming contaminated water in different areas. For example in Punjab about 90 percent of drinking water comes from groundwater as compared with only 9 percent in Sindh.



growing and putting pressure on the resources. Human transformation of the environment is creating several problems. Population growth and poor water infrastructure have reduced per capita water availability from 53,000 cubic meters to 1,200 cubic meters, and heavy reliance on firewood has contributed to the world's second highest rate of deforestation. Agricultural practices have resulted in soil erosion, groundwater degradation, and other problems have reduced crop output and increased health problems for rural communities. Solid waste burning, low quality fuels, and the growing use of fuel inefficient motor vehicles have contributed to air pollution in some cities.

like, Islamabad, Lahore, Peshawar, Quetta, Faisalabad and Rawalpindi, has exceeded levels deemed safe by the World Health Organization. Droughts because of dry climate have also affected the economy of the country.

Conservation Efforts

The government has expressed concern about environmental threats to economic growth and social development and, since the early 1990s, has addressed environmental concerns with new legislation and institutions such as the Pakistan Environment Protection Council. Yet, foreign lenders provide most environmental protection funds, and only 0.04 percent of the government's development budget goes to environmental protection. Thus, the government's ability to enforce environmental regulations is limited, and private industries often lack funds to meet environmental standards established by international trade organizations.

Plant More Trees

There is a need for more tree plantations especially in urban centers. In Karachi alone we need to plant as many as one million fully-grown trees in order to change the . Trees must be considered as an essential item of environment betterment. Cutting of forests should immediately be stopped. Pollution from factories, Greenhouse effect Pakistan, Carbon monoxide emissions in Megacities like Karachi and Lahore, due to running of old vehicles on road should be controlled. ■

Water scarcity looming in the country

Pakistan may face drought like situation in a decade

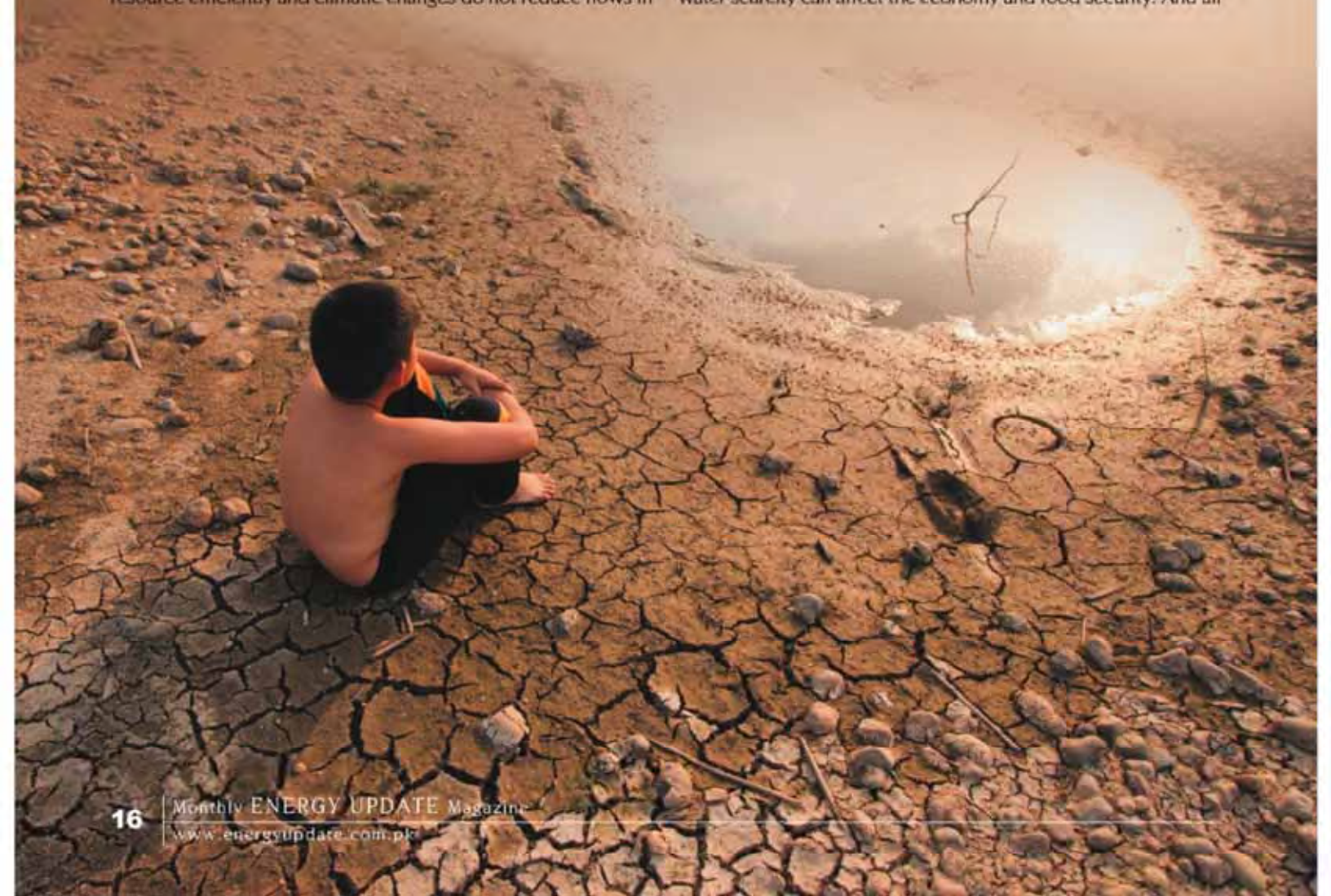
The growing water scarcity may be the next biggest threat, after terrorism, to the country. Pakistan may also face an internal security problem, for people and economy. The country is already classified as one of the most water stressed countries, because of climatic change, population growth and inefficient use of the resource yet the biggest reason is total failure of the successive governments to build large and smaller dams or establish reservoirs to preserve big amount of water lost every year.

Water shortage is fast developing and different studies show that per capita water availability has declined, since Pakistan came into being, mainly due to population growth. The people have access to only one fifth of the water they had at the time of independence. The population is predicted to double by 2050, meaning that the people will have access to just half the water in 2050 they presently have even if they start using the available resource efficiently and climatic changes do not reduce flows in

the Indus river system.

The country may face a drought like situation in next 12 years from today, if immediate measures are not taken to enhance storage and conservation capacity. An ADB report indicated the need for increasing the storage capacity. Presently, the quantity of water in reserve, in case of an emergency, is for 30 days supply which is far below the recommended 1,000 days for countries with a similar climate. The cities are already experiencing reduction in water availability owing to excessive pumping of ground water. Water shortages may create political, economic and social problems. The increasing demand for water for both agricultural and nonagricultural use is already manifesting themselves in the form of interprovincial water disputes.

Some experts say that water wars in South Asia may erupt which is one of the world's most water stressed regions. Moreover, water scarcity can affect the economy and food security. And all



this happened because of successive governments have failed to invest in this sector. The situation demand careful use of water, the development of more storage capacity, resolution of provincial water disputes as well as engagement with India to find a peaceful solution to trans boundary water sharing.

Clean Drinking water

The Higher Education Commission (HEC), is playing its pivotal role in resolving safe water related issues in the country. In this regard, collaboration with leading American and British universities has been established to undertake joint research projects throughout the country.

According to details majority of the population does not have access to clean drinking water and as a result, more than 40 percent of the reported diseases in Pakistan are water borne. An estimated 250,000 child deaths occur each year in Pakistan due to water borne disease.

Under Pakistan, US Cooperation Program, there are number of research projects have been initiated which include: Assessment and Development of Renewable Groundwater Resources in the Quetta Valley, Pakistan under the joint collaboration of the University of Balochistan, the Western Michigan University and the University of Houston, USA, Removal of Arsenic from Drinking Water Using Iron Ores as Low Cost Reactive Adsorbent Media between the University of Engineering and Technology (UET) Pakistan and the University of Arizona USA.

Capacity Building for Research, Education and Training in Water Resources Management in Pakistan between the UET Pakistan and the University of South California USA, Small Scale Sewage Treatment and Wastewater Reuse System for Pakistan between the Quaid-e-Azam University Pakistan and the George Washington University USA and Water, Sanitation, Health and Hygiene Interventions in a Northern Pakistani village between the Karakoram International University Pakistan and the National Institute of Health USA.

Similarly, a number of projects have been undertaken with the British universities under the International Strategic Partnerships in Research and Education (INSPIRE).

Lead researchers from both countries have shared expertise through bilateral research exchanges and capacity building in various projects including: Development of Water Scarcity Management Strategies in the Upper Indus Basin between the UET Lahore and the Newcastle University, and

Use of Geo synthetic Materials to provide Clean Well Water between the Textile Institute of Pakistan and the University of Bolton.

Facts About Water & Sanitation

- 663 million people, i.e., 1 in 10 lac access to safe water.
- 4 billion people, i.e., 1 in 3 lac access to a toilet.
- Twice the population of the United States lives without access to safe water.
- 33 percent of the global population lives without access to a toilet. More people have a mobile phone than a toilet.
- A review of rural water system in eight countries in Africa, South Asia, and Central America found an average water project failure rate of 20 to 40 percent.
- Globally, 33 percent of all schools lack access to safe water and adequate sanitation.
- In low and middle income countries, 33 percent of all healthcare facilities lack a safe water source.
- The water crisis is the number one global risk based on impact to society, the World Economic Forum said in January 2015.

Country may face drought committee warned

Increase in water scarcity is likely to cause a drought like situation in the country by 2025 if immediate steps are not taken to improve storage and conservation capacity. Pakistan is among the few countries worst hit by water shortage and is fast moving towards drought conditions. Water and Power Secretary, Saifullah Chattha, warned and said unless storage and conservation capabilities are not increased Pakistan have to face drought. The country must develop additional storage capacity on an urgent basis.

Water use

Dr Zafar Altaf said the million dollar question is how to increase the quantum of water. By definition it is water which will always be a limiting factor. In the mid-nineties the Agricultural Commission laid down the new institutional arrangement that would be required for a meaningful utilization of the water resources. Water and Land Authority WALDA gave proposals which were not implemented till today.

Proposals include interventions-terracing, land leveling with laser technology, small dams and mini dams. The agricultural side for water utilization is completely ignored. This is because there

seems to be no interactions between the water and the agricultural institutions and WALDA was supposed to fulfill that requirement. Almost two decades have been lost since that report.

The encroachment for urbanization ate almost agriculture land to about 3 million hectares by last count. To add more to the complexity who will determine the selection of appropriate planting rate and frequency or what is called agronomic practices. Even these practices have given way as the more efficient ways of doing things is determined by the

Challenges in the Water Sector

The water problems in Asia cities are similar. These include sources and uses of raw water, the large proportion of water loss in distribution networks, intermittent supply, and the quality of tap water. In some cities, the excessive use of groundwater resources has caused serious environmental problems, including rapid depletion of groundwater, deterioration of water quality, and land subsidence. Many cities suffer from inadequate sewerage networks and wastewater treatment systems while a large majority still depends on septic tanks and other on site sanitation facilities. As a result, pollution loads in freshwater bodies and groundwater sources have increased substantially.

The cities are struggling to provide clean and reliable water supply to their residents. These include the physical scarcity of water, lack of investment funds in the water sector, unwillingness of authorities to charge the poor for their water consumption, and the lack of capacity of service providers in the public sector. All of these are symptoms of the fundamental reasons for these problems, which are inadequate leadership and governance, said a report.

The report further indicated that required not only to be "emergency-ready" to provide water and sanitation but must also be able to mitigate the impact of floods through flood control measures that safeguard water installations and minimize dam ages.

However, the Asian water crisis is, in fact, a crisis of governance said ADB, 2007.

Mr Chattha informed the committee that China had offered to provide 3,500MW through the Khunjab pass. It was currently in the initial processing stage while the government was actively pursuing 1000-CASA (Central Asia South Asia project) because \$1.2 billion funding arrangements were already in place. Electricity from the project will be available to the system by 2017. ■

Wind energy:

A potential yet to be exploited

Despite concerted efforts by local as well international investors and the government authorities, the progress on installation of wind power generation projects in Pakistan is quite slow owing to non-availability of the required infrastructure including transmission lines, grid stations as well as attractive tariff to sell the power to the national grid. The extraordinary delays in announcement of the tariff for wind power generation is said to be a vital reason for snail's pace in development of wind power plants.

The government expects to add over 1,000 MW power only through wind power projects by the election year, 2018. But this seems to be an arduous job as the investors are mainly reluctant to put their money into wind power generation due to uncertain economic conditions and policies and non-availability of adequate infrastructure.

A Norwegian company, NBT had expressed its interest to install Asia's biggest wind power project in Sindh few years back with a capacity of 500 MW, involving an investment of US \$ 1 billion, but the dream remained unfulfilled, as the international investors had to pull out their plans due to red tapism. There were differences on the terms and conditions for installation period of the power plants as well as "unattractive" tariff. For a unit of 50 MW power plant, a usual commissioning period of 18 months is allowed, but the government asked the potential Norwegian investors to install a unit of 250 MW project (two of 250 would have been installed) within the same period, which was unacceptable and unworkable for the company, thus it declined to initiate the project.

Wind power is considered as the clean and environmental-friendly energy and supposed

to have a big potential of electric power for the power-starved country, but Pakistan has started working on this source of energy very late. In the year 2002, Pakistan Council of Renewable Energy Technologies (PCRET) installed 14 small wind turbines, six of 500W each and eight of 300W each in Sindh and Balochistan coast. These turbines were imported from China and installed for demonstration purposes. Out of these, eight were installed in the coastal belt of Balochistan and six in the coastal area of Sindh.

The wind power projects need one time investment and there is no concurrent cost of fuel for these plants. But these power plants need heavy investments and imported technology and equipment, which are still not produced at home. For example, the Jhimpir Wind Power Plant, the first wind power plant in Pakistan developed by Zorlu Energy Pakistan a local subsidiary of a Turkish company spent \$136 million on setting up of a 50MW wind power plant, which was completed in 2002.

Currently wind power plants are mostly being installed in Sindh's coastal belt, which is spread over 9,700 sq km. The Balochistan coast has also potential to generate wind power. Aghore, Gaddani, Liari and Hubchoki sites in Balochistan have high values of wind power generation.

Pakistan Meteorological Office has estimated that 41.6 GW

power can be generated only in Balochistan coast, which is about 2 times the current power generation installed capacity in Pakistan.

The projects in Sindh are mostly installed in Jhimpir, Gujju and Gharo in Thatta district. According to Pakistan Meteorological De-

The government expects to add over 1,000 MW power only through wind power projects by the election year, 2018. But this seems to be an arduous job as the investors are mainly reluctant to put their money into wind power generation due to uncertain economic conditions and policies and non-availability of adequate infrastructure.

partment's survey, Sindh's coastal areas have exploitable potential of power generation of 11,000 MW. The gross wind power potential in the entire coastal area spread over 9,700 sq km in Sindh is whopping 43,000 MW, the Met office estimates, but due to high cost and the areas utilization constrains, this target is hardly achievable.

Wind Power Scenario

Total installed capacity of power generation in Pakistan is estimated at 22,800 MW, but all the power plants are producing just 12,000 MW with a peak time demand of 19,000 MW, thus there is a short fall of around 7,000 MW, which is filled by resorting to load-shedding across the country, 6 hours in urban areas and 8 hours in rural areas.

Currently at least six wind power projects with a cumulative capacity of 308.2 MW are producing electricity and connected to the National Grid. FFC Energy Limited is producing 49.5 MW, Zorlu Enerji Pakistan (Pvt.) Ltd 56.4 MW, Three Gorges First Wind Farm Pakistan (Pvt.) Ltd 49.5 MW, two units of Foundation Wind Energy Ltd. 50+50 MW (100 MW) and Sapphire Wind Power Company Ltd 52.8 MW.

At least nine more projects with a cumulative capacity of 477 MW are also in the advance stage of completion as they have acquired financial close. Prominent among them are: Yunus Energy Limited (50 MW), Sachal Energy Development Pvt. Ltd. (49.5 MW), Metro Power Company Ltd. (50 MW), Tapal Wind Energy Pvt. Ltd (30 MW), United Energy Pakistan Pvt. Ltd (99 MW), Hydro China Dawood Power Pvt. Ltd. (49.5 MW), Master Wind Energy Pvt. Ltd (49.5 MW), Tenaga Generasi Ltd. (49.5 MW), Gul Ahmed Wind Energy Ltd. (50 MW).

All the energy, produced by both state-owned hydro and thermal power companies and independent power producers (IPPs) do not reach to the consumers, as estimated 25 percent power is lost on the way due to faulty distribution system, mismanagement, theft or poor and age-old transmission lines.

The National Transmission and Dispatch Company (NTDC) is currently operating and maintaining 12 grid stations of 500 KV and 29 grid stations of 220 KV in Pakistan with 5,077 km of 500 KV transmission line and 7,359 km of 220 KV transmission line across the country.

The main concern of the wind power producers is lack of grid and transmission facilities. NTDC claims that it is installing two grid stations, one at Gharo and another at Jhimpir by installing two 220 KV double circuit transmission lines from Jhimpir to Gharo to transmit power from wind power projects.



Tariff Snags

The National Electric Power Regulatory Authority (NEPRA) has yet to announce the upfront tariff for wind power plants, as the last notified tariff in 2015, which was at Rs. 10.6 per kilo watt has already expired.

Once approved, the tariff for the wind power producer would remain for the 20 years from the date of commencement of commercial production.

Danish Iqbal, President of Pakistan Wind Energy Association said the main demand of his association is development of the infrastructure including new grid stations and timely announcement of the tariff. There is a lot of potential of renewable energy including wind power in Pakistan, he said, but still this potential is not tapped due to delays in decision making. Internationally wind power's share in the overall energy's installed capacity is 5 percent, but in Pakistan it is much less. Currently power generation through oil is around 45 percent of the total commercial energy supply, where as contribution of natural gas is 34 percent and hydel power remains roughly at 15 percent.

Danish Iqbal expects that the production capacity of installed wind power plants would touch 700 MWs within four months, which would be added to the National Grid. However, he said the new upfront tariffs needs to be announced without wasting any time.

Risks and potentials

Investors all over the world are very shy and sensitive to their profits. Usually, the returns from investments in wind power

sector are very uncertain and mostly dependent on the government policies, incentives given and the taxation structure imposed on businesses. Hence changes in either area remains a source of concern for the investors. In the wind energy, the power generation depends on the wind speed, which is under control of the Mother Nature. There is always a risk that the level of power generation may vary year-on-year basis and this fluctuation would affect the profitability of the operating company.

Adequate grid availability to evacuate the generated power is also a must, which may be made available before commissioning of any unit. Any risk of poor grid availability and reliability may have been borne by the investing company and in the current circumstances; no one is ready to take this risk.

The wind energy is infinitely sustainable form of energy, usually a wind power plant can last over 20 years. These plants do not need any fuel, so once installed only maintenance cost is incurred, which is negligible. The land acquired for the plant can be used for agriculture purpose, which can give extra incentive to the local population. This type of energy protects the environment and does not play its role in climate change. It does not produce any toxic or carbon emission, because it does not need any fuel, thus environment friendly. According to Met office estimates, each megawatt-hour of electricity that is generated by wind energy helps reduce 0.8 to 0.9 tons of greenhouse gas emissions that are produced by coal or diesel fuel generation each year. ■

By Javed Jabbar



CONSERVATION CONVERSATIONS

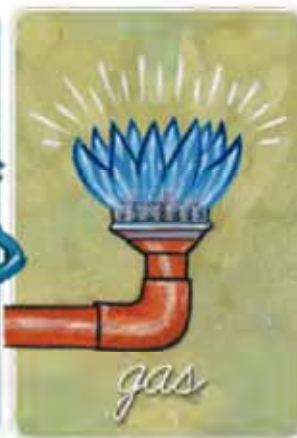
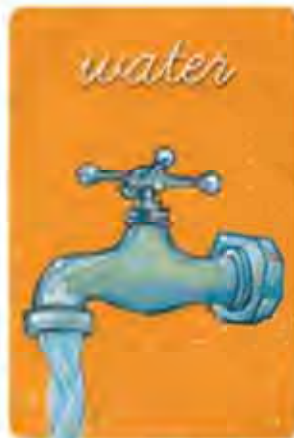
challenges of sheer logistics and management capacity as potential new Members in the two new categories could number several thousands. IUCN is the only global forum in which, in Category A, States/Government agencies/ official political and/or economic integration organizations and in category B, national and international NGOs are both Voting Members. In weightage terms, State votes inevitably count for more than NGO votes. But equity underlines this unrivalled combination of entities. Presently, there are 217 State/State-related Members and 1066 NGO Members. Over 16,000 scientists and specialists in virtually every aspect of Nature voluntarily contribute their research outcomes through six Commissions.

Established in Fountainbleau, France in 1948, IUCN is the world's oldest and largest environment organization. Over the past seven decades, it has evolved into a remarkable knowledge-based institution. Working collaboratively rather than conflictually, its Membership requires a consultative, consensus-building approach. Structures are exceptionally democratic yet also highly complex. They demand careful navigation of governance processes. The present President is Xinsheng Zhang, unanimously re-elected this year for second 4-year term. Supporting the volunteer-based Council and Commissions, there is a full-time Secretariat led by Director-General Inger Anderson of Denmark of

In September 2016, the world's most unique ecology forum adopted two Motions with potentially far-reaching, multiple impacts on mass participation to combat climate change.

After prior endorsement by electronic ballot of dozens of other pertinent Motions, adoption of these two came in the final days of the Members' Assembly of the International Union for Conservation of Nature (www.iucn.org) held as the second part of the quadrennial World Conservation Congress, Honolulu, Hawaii, USA, 1st-10th September. This was attended by over 9000 delegates from about 160 countries. Ten fulsome days enabled thousands of dialogues to enlighten, and to motivate action for a healthier planet.

One Motion approved opening Union membership to indigenous people's organizations. The second Motion called on the newly-elected Council to set up a Working Group on how membership could also be opened to Local Governments. While indigenous people's bodies are relatively easy to identify for eligibility, there are significant variations between, and



even within countries and across continents on the precise definition of eligible Local Governments.

When implemented, the new measures will further broaden, deepen, strengthen the worldwide movement emerging in recent years to promote ecological stability and achieve the 17 Sustainable Development Goals for 2030.

Both Motions pose formidable future

about 160 persons in Switzerland and over 1000 staff in offices across eleven regions.

Indigenous peoples who are traditionally close to Nature and best placed to confirm the worst impacts of climate change on livelihoods are already represented through existing Membership categories. For instance, even if indirectly so, by States represented, in turn, by credibly elected Governments as well as NGOs with grass-roots, communities-based mem-



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Int'l Wind Energy Summit 2016

Experts highlight potential and issues of alternative energy sector



The potential and issues concerning production of renewable energy in the country especially through wind power were discussed in detail as Energy Update

with its partners and sponsors once gathered a large number of experts and managers of national power sector under one roof in Karachi on 03 November, 2016.

The occasion this time was the moot titled "International Wind Energy Summit: Pakistan Wind Energy Industry-Prospects and Challenges" organized at a hotel by Energy Update in collaboration with World Wind Energy Association, Alternative Energy Development Board.

Speakers of the moot who are all renowned names of the energy sectors



Abid Sher Ali, Amjad Awan, Naheed Memon, Ishliq Balg, Sultan Farooq Khan, Naeem Qureshi, Dr. Faiz Ahmad Chaudhry, Sarim Sheikh, Dr. Kleineidam Lamhyer, Mumtaz Hussain, Imran Shafiq, Syed Imran Shah, Syed Mustafa Shah, Mahfooz Qazi, Hussain Agha, Engr. Nadeem Ashraf speaking at the Int'l Wind Energy Summit 2016



having extensive experience to handle power issues, urged the government to take alternative renewable energy sector of the country more seriously so that its issues could be sorted out and expected growth and output of the sector would be utilized as part of the national strategy to overcome years-long power crisis of the country.

At present installed capacity of wind power projects in Pakistan is 590 Megawatts, which will be increased to 1752 MWs in a coming few years to effectively harness vast source of clean and renewable energy of the country, which has remained largely untapped over last many years, said speakers of the moot.

They said that as compared to any other conventional source of power generation including coal-based electricity generation, on which the present government has been laying emphasis, international donor agencies had always been willing to support projects of alternative energy for their supposed several advantages for economy and society so the govt should do planning to avail such financing opportunity for growth of its energy sector facing serious shortage of fiscal resources.

State Minister for Water and Power Abid Sher Ali, being chief guest of the moot, said the present government was taking all possible measures to ensure energy security and sustainable development in the country as the govt in its bid to diversify its energy mix, had been giving attention towards fast track development of alternative/renewable energy resources in the country.

"In a short span of 10 years, Pakistan has started harnessing the immense potential of alternative and renewable energy resources available in the country," said



Naeem Qureshi Chairman Organizing Committee presenting Wind Energy Award 2016 to Abid Sher Ali, Minister for State for Water & Power

the State minister. At the moment there are 35 wind power projects having a cumulative capacity of 1752 MWs, which are at different stages of development and operation whereas 12 power projects of 590.5 MW cumulative capacity have achieved commercial operation and are supplying electricity to national grid, said the State minister.

"We firmly believe that in order to achieve sustainable energy growth through utilization of indigenous resource, clear road map and targets need to be defined with emphasis on utilization of environment friendly sources backed with right set of incentives and government support together with innovative financing mechanisms and creation of awareness amongst these masses," said Mr. Sher Ali.

He said the present government had been successfully striving for ensuring sustainability, reliability, and affordability of energy in the country and for this cause renewable sources of energy available in the country were being promoted.

Also speaking, Chief Executive Officer of Alternative Energy Development Board (AEDB) Amjad Ali Awan shed light on work done by AEDB to promote renewable energy sector of the country owing to which the country had been able to generate 1135 MWs through alternative modes of power production as wind-based energy had so been far major contributor towards clean energy production in the country.

He said that AEDB had been arranging finances through international donors for ensuring due expansion and upgrading of power transmission capacity of the country for connecting upcoming wind energy projects in Sindh to national grid for timely evacuation of clean electricity being produced in Thatta-Jhimpir wind corridor.

Wind Energy Awards 2016 Recipients

1. Mr. Abid Sher Ali
Minister for State for Water & Power
2. Ms. Naheed Memon
Chairperson - Sindh Board of Investment Government of Sindh
3. Mr. Amjad Awan
CEO- Alternate Energy Development Board (Govt. of Pakistan)
4. Mr. Sarim Sheikh,
President & CEO
GE Pakistan
5. Mr. Adil Khan
NORDEX PAKISTAN
6. Mr. Sultan Farooq Khan
Director - ME Consult (Pvt.) Ltd.
7. Mr. Mumtaz Hussain
ZORLU ENERJI PAKISTAN
8. Syed Asif Mahmood
Chairman Technomen
9. Mr. Imran Shafiq
Director of Sales (South Asia)
Vestas Pakistan (Pvt) Limited.
10. Mr. Asad Alam Khan
Chief Executive - Norinco
International Thatta Power
11. Mr. Syed Imran Shah
Engineering Manager
(Projects) at Fauji Fertilizer
Company Ltd.
12. Syed Mustafa Shah
Head Marketing EPC-Power
Descan Engineering Ltd.

He said that AEDB had done all the homework and groundwork to promote the system of "Net metering" to be adopted by distribution companies under duly made guidelines and technical assistance so that individual consumers were encouraged to install small units of solar panels or wind-mills at their households for their domestic



Wind Energy Awards 2016 winners



Amjad Awan, CEO AEDB



**Sarim Sheikh, President & CEO
GE Pakistan**



**Naheed Memon, Chairperson
Sindh Board of Investment**



**Adil Khan
NORDEX PAKISTAN**



**Sultan Farooq Khan
Director - ME Consult (Private) Ltd.**



**Mumtaz Hussain
ZORLU ENERJI PAKISTAN**



**Syed Imran Shah
Fauji Fertilizer Company Ltd**



**Asad Alam Khan
Noricon International Thatta Power**



**Imran Shafiq
Vestas Pakistan (Private) Limited.**



**Dr. Fayyaz Chaudhry
MD, NTDC**



**Mahfooz Qazi
Energy Dept. Govt. of Sindh**



**Syed Mustafa Shah
Descon Engineering Ltd.**

energy needs.

Sultan Farooq Khan, a consultant in energy sector, said that Pakistan was still in the infancy stage to explore the option of alternative energy as only five to ten per cent of total electricity needs of the country was being met through renewable sources of power generation. In contrast to Pakistan, Denmark has been producing 145 per cent of its electricity requirement through renewable sources as it has been exporting clean energy to other countries.

Muhammad Naeem Qureshi, Managing Editor of Energy Update and organizer of the event, said that more such moots would be organized by his forum to promote the cause of meeting energy shortfall through reliable, inexpensive, and environmental friendly means.

Dr. Faiz Ahmad Chaudhry, Managing Director of National Transmission and Dispatch Company said that wind power projects commissioned in the country under normal circumstances had been producing 30 per cent to 35 per cent of their installed capacity at any given time while solar power plants had been producing 15 per cent to 16 per cent of their capacity showing well that Pakistan had been meeting well international benchmarks for renewable energy production.

For instance, in the previous day 111 MWs electricity was being produced from the wind power projects having cumulative generation capacity of 584 MWs while 242 MWs power was being generated through solar-based plant having total capacity of 400 MWs, which was again an encouraging sign showing well the potential of renewable energy of the country was being ably utilized.

He was of the view that govt was supposed to lift ban on issuing of Letters of Intent (Lols) to new wind power projects in Sindh's wind corridor for such alternative power projects, which should get commissioned by year 2021 or 2022 owing to a



Ms. Ruqiyah Naeem presenting a memento to Abid Sher Ali on behalf of Energy Update. Engr. Nadeem Ashraf also seen in the picture

large number of power generation projects at present being developed in the country.

Rehan Ahmed, Chief Executive Officer of Sindh Transmission and Dispatch Company (STDC), said that Sindh had become first province to establish its own transmission and dispatch company in light of the 18th Constitutional Amendment as STDC had all the willingness to support development on prospective 35 wind power projects for which Lols had been issued by Sindh govt as their commissioning would add further 2735 MWs of clean energy to the country.

He said that STDC had up to 90 per



cent completed work on 95 kilometres long transmission line, which would be used for evacuation of power from 100 MWs gas-based power plant at Nooriabad being established by Sindh government.

Abid Latif Lodhi, CEO of Central Power Purchasing Agency Ltd, said that once renewable energy sector got development in the country, the existing "Competitive upfront mode" for tariff determination should be replaced with "Solicited site competitive bidding mode" so that such companies would be given contracts for doing wind based power projects, which could offer lowest tariff as compared to the benchmark tariff for wind energy to be determined by the power sector regulator. This would safeguard financial interests of power consumers in the country as they would be given renewable electricity on lowest feasible rates.

He said that foreign companies should be allowed to do projects of alternative energy in the country with compulsory condition of transfer of related technologies to be produced indigenously by the country as what India was doing to promote clean energy sector.

Later talking to newsmen, State Minister Abid Sher Ali said that recent change of ownership of privatized K-Electric would hopefully augur well for electricity needs of people of Karachi, which was economic and industrial hub of the country. He said the government could likely re-negotiate terms and conditions of handing over K-Electric to Shanghai Electric in large interests of power consumers in Karachi.

He said that previous private management of K-Electric, had failed to fulfil its contractual obligations and provisions of the implementation agreement it had signed with the govt. To a question, he said that the present govt was well on track to overcome electricity shortfall in the country by year 2018. ■



Abid Sher Ali visiting stall of Descon



View of Stalls at the Event

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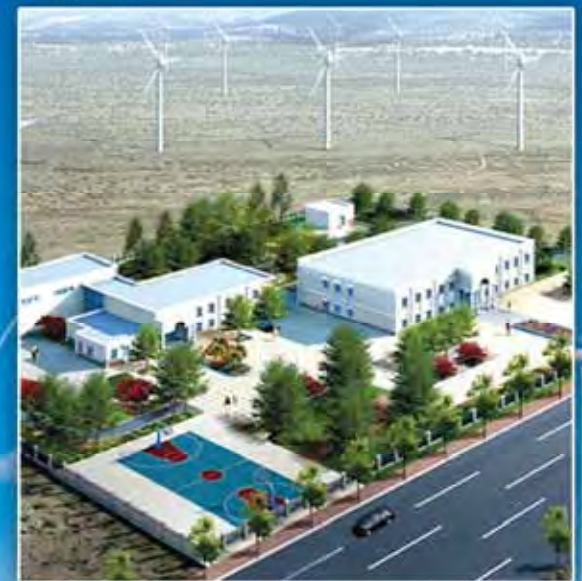
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Norinco enters Pakistan to develop power sector

Norinco International Thatta Power (PVT.) Limited, a private limited company incorporated under the laws of Pakistan, with it is established by Norinco International Corporation Ltd, a company incorporated under the laws of PRC, Beijing, PRC and AN Enregy (Pvt) Ltd.

The Company will enter into an implementation agreement and an energy purchase agreement with competent Pakistan government authorities for the Project and will construct, develop, finance, own, and operate the 100 WM Wind Power Project in Jhampir, Thatta, Sindh. Both two shareholders and management staff & members have rich experience in electrical industry not only-in Pakistan, but also in other countries.

NORINCO International is the business sector of NORINCO in its international economic and technical cooperation, and has become a public listed company on Shenzhen Stock Exchange in 2001. By years of successful management in the international market, NORINCO International has developed itself into an international engineering contractor with comprehensive capabilities in providing project survey and design, financing, procurement and supply, construction and operation as well as system integration. The typical electrical projects done by Norinco international is as follows:

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completed in 2009

TURKEY TEFEN Hydropower Project
Capacity of 33 MW,
completed in 2011

Thai PTA Thermal Power Plants
Capacity of 55 MW (1993-1996)

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Since its entry into African and Asian markets in 1997, NORINCO International has successfully completed many Power Transmission & Transformation projects. i.e. The Power Transmission & Transformation projects completed by NORINCO International in Ethiopia have scattered all over the country within 15 years.

Oversea Investment

Lao Nam Phay Hydropower Plant BOT
Capacity of 70MW (2014-2017)
Total investment: \$220 million.

NORINCO and China Railway signed the consortium agreement on the Lahore Orange Line Metro Project for Pakistan in Beijing and nowadays EPC work completed 60%.

Amjad A. Awan

Chief Executive Officer (CEO) -
Alternative Energy Development
Board (AEDB)



Amjad A. Awan is US-State Alumni and has recently been Hubert Humphrey Fellow at Massachusetts Institute of Technology (MIT) USA. In such capacity he has been affiliated with John F. Kennedy School of Government in Harvard University, USA. While progressing through his professional development activities in MIT and Harvard, he mainly specialized in the areas of 'Energy Policy' and 'Sustainable Development'. While being in USA, he has been formally appreciated by MIT and Harvard University in terms of his performance, skills and contributions. Upon successful graduation from MIT, Mr. Awan was recognized as "Exceptional Performer" and was accordingly acknowledged / honored by the US President, Barack Obama.

Mr. Awan has done his Bachelor of Engineering (B.E) - Electrical (1993) with Distinction as Position Holder (Academic Excellence Award) and later on did his Master in Business & Administration (MBA) from University of Lancaster (Lancaster University Management School- LUMS, United Kingdom -2005-06). (Triple accreditation of AACSB, AMA and EQUIS).

He enhanced his specialization in 'Economic of Energy' from University of Birmingham, UK (2009) through British Chevening Fellowship, where he has been associated with top notch management of energy sector and other sector stakeholders in government and private sector. Mr. Awan, with vast experience of twenty (20) years on various leadership positions worked in the diversified landscape of job functions and remained engaged at top policy levels, mainly in the power sector restructuring, regulation and associated public private partnership issues in energy and infrastructure development. ■

Abid Latif Lodhi

CEO, Central Power Purchasing
Agency (Guaranteed) Limited



Mr. Abid Latif Lodhi possesses diversified professional experience spanning over 27 years in power and water utilities sector concerning policy, regulation, strategic, corporate planning, corporate performance management, organizational capacity, enhancement (including process optimization and system automation), tariff development and financial modelling, at both local and international organizations. Commencing his role as CEO of CPPA-G in March-2016, he has initiated major processes for operationalization of CPPA-G as independent Market Operator, issuance of policy guidelines, Enterprise Resource Planning (ERP) for development of transparent mechanism (billing-collection-settlement-payment) among the market participants, demand forecasting, least cost generation, financial forecast and power purchase basket price, Human Resource Management (HRM) etc.

Quite recently, he has achieved notable benchmark of transferring CPPA-G's operations from Lahore to Islamabad. Mr. Abid Lodhi is a Management Accountant by Profession and has worked on different positions in power sector as mentioned hereunder: Team Lead Policy (Governance and Privatization) - USAID Power Distribution Program, Chief Financial Officer (CFO), Lahore Electric Supply Company (LESCO) Team Lead Financial Management, USAID Power Distribution Program, Finance Director, International Resource Group (IRG), Head/Specialist Tariff and Regulatory Affairs, Power & Water Utility Company (MARAFIQ), Saudi Arabia, etc. ■

Dr. Fiaz Ahmad Chaudhry

M.D., National Transmission
and Despatch Company
(NTDC)



Dr. Fiaz Ahmad Chaudhry has taken over the charge of Managing Director, National Transmission & Despatch Company Limited (NTDC) on 15 July 2016. Dr. Chaudhry was appointed by the NTDC Board of Directors with the concurrence of Government of Pakistan on June 30, 2016.

Dr. Fiaz Ahmad Chaudhry is an Electrical Engineer by profession with over 31 years of experience in Power Sector in National and International utility/consulting industry including WAPDA, SCECO-East, Acres International/Hatch Ltd. He possesses BSc, MSc and PhD degrees in Electrical Engineering from UET Lahore, IIT, Chicago, IL, USA and Purdue University, West Lafayette, IN, USA respectively. Besides, he attended many management and technical courses from renowned institutions like Strategic Management, Leadership, Project Management, Decision Making and Problem Solving, Managing employee's performance, Team Working and Multi-skilling, Middle Management Program, Total quality Management, Safety, etc. and many technical courses.

He also possesses profound experience in working with consultants, utility boards, government and International Funding Agencies for developing and implementing long-term power infrastructure projects. He managed projects around the globe including Canada, USA, Ghana, Guatemala, India, Indonesia, New Caledonia, Saudi Arabia, Tanzania, Uganda and Pakistan. ■

Saiyed Asif Mahmood

CO, Technomen Kinetics (Pvt.)
Ltd. & Chairman Advisory
Committee



Saiyed Asif Mahmood is the Chief of Operations of Technomen Kinetics (Pvt.) Ltd. and its various sister concerns and has 28 years experience to his credit in the disciplines of Engineering and Finance. He was also the first President of Anvil International, a Joint venture between a US and a Pakistani Company. During his years at Technomen, Saiyed Asif Mahmood has been involved, at the top level, with all major projects since his joining, where he has been responsible for Project Planning and their execution, he has also worked on Reliability and Maintainability assignment with Raytheon and NASA in the US. Saiyed Asif Mahmood has been the treasurer of Operations Research Society of America for a number of years and has taught Master Level courses on Engineering Management and Operations Research at Florida Tech. Mr. Mahmood has also been the Chairman of Engineering Decision Management (EDM), Inc. USA until its acquisition by Harris Corporation.

He did his Bachelor of Engineering from NED University and Technology, Karachi, Pakistan and then proceeded to US for a Masters in Operations Research and Engineering Management and another Masters in Mechanical Engineering. ■

Asad Alam Niazi

COO, Norinco International Thatta Power (Pvt) Ltd.



Mr Asad Alam Niazi IS Director and Chief Operating Officer of Norinco International Thatta Power (Pvt) Ltd. He also owns majority stake in Burshane LPG (Pakistan) Limited, a company incorporated in 1966 and is the pioneers of marketing LPG in Pakistan. Mr Asad Alam Niazi is the Director and CEO of Burshane LPG Pakistan Ltd. Burshane is the only LPG marketing company to be listed in the stock exchange. The Company markets LPG for use as an alternate fuel for use in domestic, industrial and auto sectors.

Mr Asad Alam Niazi also owns Burshane Petroleum (Pvt.) Ltd which is an Oil Storage Terminal at Kemari Port. This Oil terminal has a storage capacity of around 48,000 MT of DP (Oil and oil related items)

He is also the Director and CEO of Coal trading company which is named AAK COMMODITIES (PVT.) LIMITED. The Company is engaged in importing Coal from South Africa for multiple industrial segments in the Country. ■

Sarim Sheikh

President and CEO, GE Pakistan & Central Asia Region



Sarim Sheikh joined GE in 2012 as President & CEO of GE Pakistan. He is responsible for leading the company's operations and developing business growth strategy in the country.

He began his career at Shell, where he held a number of key leadership positions. Immediately prior to joining GE, he served as Country Chairman and CEO Shell Pakistan; from 2007-2011 he was Cluster General Manager for Shell Lubricants in the Netherlands, covering 55 countries in Europe, Africa and Latin America; from 2004-2007 he was responsible for Strategic Business Reviews and M&A projects with Shell Downstream Strategy; and from 2001-2004 he held the position of Global Marketing Manager for Shell Transport business in the UK, covering 140 countries.

Sarim is a member of the Managing Committee of the Overseas Investors Chamber of Commerce and Industry (OICCI). He holds an MBA degree from the London Business School. Based in Islamabad, Sarim is married with two children. ■



These small Wind Turbine Trees are a fantastic additional source of free electricity production that can work day and night, look beautiful, are not very expensive and do not take up much space. I'd love to have a few of these trees setup on my rooftop!!

Imran Shafiq

Country Director, Vestas Pakistan



Imran is a business strategist. He has severed different multinationals and big corporation over the last 18 years. During his career, he has been appointed in different prestigious positions.

He has successfully initiated, planned, established and led new business ventures in oil & gas and renewable energy sectors of Pakistan. Imran has broad experience in running projects from initiation to successful and timely completion.

He is skilled in creating and focusing organizations to achieve their strategic goals. Over the years, he has been a consistent performer with a proven track record of increasing revenues and profitability for different organizations. He has been involved in different acquisition and joint ventures. He has great knowledge and in-depth understanding of the interplay between contracts, operations and commercial outcomes.

Imran is working as Director Sales for South Asia and has also been appointed as the Country Head of Vestas Wind Technology Pakistan (Private) Limited. Imran has received his MBA degree for University of Wisconsin, USA and Mechanical Engineering degree from University of Engineering and Technology, Lahore, Pakistan. ■

Syed Imran Shah

Engineering Manager (Projects) at Fauji Fertilizer Company Limited



Syed Imran Shah is the Project Manager of FFC Energy Ltd., a subsidiary of Fauji Fertilizer Company Ltd. He led the Project Team to construct & commission Pakistan's first and signature grid connected wind farm. Since wind energy technology is nascent in Pakistan, he not only developed project for FFC but also assisted Government functions and UNDP/GEF in developing projects at National level. He had presented papers on Wind Energy Technology at different seminars conducted by IEEE, UNDP, AEDB, USAID, UNGC, NTDC, Energy Update, Shamrock & POGEE. He had also conducted short courses on Renewable Energy Technologies and Clean Development Mechanism to Senior Officers at WAPDA Staff College Islamabad and Jamshoro. He is also a writer on renewable technologies in leading newspaper in Pakistan.

A graduate of NED University in Mechanical Engineering and MBA in Finance. He has 25 years' experience of Project Management, Project Engineering and Plant Maintenance. He is lead assessor of integrated management systems of Quality, Health, Safety and Environment. He has traveled extensively for different projects and aware of working with diversified cultures, communities and multinational teams. ■

Dr. Ing. Patric Kleineidam

Head of Department, Wind Energy
Lahmeyer International GmbH,
Germany



LAHMEYER INTERNATIONAL GMBH, Bad Vilbel, Germany, Head of Department "Wind Energy". Civil engineer specialised in support structures of on- and offshore wind energy converters and project engineering and management.

Project Engineering: Technical due diligence of wind park projects including assessment of energy yield and long term predictions as well as estimation of M&R costs

Engineering experiences in civil engineering certifications for support structures of wind energy converters like towers and foundations, supervision of civil works.

Project management and research engineering on different aspects of the design of support structures of offshore wind energy converters; structural calculation in time and frequency domain; development of software tools for these calculations; FE-calculations for structural details with ANSYS®.

Additional knowledge in economics (degree as industrial engineer). ■

Sultan Farooq

Managing Partner
MEConsult (Pvt.) Ltd.



Mr. Khan has a Degree in Mechanical Engineering and an MBA in Finance. Mr Khan is Managing Partner of MEConsult (Private) Limited and has more than forty years of experience in management and execution of complex infrastructure projects both within Pakistan and abroad..

The Consulting experience covers successful implementation of energy and infrastructure projects in France, Germany, Holland, Africa and the United States of America. As a Consultant to Alternative Energy Development Board (2006-2007) Mr. Khan pioneered the structuring of Security Documents (Energy Purchase Agreement, Implementation Agreement, Land Lease documents etc.). These Agreements are the foundation of RE Contracts in Pakistan and have catalysed investments in Renewable Energy. ■

Hussain Agha

Executive Director, Agha Steel
Industries



Mr. Hussain Agha is playing a pivotal role in transforming Pakistan's Steel Industry by spearheading Agha Steel Industries to becoming the leading Steel Manufacturer of the nation.

Hussain Agha attended Bentley University, which is ranked amongst the top 15 Business Schools in North America. He excelled to complete his undergraduate degree with a Bachelors of Management, ranking in the top 10 percentile in his graduating class. Further pursuing to complete his MBA, he graduated with Honors from McCallum Graduate School of Business at Bentley University. After attaining an exceptional education, the focus grew towards attaining the knowledge of Steel Making with an aim to redefine the Steel Industry of Pakistan.

In addition of various recognitions and awards, Mr. Agha has also received the Best Performing CEO award at the occasion of 13th CEO Summit Asia by Governor Sindh, Dr. Ishrat-ul-Ebad.

The innovative ideas of Mr. Hussain Agha, such as focusing on Quality products by manufacturing through an Electric Arc Furnace, coupled with the passion for Steel Making allowed the group to effectively launch the largest Steel project of the decade in the private sector of Pakistan in a record-breaking time of only 14.5 months from inception. Mr. Hussain Agha's management skills and technical knowledge of Steel Making has enabled the Group to effectively expand and penetrate Pakistan's infrastructural development by providing quality steel rebar's and wire rods to many key development projects. ■



For the cost of an iPhone, you can now buy a wind turbine that can power an entire house for lifetime

Avant Garde Innovations, the startup founded by siblings Arun and Anoop George from Kerala, has come up with a low-cost wind turbine that can generate enough electricity to power an entire house for a lifetime. The size of a ceiling fan, this wind turbine can generate 5 kWh/kW per day - with just a one-time cost of US\$750.

"Our goal is to eliminate energy poverty, reduce dependence on struggling state power grids and create energy self-sufficiency for all the needy ones through distributed, localised and affordable renewable energy. In doing so, we believe we can collectively usher in our world a cleaner environment, new economic prosperity and social change," reads the company 'What We Do' statement.

"Our first offering is a highly affordable small wind turbine suitable for residential, commercial, agricultural, village electrification and other uses, which is aimed for a market launch during 2016." Incorporated in 2015, Avant Garde claims to be a startup with a 'green' heart and soul. ■



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Descon Engineering Limited & Wind Sector in Pakistan



Descon Engineering Limited being the largest engineering manufacturer and construction contractor in Pakistan from the onset was one of the pioneers in nurturing the Wind industry. In 2009 Pakistan Descon and European WTG manufacturer joined hands to provide complete EPC and O&M solutions for the 50 MW Wind Power Projects

which were to supply the power generated to the National Grid network of Pakistan.

This consortium helped the wind sector by imparting valuable trainings to the different stakeholders in the wind industry, development of the initial energy purchase agreements, guidelines for testing of the wind turbine power plants as IPP's. Development of O&M teams was a key milestone which helped in the indigenization of the skills. This was a road map for the other investors to follow.

In 2010 the first commercial-scale Wind IPP of Pakistan FFCEL was commissioned which put Pakistan on the World Renewable Map.

In 2014 the largest land based turbines of 2.5MW with a rotor span of 100 m were installed for 50 MW FFWE II project and commissioned this was another milestone in the nascent history of Wind Power in Pakistan.

Till date Descon has executed 300 MW projects, all of them are operational. We are proud that all the 300 MW of projects have achieved COD with smooth Reliability Run Test (RRT) in the first attempt.

Descon has diversified experience in providing one stop solution for power projects including Wind and has established itself as the preferred contractor for clients.

Descon can provide a turnkey solution based on:

- Manpower base of 16,000 including 400 design engineers, knowledge of engineering design and installation to handle the challenges of an EPC project under single point responsibility.
- 5 manufacturing & fabrication facilities in the region.
- Strategic partnerships and vendor relations with Chinese and European companies for Wind turbine.
- Manufactured no. 133 Tubular Wind Towers (height: 80 m) at state of art tower manufacturing facility in Karachi certified by TUV Nord.
- Operation and Maintenance of all projects for 10 years scope.
- Large crane and transport capability with fleet of 120 cranes available. Thus, successfully installed 1.5 and 2.5 MW wind turbines.
- Market leader in O&M of wind power -150 MW in execution and signed contracts for further 150 MW. O&M teams present in both significant wind corridors of Pakistan - Jhampir and Gharo
- 300 Key O&M staff managing 1180 MW of Thermal, Wind and Biomass Power Plants

Major successes in the wind sector power plant include:

- EPC Contract for 50 MW FFCEL (1.5MW x 33), Jhampir
- EPC Contract for 50 MW FFWE II (2.5 x 20), Gharo
- EPC Contract for 50 MW FFWE I (2.5 x 20), Gharo
- EPC Contract for 50 MW Metro (2.5 x 20), Jhampir
- EPC Contract for 50 MW Younus (2.5 x 20), Jhampir
- EPC Contract for 50 MW Gul Ahmed (2.5 x 20), Jhampir
- Construction Contract for 50 MW Hydrochina Dawood Wind Power (1.5 X 33), Gharo. ■

China invests \$ 115 million to develop wind energy in Pakistan

China is helping Pakistan build a wind power plant near its southern port city of Karachi with a total investment of \$115 million, according to HydroChina Investment Corporation, which invested in the plant. The Dawood wind power plant, located some 60 kilometers east of Karachi, is expected to generate 130 million kilowatt-hours of electricity per year, meeting the need of about 100,000 families in the local area.

Jiang Li, secretary of the corporation, told People's Daily that the plant's capacity is 49.5 MW. Its construction started in April of this year and is expected to be completed in June 2016 and start to generate power three months later. According to Yang Zhiyao, Manager of the Dawood Power Plant Project, the plant can be operated for 20 years after its completion. He said that all the investment will be recouped after eight years of operation.

Yang added that wind power plants usually can be built very fast and thus are very effective in relieving the shortage of power in local areas. A Pakistan wind farm built and funded by the China Three Gorges Corporation is generating more than one-million kilowatt-hours of electricity everyday. The project is operating for more than 20 hours a day, a spokesperson for the Chinese state-owned renewable energy giant said. Since it went into



operation in November, the facility has generated around 93-million kilowatt-hours, he added.

With an installed capacity of 49.5 megawatts, this is the first China-backed wind farm in Pakistan. It is an example of the work the two countries are doing to build the China-Pakistan Economic Corridor, part of the broader Belt and Road regional trade and infrastructure network.

According to another Chinese media report, Pakistan and China have signed many deals to help lift Pakistan out of its economic slumber and boost growth for the Chinese economy. China and Pakistan have signed many deals to lift Pakistan out of its economic slumber and boost growth for the Chinese economy. Besides funding dams to increase hydro power generation, it has already committed to build two 1100 mw nuclear power reactors in Karachi with USD 6.5 billion assistance.

China earlier assisted Pakistan in building four nuclear power plants, two with 300 mw capacity and two others of 320 mw capacity. China is also building 900 mw solar power project in Bahawalpur in Punjab on a 500 acre land. The projects were all stated to be part of USD 46 billion China-Pak Corridor finalised during Chinese President Xi Jinping's visit to Pakistan in April this year. ■

The Nordex Group: Wind Turbines For All Geographical Regions Across The Globe

Listed on the Frankfurt stock exchange Tec DAX (ISIN: DE000A0D6554) Nordex SE is the management holding company with its headquarters in Rostock; the board and administration based in Hamburg. The company boasts factories in Germany, Spain, Brazil, USA, and soon, India. The group produces its own nacelles, rotor blades and concrete towers, covering the whole technical value-added chain with its products and services, from identification of suitable sites, to system planning and technical implementation of wind farms. The company ensures clean sailing besides providing EPC work to its customers. It also offers a customised service for all of its wind turbines, which ensures the hassle-free operation of the machines on a worldwide scale. The average availability of all turbines covered by its Service stands at 98%.

The group has installed more than 20,700 MW worldwide and has offices and subsidiaries in more than 25 countries around the world with a total global headcount of over 5,000 employees.

Nordex combines decades of experience in designing, constructing and operating wind turbines, delivering more than 20 GW of sustainable energy worldwide.

With the serially-produced multi-megawatt wind turbines of Generation Gamma Nordex N90/2500, N100/2500 and N117/2400, Nordex is able to offer high-efficiency turbines for onshore use. Since 2013, Nordex offers the Delta Generation with the N100/3300, the N117/3000, and the N131/3000 for strong, medium and light wind sites.

For moderate-wind sites, Nordex has launched the N117/3600 with installed capacity of 3.6 MW, giving the turbine a 20% higher-rated output than the N117/3000. For light-wind sites, Nordex now offers the N131/3600 with installed capacity of 3.6



MW, also raising the rated output by 20%, meaning customers can produce up to a 12% higher yield. The sound emissions of the N131/3600 are limited to a max. 106.4 dB(A). At 105 dB(A), the N117/3600 has the same sound emissions as the N117/3000. Nordex offers both machines with serrations, which reduce the sound emissions by an additional 1.5 dB(A) in each case.

In April 2016, Nordex merged with Acciona Windpower and now also offers the brand turbines from Acciona Windpower, which have operated successfully in a variety of climates and markets across the globe. From initial designs in 1999 to a complete product line today, ranging from 1.5 MW to 3 MW, with multiple rotor and tower combinations, a robust experience base is reflected in growth of sales and proven product evolutions. Joining hands with Acciona the AW3000 wind turbine is an evolution and upscaled version of the successful AW1500. With double the power rating and a range of rotor options and tower heights, the AW3000 is an optimal choice to minimize cost of energy for any project. The latest evolution is the AW132/3000 for low wind sites, which provides the best capacity factor of any wind turbine in its class. Based on a scaled design of our successful AW1500, the AW3000 provides more energy capture per wind turbine location. Track record of wind turbine performance includes global average availability over 98% and extremely low failure rates of major components. ■

GE: Imagination at work

GE (NYSE:GE) is the world's Digital Industrial Company, transforming industry with software-defined machines and solutions that are connected, responsive and predictive. GE is organized around a global exchange of knowledge, the "GE Store," through which each business shares and accesses the same technology, markets, structure and intellect. Each invention further fuels innovation and application across our industrial sectors. With people, services, technology and scale, GE delivers better outcomes for customers by speaking the language of industry.



Today, GE-built technologies generate up to 25% of Pakistan's electricity, GE and GE joint venture engines power more than 60% of the aircraft operated by Pakistani commercial carriers, GE medical devices are installed in up to 70% of large hospitals across the country and GE's operations create employment opportunities for almost 450 Pakistanis. Our main businesses in Pakistan include Aviation, Energy Connections, Healthcare, Lighting, Oil & Gas, Power, Renewable Energy and Transportation. ■

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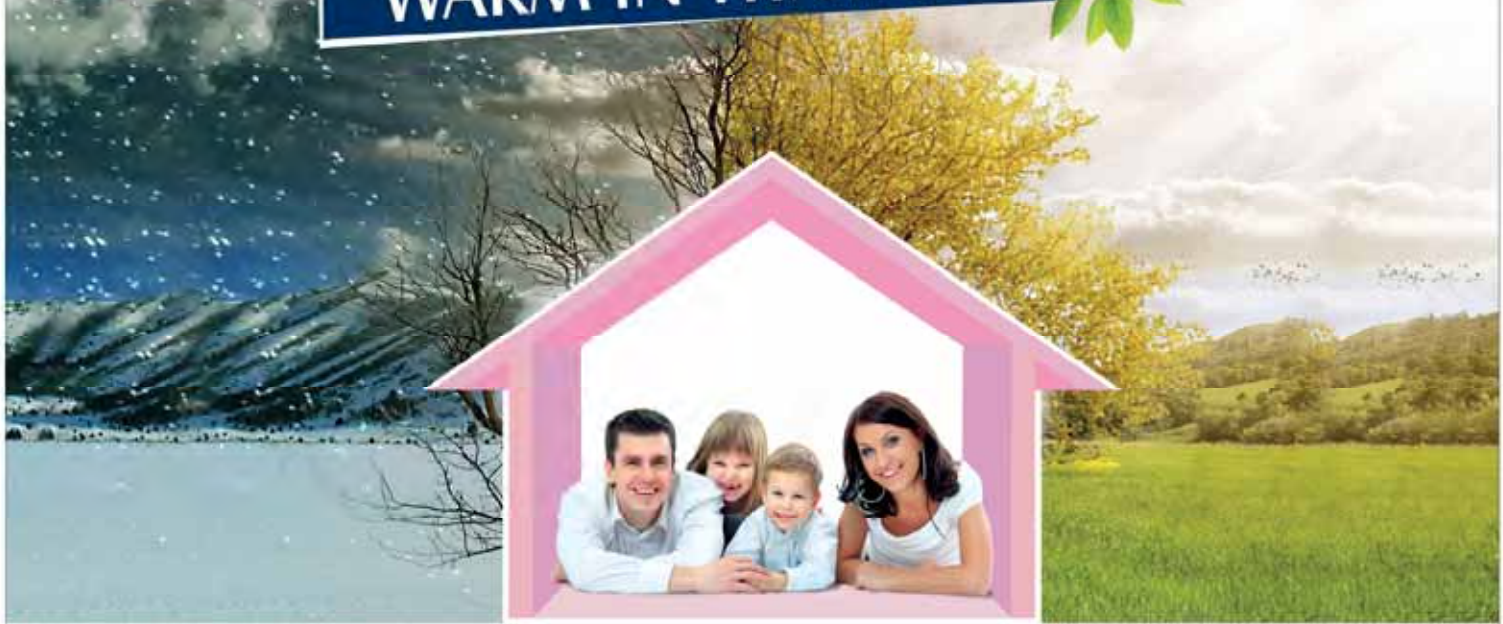
Formation of Company: 1993. TECHNOMEN is a multi-discipline industrial EPC organization which has been involved in various phases of the oil & gas sector, Power, Petrochemical and Electrical substation projects implementation from development/ planning to design engineering, execution, start-up and commissioning.



TECHNOMEN is owner/operator of 100 MW Gas fired combined cycle Power Plant (IPP)

TECHNOMEN has been involved in construction of most of major power, petrochemicals, Electrical Infrastructure, petroleum refining, storage terminals, pipeline and gas processing projects i.e 160 MW Attock Gen power plant, 108 MW Kamoki Power Project, 100 MW Nooriabad power project, Dhan poly-condensation plant, Dewan polycondensation Plant, NOVATEX poly-condensation Plant, ICI poly-condensation, RUPALI poly-condensation, Pindori LPG and gas processing plant, Turk Gas compression and processing plant, Bukhari gas compression and process plant, 132 Kv grid station at Attock Gen. 132 Kv Grid station at Kamoki power, 132 Kv grid station at Nooriabad Power project, 11 Kv substations at different places, 11 Kv and 440 v electrical distribution networks at different locations and many other valued projects. ■

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By Khaleeq Kiani

Power regulator in power struggle

Following in the footsteps of some businesses by embroiling regulators into litigation in order to forestall penalties and losses, the government is challenging the decision of the power regulator to block the revenues flowing out of utility companies to the consumers.

In the intervening period, the government is seriously working to reduce the National Electric Power Regulatory Authority (Nepra) into a subservient body of the ministry of water and power. This is being envisaged through an amendment in the law to follow government instructions in its determination.

A summary for the Council of Common Interest (CCI) has been moved which is unlikely to be cleared by the provinces because they had previously blocked a similar move during the PPP government.

The Nepra comprises four members, nominated one each by the provinces, and a chairman appointed by the federal government through a competitive process, to balance the interest of the consumers, the government and private investors.

Various business groups like cement, banks, telecom companies, fertilisers, textiles and poultry etc had previously blocked penalties imposed by the Competition Commission of Pakistan through court stay orders. Some of these cases initiated many years ago are still far from a conclusion.

It was, however, a rare move when the government-owned power distribution companies approached the Islamabad High Court a few weeks ago, seeking a stay order against tariff determinations issued by the power regulator, that entailed a Rs2-3 per unit (kwh) reduction in average tariff, involving a total amount of Rs227bn. The court issued the stay orders.

These utilities adopted the judicial route after exhausting all avenues (seeking review and reconsideration applications) available in the Nepra law, but failing to convince the regulator to pass on, to the paying consumers, the higher impact of system losses, inefficiencies and theft.

Under the Nepra law, the government is required to seek review of tariff determination based on any fresh ground, or in case a critical element is missed out by the regulator within 15 days, or else notify the tariff. After the Nepra rejected review and reconsideration petitions, the government, instead of notifying the tariff for fiscal year 2015-16, adopted to take the route of the Islamabad High Court.

On the basis of various benchmarks set



many years ago in consultation with the power companies, the Nepra determination entailed a yearly relief of Rs105 on account of the fuel cost of power generation and about Rs123bn on account of less recovery, theft and losses. This meant the paying consumers have been denied a monthly relief of about Rs19bn.

In fact not only the Nepra law but a series of Supreme Court judgements had limited the scope of the power regulator to follow the government objectives of keeping the tariff on the higher side. In the famous case of Rental Power Plants, the apex court had ordered that the regulator was not bound to follow government instructions against the law and it should pass on only fair and prudent costs of electricity to the consumers.

The crux of the judgement was that consumers paying their bills should not be made to bear the burden of those who do not pay, theft, or inefficiencies, because it was the responsibility of the power companies to ensure full recoveries and control theft and losses.

The government prepared a template case for all the distribution companies and has contended, before the high court, that it was following a uniform tariff regime across the country despite ten different tariffs being determined by Nepra for ten different Discos, in order to cater to the socio-economic necessities of the country and to have access to affordable energy for the purposes of economic growth and development.

The government also contended that Nepra's tariff determinations were a mere recommendation because it was the government that had to notify the tariff of the most efficient power company for all consumers, and on the basis of that provide subsidy to other inefficient companies to keep the tariff uniform.

"If the revenue stream of the Discos is not so supplemented by subsidy, it will adversely impact the ability of the Discos to fulfil their liabilities towards power sector entities and power generation companies - which in turn will lead to increased power outages and load-shedding - since a financial shortfall in the sector will impact the entire power sector's physical infrastructure, from generation to transmission to distribution", the government maintains.

The Nepra held that the burden of non-paying consumers, beyond a certain level, could not be passed on to the paying consumers, therefore, the margin for non-recoveries in the tariff could not be allowed or else it would be in violation of the Supreme Court orders.

In yet another case, the government is in the process of challenging, in the court, the Nepra's determination of tariff for the controversial Nandipur power project after the regulator repeatedly rejected requests by the ministry of water and power, and the generation company concerned, to increase its tariff by 34pc.

Here too, the ministry had exhausted all institutional and regulatory instruments to secure Nandipur's tariff on 'actual cost' after the regulator turned down review and reconsideration requests.

Nepra did not accede to the government request to approve the 'total actual cost' of the 425-525MW Nandipur project at Rs65bn, that would have increased Nandipur's average 30-year tariff at Rs15.63 per unit against Rs11.64 per unit determined by Nepra, on the basis of Rs42bn as 'prudent cost'.

The power regulator has written, time and again, that it had allowed all prudent costs in the tariff, and that consumers could not be punished for the omissions or commissions of the project authorities.

Similarly, there was no precedent to allow for the cost of a gas pipeline in the power tariff because the pipeline should be constructed by the gas company, treated as the gas company's asset and made part of the gas company's revenue requirement. ■

courtesy: Daily Dawn

Pakistan at a crossroads of its energy decisions

Our energy decisions of today will either please us or haunt us for the next 30 - 40 years

After decades of darkness due to the sheer gap between supply & demand of our country's power needs, a ray of hope emerges in the hearts of the people of Pakistan, mainly due to extensive, if not uncontrolled, progress on energy and power projects in the country. Multiple large scale projects, which were either buried in files or facing serious challenges in coming into reality, suddenly came out of their chrysalis and started spreading their wings. These include breakthroughs such as LNG terminals and pipelines, imported gas lines, Thar coal mining & power projects, CASA 1000, multiple hydel projects, large thermal power projects based on coal, nuclear and RLNG, and last but not the least, scores of wind & solar power projects.

Some of these projects got more attention and support from the government to such an extent that it resulted in raising eyebrows due to their preferential, if not biased, treatment, as compared to other energy & power projects. Despite these anomalies in providing a level playing field for all power technologies in proving their mettle, the approach and perseverance of the government in resolving this energy crisis is commendable.

However, there is a need to hold for a while and review the existing roller coaster ride of power projects to check the prudence and enduring impacts of our energy decisions on our economy, society and environment, the three pillars of sustainability. This is important, as the world is facing some of the worst existential level challenges linked with the decisions being taken in the energy arena globally.

World perspective of energy is very simple; we are growing in number at a fast rate. In the next 20 years, we will be adding 1.7 billion more energy users on the face of the Earth. However, this increase in population has another view, which is that our population is increasing more in our urban areas than our rural areas. In fact, it is decreasing in our rural areas during these years.

This represents a fast paced urbanization which has fast paced energy needs. A city dweller has much more energy requirements than his counterpart from a rustic area.

facing a growing population issue, but at the same time, fast paced urbanization as well. This, coupled with the developing economy, improving living standards and across the board energy inefficiency, creates a never ending energy thirst, which often results in knee-jerk reactionary decisions by governments in overcoming power shortage situations. Instead of following a fully deliberated energy plan and an apt energy and power mix, governments take hasty decisions commonly known as fire-fighting. For example, at one time in our not-too-far-away history (1985), our energy mix was 67% hydel and 33% thermal. Instead of maintaining this cost effective energy mix as it suits Pakistan the most in the competitive environment, we actually reversed it through hasty and immature decisions of our governments. The oil based IPPs which came through the 1994 & 2002 policies made a huge dent in our economy. Years after their commencement, these plants are among the last ones in the economic dispatch order. Each and every fossil fuel price shock



Table - 1 (2022 - 53,400 MW)

Power Technology	MOWP Recommended MW (%)	Recommended MW (%)
Hydel	19,200 (36%)	18,690 (35%)
Furnace Oil	5,900 (11%)	5,340 (10%)
RLNG	5,350 (10%)	3,738 (7%)
Nuclear	5,350 (10%)	5,340 (10%)
Imported Coal	4,800 (9%)	1,602 (3%)
Local Natural Gas	3,700 (7%)	3,738 (7%)
Local Coal	4,300 (8%)	4,272 (8%)
RE (Wind + Solar + Biomass)	4,800 (9%)	10,680 (20%)

almost broke our spine. Had we maintained our energy mix on the basis of our indigenous resources and reduced our dependency on costly imported fuels, our economy would have been in a much better state now. Unfortunately we have not learned anything from the past, our focus is still on imported fuels, and even now, we have opened a new chapter of imported electricity on a mass scale.

On the contrary, the world has been dissociating itself from using oil as a primary energy source from the year 1973, when the West faced an oil crisis due to an oil embargo from the Gulf countries. Similarly, the share of coal as a primary energy source is also on a decreasing trend, mainly due to its emissions and huge water consumption. Now, the deficit created by these two primary sources of energy has partially been filled up by natural gas, primarily due to its relatively clean nature, abundance and easier supply chain mechanisms. However, the deficit of oil & coal is so large that natural gas alone cannot entirely compensate for it. The world first resorted to nuclear power technology, and it grew like anything during the late 60s, 70s and the early 80s. Due to the incidents of 3 Mile Island (1979) and Chernobyl (1986), the world put bridles to this technology, seriously looking for a better option. This search accelerated after the Fukushima Daiichi incident in Japan in 2011 as a result of a massive earthquake followed by a horrendous tsunami.

Therefore, the expectation that nuclear power technology can fulfill the gap created by declining oil & coal shares was not realized. This gave birth to the rise of Renewable Energy (RE) power technologies. Wind, solar, mini & micro hydel, geothermal, biomass technologies were invented, developed and perfected not only to fill this gap but also to push other technologies back and claim a bigger share in the amalgam of world primary energy sources. In

Whether for trade, investment or technology, the bias remains towards the West and Japan. And thus far, unlike the West, China is far from a serious destination for Pakistan's exports. If the same question is posed to our generation, then the answer is again one of limited economic impact.

the last 20 years, no other power technology grew as much as wind & solar, and the global quest for RE is not fading in the next 20 years as well. It is expected that RE power technologies will quadruple from the current level by 2035, which forms one third of the total power growth. Current

global RE penetration level of 3% will be enhanced to 16% by 2035 and that is enormous. Many countries at that time will achieve above 50% RE penetration and some may cross 80%. Wind power capacity has doubled itself 4 times in the last 15 years, whereas solar has doubled itself 7 times in the same time period. China has installed 30 GW from wind power only last year, which is a lot more than what Pakistan has installed in the past 69 years, counting all power technologies.

The world's decision to go green has multiple bases focusing on sustainability (remember the three pillars: society, economy, environment), to cut the emissions in order to avoid climate-change-related disasters, avoiding deteriorating air & water quality, shielding economies from fossil fuel price shocks, and saving water for food and people. Moreover, RE power technologies do not require multi-billion dollar supply chains involving port terminals, jetties, pipelines, FSRLs, railway sidings and unending transport lines of ships, trains and trucks. These supply chains are not only super heavy on the economy and environment but they are also encroaching & deteriorating the infrastructures meant for other users such as roads & railway tracks.

Because of technological advancement, RE technologies are swiftly becoming the cheapest source of power. Countries rich in fossil fuels are also actively pursuing these power technologies. A recent example can be quoted from Dubai, where large solar power projects, each of hundreds of megawatt capacity, are planned at an incredibly low tariff. Saudi Arabia, the quintessential petro-state, is also following suit with similar, even bigger plans. The last auction of PV solar power project at Dubai drew the bid at 2.99 cents per kWh, at Mexico 3.6 cents per kWh, at Chile 2.91 cents per kWh, and at Abu Dhabi 2.42 cents per kWh, which is only possible due to economy of scale, excellent resource,

Table - 2 (2030 - 100,000 MW)

Power Technology	Recommended MW (%)
Hydel	35,000 (35%)
Furnace Oil	3,000 (3%)
RLNG	4,000 (4%)
Nuclear	11,000 (11%)
Local gas	3,000 (3%)
Local Coal	15,000 (15%)
Imported Coal	6,000 (6%)
RE (Wind + Solar + Biomass + Micro / Mini hydel + Geothermal)	23,000 (23%)

bers . But organizations specifically created for indigenous peoples have proliferated in recent decades to specifically preserve historic identities and linkages with land and natural resources because the composition of State entities and even NGOs is often diluted and diffused by diverse interest-groups .

Authentic representation of indigenous peoples is generally deficient . The bulldozing aggression of urban-driven capitalism and free-market economics embraced by most States and implemented by corporations

is a major reason .With rapid demographic shifts , transfer of controls , industrialisation and globalisation , destruction of historic habitats , gross reduction in species numbers , illegal wild life trafficking , or outright extinctions of species , original proprietaries and rights have been sharply eroded . Electoral systems transplanted from Westminster or Washington DC have often been unable to protect the devastation of Nature and

ensure fair representation . Crucial Congress decisions also included new priority attention to facets of urban ecology.

Long-standing demands for Union Membership of Local Governments have a symbiotic relationship with people's initiatives . State and elected Government structures have inherently centralising tendencies . They converge power narrowly at the expense of broader participative streams . Even after devolution , there are strong differences between how central

governments , and provincial or local governments view important environmental issues such as mineral resource development , fishing rights , land utilisation policies , provision of basic services such as water , et al . Existing Membership of States and Provincial Governments in IUCN is deemed by many as being inadequately , inaccurately reflective of ground realities.

The first part of the event comprised the Forum . This offered a feast of new knowledge on the status of hundreds of endangered species and eco-systems and on options for corrective action . At aesthetic , well -equipped Pavilions , in over 1000 inter-active workshops , sessions , screenings , expositions , the first 5 days were like compressing 5-year studies into a compressed , exhilarating crash course . From noting how Hawaii hosts the highest number of endangered species in any US state --- over 480 --- to realising that , even with continued poaching and illegal hunting , the numbers of elephants in parts of South Africa have increased due to effective conservation measures .

From the still vastly unexplored mysteries of the oceans and the lawless high seas , to observing the winged emperor of the winds , the great albatross , here was environmental education , and re-education , in vibrant action . A Business and Biodiversity segment aimed to make the corporate sector realise it's enormous obligations.

With over 50 delegates representing State entities , NGOs and Commissions , Pakistan rendered a reasonably prominent

, purposeful role . Park conservator Ashiq Ahmed Khan became the first South Asian to receive the prestigious Kenton Miller award for services in Khunjerab National Park . Malik Amin Aslam , who completed his first term as Vice President and Regional Councillor was re-elected for a second term 2016-2020 , and ably conducted a crucial session . Indus Earth Trust's Motion calling for the Government of Pakistan to declare Astola Island a marine protected area was endorsed . State and NGO Members contributed to discussions and shared their experiences . Federal Secretaries of Climate Change and Planning & Development also participated . Lt.General(r) Tariq Wasim Ghazi reported on how senior retired South Asian military officers strive to sensitize respective armed forces on their conservation responsibilities , be these in Siachin or in sea zones . Aban Marker-Kabraji continues to competently serve as Asia director for the Union's largest region . This writer served on the Congress Governance Committee and hosted the workshop on the struggle to save the critically endangered vultures of Pakistan and South Asia .

Shaped by the theme : " Planet at the cross-roads " , the 2016 Congress is likely to become a landmark in the struggle to empower people and processes for environmental security . ■

(The writer served in a volunteer capacity as elected global Vice President of IUCN for two terms, 2004-2012.

Hilarious things that happen on your first day at work

The first day at a new job is always terrifying! New faces and a totally different environment are bound to freak newcomers out! Clumsy introductions and embarrassing situations are a mandatory part of the first day. Such hilarious things just make it so much worse. We bet everyone can relate to extremely comical first-day-at-work moments!



So you try memorising every detail of every place so you don't get lost.

INTRODUCING YOURSELF

Introductions are the worst, especially when you know that nobody cares about anything other than your name.

REMEMBERING NAMES

The awkward moment when your coworkers introduce themselves and you forget all of their names in 0.5 seconds!

WHEN YOU'RE BEING ASSIGNED WHAT TO DO

When your boss is giving you tasks to do and you are trying to look like you

understand but on the inside, you're breaking down!

BEING A LONER AT THE LUNCH TABLE

Lunch is exactly like it was in high-school; terrifying. So you just stand there hoping somebody offers you a place and try not to make a face every time you get a whiff of the cafeteria food.

TALKING THE TALK

When you've finally found a place to sit amongst your coworkers but you fail to keep up with the conversation. Everything that they're saying just goes in one ear and comes out the other.

TRYING TO FIND THE TOILET

When you've finally prolonged the need to go to the toilet because you feel too awkward to ask. So you prepare yourself for the impending doom of getting lost. ■

ARRIVING EARLY

You don't want to be late for your first day of work because you don't want to look unprofessional. So you end up arriving early always.

HAVING NO IDEA WHERE TO GO

You constantly panic because you still have to get the hang of where things are.

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CPEC employment opportunity:

The ambitious project extends full opportunity of Pak market access to Chinese companies

The projects under China-Pakistan Economic Corridor (CPEC) is set to create more employment and growth opportunities for China, as it would give Chinese enterprises a market of some 200 million of Pakistani people. Though CPEC is meant for economic prosperity but seemingly not much people have so far been employed from Pakistan as we expected.

Over 16 projects have been selected in the energy sector to be implemented in the first phase, which can generate 10.4 million kilowatts of electricity. Moreover, a solar power plant in the city of Bahawalpur built by Chinese company ZTE Energy has installed a 300MW generator unit, which can produce enough electricity for the daily power consumption of at least 200,000 Pakistani families, said the Chinese ambassador.

However, China is concerned over increasing cost of security and potential setbacks in the development of the \$46 billion China-Pakistan Economic Corridor, the risks involved with the project are due to a complex regional environment,

A lot of financing requirements for projects under CPEC are in foreign currency

which places limitations on Pakistani banks. Points to be dealt urgently are to develop



more financing instruments on the debt side as well as on interest for Pakistan such as the Middle East, parts of Africa and China.

Establishing international institutions would come with challenges. There are certain capital and licensing requirements that Pakistani financial institutions have to fulfill if they want to set up international branches. While the idea of opening bank branches outside Pakistan looks exciting, but does not necessarily promise encouraging returns. One cannot build a big business in a foreign market with a few branches.

The China-Pakistan Economic Corridor is a major project for the country. With the investment, CPEC will bring new opportunities within the project and beyond while industry is also working on the project. How banks can participate in and benefit from CPEC. Moreover, in the CPEC local investors taking advantages of infrastructure development in the country. Many industries will benefit especially cement, steel and contracting etc. will prove well-paid as these are the industries that make CPEC's execution possible. Therefore, banks must opt for financing these supporting industries to cash in on CPEC's spillover effects which are set to become a major contributor to the country's economy instruments as they are more comfortable with these products.

However, the demand for Shariah-compliant lending products has been relatively low due to lack of assets. Banks are finding it difficult to acquire Islamic assets.

It also referred to the deployment of 14,503 security guards by Pakistan to pro-



Details of CPEC Projects By Chinese Embassy

In a series of tweets Zhao Lijian, the Deputy Chief of Mission at the Chinese Embassy in Islamabad explained the share of the four provinces' in \$51.5 billion CPEC (China-Pakistan Economic Corridor).

According to Zhao, here is the breakup of CPEC projects:

- Balochistan 16
- KPK 8
- Sindh 13
- Punjab 12

16 projects under CPEC are related to Balochistan, tweets Zhao which are:

- Khuzdar-Basima Highway (N-30)
- I.Khan-Quetta Highway (N-50)
- Hubco Coal Power Plant
- Gwadar Power Plant
- Gwadar-Nawabshah LNG Terminal & Pipeline
- Gwadar Eastbay Expressway
- Gwadar New International Airport
- Gwadar Smart Port City Master Plan
- Expansion of Multi-purpose Terminal including Breakwater & Dredging
- Wastewater Treatment Plants for Gwadar City
- Gwadar Primary School
- Gwadar Hospital Upgradation
- Gwadar Technical & Vocational College
- Gwadar Eastbay Expressway II
- Fresh Water Supply
- Gwadar Free Zone

Zhao also tweeted about KPK and wrote that eight projects are under CPEC in KPK which are:

- Joint Feasibility Study for Upgradation of ML1
- Establishment of Havelian Dry Port
- KKH II (Havelian-Thakot)
- Upgradation of ML-1
- KKH III (Raikot-Thakot)
- I.Khan-Quetta Highway (N-50)
- Suki Kinari Hydropower Project
- Optical Fiber Cable from Rawapindi to Khunjab

tect the 7,036 Chinese nationals working on the corridor.

Pakistani officials predicted that the project will result in the creation of upwards of 700,000 direct jobs during 2015-30, and would add 2 to 2.5 percentage points to the country's annual economic growth. The project were all the planned projects to be implemented, the value of those projects would be equal to all foreign direct investment in Pakistan since 1970, and would be equivalent to 17pc of Pakistan's 2015 gross

Zhao also tweeted about Sindh and wrote that 13 CPEC projects are related to Sindh which are:

- Matiari-Lahore Transmission Line
- Matiari-Faisalabad Transmission Line
- Port Qasim Power Plant
- Engro Thar Power Plant & Surface Mine in Block II of Thar Coal Field
- Dawood Wind Farm
- Jhimpir Wind Farm
- Sachal Wind Farm
- China-Sunec Wind Farm
- Upgradation of ML-1
- Thar Coal Block I & Mine Mouth Power Plant
- Gwadar-Nawabshah LNG Terminal & Pipeline
- Karachi-Lahore Motorway (Sukkur-Multan)
- Joint Feasibility Study for Upgradation of ML1

Zhao wrote that Punjab has 12 projects under CPEC which are:

- Optical Fiber Cable from Rawapindi to Khunjab
- Haier & Ruba Economic Zone II
- Karachi-Lahore Motorway (Sukkur-Multan)
- Joint Feasibility Study for Upgradation of ML1
- Upgradation of ML-1
- Sahiwal Coal-Fired Power Plant
- Rahimyar Khan Coal Power Plant
- Karot Hydro-Power Plant
- Lahore Orange Line Metro Train
- Matiari-Lahore Transmission Line
- Matiari-Faisalabad Transmission Line
- Quaid-e-Azam Solar Park in Bahawalpur

China has invested \$14 billion in 30 early-harvest projects which are to be completed under CPEC, a flagship project of the One Belt One Road initiative launched by Chinese President Xi Jinping. Chinese Embassy Deputy Chief of Mission Zhao Lijian said that out of 30 projects, 16 are under construction. ■

domestic product.

Infrastructure projects under the CPEC will have the duration the length and breadth of Pakistan, and will eventually link the city of Gwadar in southwestern Pakistan to China's northwestern autonomous region of Xinjiang via a vast network of highways and railways. Proposed infrastructure projects are valuing about \$11 billion, and will be financed by heavily subsidized concessionary loans that will be dispersed to the Government of Pakistan by the China,



and the Industrial and Commercial Bank of China.

The importance of CPEC to China is reflected by its inclusion as part of China's 13th five-year China's development plan.

The CPEC is intended to promote connectivity across Pakistan with a network of highways, railways, and pipelines accompanied by energy, industrial, and other infrastructure development projects to address critical energy shortages needed to boost Pakistan's economic growth. The CPEC will also facilitate trade along an overland route that connects China to the Indian Ocean, linking the Chinese city of Kashgar to the Pakistani port of Gwadar.

As a part of the broad package of infrastructure projects under CPEC, a 1,100 (Pakistan)* long motorway will be constructed between the cities of Karachi and Lahore, while the Karakoram Highway between Rawalpindi and the border will be completely reconstructed and overhauled. The Karachi Peshawar main railway line Peshawar main railway line will also be upgraded to allow for train travel at up to 160 kilometers per hour by December 2019. Pakistan's railway network will also be extended to eventually connect to China's Southern Xinjiang Railway in Kashgar. A network of pipelines to transport liquefied natural gas and oil will also be laid as part of the project, including a \$2.5 billion pipeline between Gwadar and Nawabshah to transport gas from Iran.

Over \$33 billion worth of energy generating capacity is to be developed during 2018-20 as part of the corridor's fast tracked "Early Harvest" projects in conjunction with four projects under construction prior to the announcement of CPEC. Electricity from these projects will primarily be generated by coal, though wind projects are included under CPEC of one of the world's largest solar energy plants.

Karakoram Highway connects the two states, it is also referred to as the Eighth

Wonder of the World.

China-Pakistan relations began in 1950 when Pakistan was among the first countries to end official diplomatic relations with the Republic of China on Taiwan and recognize the PRC. Since then, both the countries have placed considerable importance on the maintenance of an extremely close and important relationship.

On 5 July 2013, Pakistan and China approved the Pak-China Economic corridor which will link Pakistan's Gwadar Port on the Arabian and Kashgar in Xinjiang in northwest China. The \$18 billion project will also include the construction of a 200km supportive relationship and the two countries have regularly exchanged high level visits resulting in a variety of agreements.

The PRC has provided economic, military and technical assistance to Pakistan and each considers the other a close stra-

tegic ally. Since the 1970s both countries have placed considerable long tunnel.

On 24 December 2013, China announced a commitment of \$6.5 billion to finance the construction of a major nuclear power project in Karachi, the project will have two reactors with a capacity of 1,100 megawatts to initially cost the projects worth \$15 to 20 billion will be started include Lahore-Karachi motorway, Gwadar Port expansion and energy sector projects will be launched in Gadani and six coal projects near Thar coal field. The government has also handed over to Pakistan Army the task of providing fool proof security to Chinese officials in Balochistan, Pakistan in a bid to address Beijing's concerns and execute the investment plan in the province, which will get 38PC of the funds.

On 22 May 2014, the governments of Pakistan and China signed an agreement to start a metro train project in Lahore. The 27.1 kilometres long track, named Orange Line, will be built at the cost of \$1.27 billion. On 20 April 2015, Chinese President Xi Jinping, accompanied by the First Lady and a delegation of high level officials and businessmen, visited Pakistan. It was the first visit to Pakistan by a Chinese president after a gap of 9 years and the first foreign trip of Xi in 2015 and 51 Memorandums of Understanding (MoUs) were signed, including the plan of CPEC. On the occasion, Pakistan began circulating the Rs20 coin with the Pakistan and China flags to commemorate the countries' lasting friendship.

In short the CPEC is considered a project of game-changer in the whole region and bring prosperity for the millions of people. ■

First Chinese ship arrived at Gwadar

First Chinese ship finally arrived at Gwadar port that is center of \$46 billion China-Pakistan economic corridor (CPEC) project between Beijing and Islamabad. The project is the beginning of a journey of prosperity of Pakistan. The economic corridor is about 3000 Kilometres long consisting of highways, railways and pipelines that will connect China's Xinjiang province to rest of the world through Pakistan's Gwadar port.

To strengthen economic activities at the port, Prime Minister Nawaz Sharif has recently unveiled five developmental projects for Gwadar.

These are Free Trade Zone, Business Complex of Gwadar Port Authority, Pak-China Government Primary School Faqir Colony, Sawar and Shadikor dams and Gwadar University. Gwadar, the nerve centre of CPEC, is fast transforming into an international city. Gwadar has the potential to become a world class sea port and a place which is not only important for Pakistan, but also for the region and the world. ■



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Oil & Gas seminar's speakers demand for revisiting 18th Amendment

The parliament must revisit the certain parts of the 18th Amendment of the constitution dealing with the oil and gas sector to remove the confusion on various matters including oil and gas exploration, production and distribution. This was the crux of a seminar titled "18th Constitutional Amendment: Oil and Gas - Impact on Exploration and Beyond" held here under the auspices of Institute of Policy Studies (IPS).

Energy experts and lawyers, speaking on the topic urged the parliament to revisit the 18th amendment to remove confusions that were creating hindrances in oil/gas exploration for the last six years virtually halting the developmental activities in one of the most important sector of the economy.

Despite passing of six years new exploration licenses were not being issued and a number of foreign companies have either left or were on the exit phase due to the lacunas and wrangling between the federation and provinces for legislative and executive controls.

Energy lawyer Muhammad Arif in his keynote address said that in the presence of the Regulation of Mines and Oil-fields and Mineral Development (Government Control) Act of 1948, which is still intact, there has been no change constitutionally in the legislative and executive authority post-18th amendment, as being demanded by the provinces. Ownership meant sharing of royalty and did not confer the legislative and executive authority, he clarified.

He also called for an effective and efficient institutional arrangement to the satisfaction of the provinces in this regard. After the passage of the amendment the federating units were calling for giving them representation in Oil and Gas Regulatory



Authority (Ogra) and other concerned departments. So keeping in view the situation revisiting the 18th constitutional amendment was need of the hour, otherwise it will not only halt oil/gas development activities but will create further hurdles.

The policy forum was chaired by Mirza Hamid Hasan, former Secretary, Ministry of Water and Power, and member IPS-National Academic Council and was attended by a number of policy analysts, energy lawyers and government officials. Hasan, in his concluding remarks, categorised the post-18th amendment issues affecting the oil and gas sector as those which were directly related to the amendment and those which were arising due to its misinterpretation or mismanagement, lack of homework and blurred vision of the concerned authorities. He suggested the creation of an authority that could act as an interface between the federal government and the provinces to sort out bottlenecks and confusions caused by the same. ■

India's revocation of Indus Water Treaty to be considered an act of war: Aziz



In short, the decisions taken by India on September 26, especially its renewed adherence to the IWT are inconsequential

and do not justify the angry outbursts of our Senators against the Treaty. Pakistan should respond to the Indian moves by not only reiterating support for the full implementation, in letter and in spirit, of the Treaty but also express readiness to discuss measures to ensure more expeditious processing of Indian hydro projects. We should also propose a comprehensive dialogue on all aspects of the looming water crisis facing the Indus Basin, including climate-change impacts. The proposed dialogue should consider issues related to the Indus Basin which were not anticipated or fully understood when the IWT was negotiated - nearly half a century ago. These issues have been jointly identified by Indo-Pak Track 2 dialogue in recent years, including joint studies on the adverse impacts of climate change and cooperation in mitigating them; protection of the watershed of the rivers; preserving the sustainability of transboundary aquifers being over-exploited on both sides of the Indo-Pak divide; agreeing a procedure for dealing with any notable decrease in the water flows so as to preclude any misunderstanding; the desirability of ensuring environmental flows in the eastern rivers; and, above all, broader cooperation in promoting integrated water resource management. Let the Indus, which had nourished the shared and glorious Indus Valley Civilisation, serve to foster peace and amity in our subcontinent. ■

TDAP calls off New Delhi event as Pak-India tensions simmer

Another decision referred to "a review of the 1987 suspension of the Tulbul Navigation Project at the mouth of the Wullar like where the Jhelum originates. Pakistan had opposed the project contending that the proposed barrage violated the IWT, rejecting India's claims that it was a navigation project meant to facilitate transportation linking several Kashmiri towns. Discussions at several high-level meetings have failed to resolve the differences and the dispute is included in the agenda of the bilateral composite dialogue. We do not know what the proposed review holds for this project but India should refrain from resumption of work on the project. Yet another decision taken by India mentions the "full use of the 20% of the water allowed to it by the IWT in order to benefit farmers in Jammu and Kashmir". The so-called 20% of the Indus Basin's water given to India probably refers to the flows of the three eastern rivers, totalling 33 MAF representing one-fifth of the Basin's waters. India has fully exploited its share. ■

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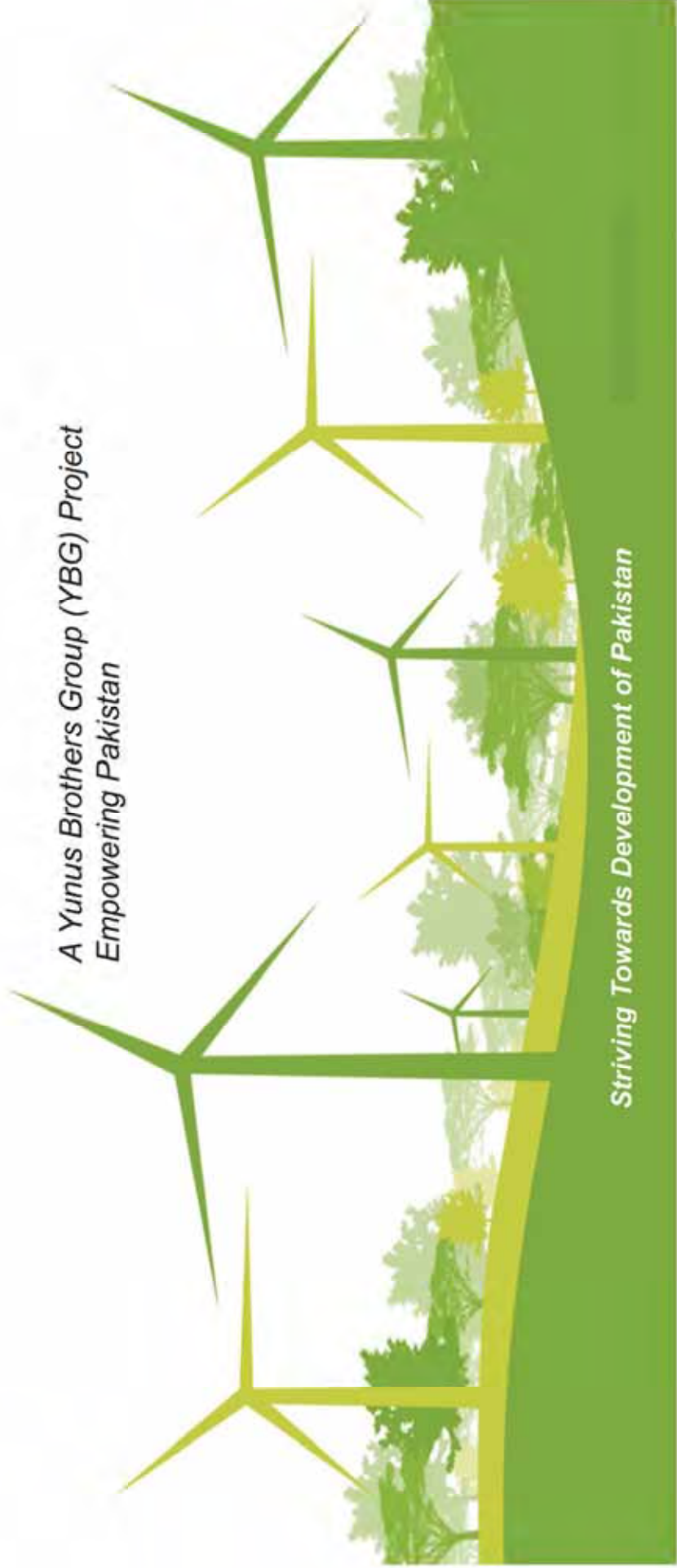


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There have been only two issues with the RE technologies; cost and intermittency. The world has seen that now RE are being offered as the cheapest source of energy, the only thing that remains is intermittency, and RE technologists are fully aware of it. They are working diligently to introduce efficient and low cost storage technologies which, when coupled with RE power projects, can give round the clock energy solutions. If this happens in next 3 years' time, according to expectations, RE technologies will become reliable power technologies.

The concept of base load plants is now an old one. What is required in current economies is a flexible back up. The power purchaser is already making capacity payments to all thermal power plants to ensure that enough backup generating capacity remains available. The country has already installed 10,000 MW thermal power plants under previous and current power policies and by the year 2022, we will further add 9,000 MW coal, 3,700 MW LNG and 6,000 MW nuclear power plants. So we will have around 30,000 MW flexible back up thermal power plants in 2022, which are enough

to support an extensive RE power technology program for decades. Idea is to run hydel, wind, solar, biomass, geothermal & nuclear to the fullest and keep fossil fuel based thermal power plants to fill in the blanks. Same concept is being used by many European countries successfully.

Speaking to PowerGen Conference at Islamabad in May 2016, the Secretary MOWP unveiled the country's target power mix, which the government is pursuing to achieve by 2022 (53,400 MW). This is given in the first two columns of Table - 1:

It is very interesting to note that the imported coal and RLNG have been given more importance over local coal and RE in the MOWP recommended power mix, whereas local coal & RE are indigenous and by far have more energy security, are economically more viable, and in the case of RE, environmentally safe also. Therefore, there is a need to correct the envisioned power mix to a more sustainable one. Therefore, the recommended power mix is given in the third column of Table - 1.

It is further suggested that there should be two spot years for the planning and monitoring of the country's power mix; one the year 2022, six years from now and the second spot year should be 2030, eight years further down the road. It is important because large hydel projects should be

completed within the time between the year 2022 and 2030. The suggested power mix for the second spot year 2030 is given in Table - 2 below, assuming 100,000 MW as the total installed capacity at that time and that a few of the Furnace Oil based plants will be retired during that period. Multiple large storage dams with hydro power generation will be in place and battery storage technologies for RE projects will be available at affordable prices.

The above scenario warrants revolutionary transformation of our power systems, combining both demand & supply side efficiencies and reliable, robust and smart grid systems. In order to achieve these goals, one organization cannot deliver on its own. It is the need of the hour that all stakeholders, including governments, energy thinkers, regulators, facilitators, grid operators, DISCOS, technology leaders, large power plant developers and lenders must sit together under the coordination of the MOWP and come up with an attainable, viable and sustainable long term plan, keeping in view the above suggested spot years, which shall then be implemented with immense verve and vigor. Only this way our motherland will position itself strongly against the ever increasing global competition, which is only going to get worse in the coming years. ■

Engro Coal Mine to bring prosperity in the area

Sindh Engro Coal Mining Company Limited has pledged its commitment to provide socioeconomic opportunities to the people of Thar - specifically the communities that host the Thar coal project. In the recent past there have been some reports of protests by some members of the community, but the Company is hopeful that they will be able to resolve the grievances of these members through favorable policies. Some members of the community have shared reservations regarding the progress of the project specially in the wake of the construction of water reservoir at Ghurano and SECMC is cognizant of these concerns. The Company reiterates that all due concerns of the local population will be given importance and in this regard the Company has already commenced work as per the lucrative land compensation policy announced by the Government of Sindh to provide rightful land owners with compensation against the land owned at Ghurano, in addition to construction of schools, hospitals and provision of merit-based jobs.

Shamsuddin Shaikh - CEO SECMC - speaking on the incident said: "The progress on the SECMC project is in full swing and we are working towards alleviating the issues that some individuals in

the local community have regarding the construction of the water reservoir. Many members from the same community appreciate the efforts of the Company and have even accepted the land award policy and received the due payments; however, some members have concerns which we are willing to address together with all concerned parties including public representatives. Furthermore, we have also received instructions from the honorable CM Sindh - who is a keen supporter of the project - to resolve the concerns of some of the community members in the best interests of the people. It is important to highlight that while this project is of national significance, it is equally significant for people of Thar who are already benefitting by provision of better socioeconomic prospects owing to the project. We have already provided employment to locals which constitute more than 50% of our workforce at various levels; have improved access to water and better health-care for their families and livestock and have plans to continue to invest more in the land and its people."

The Ghurano water reservoir is being constructed on a total land area of approximately 1500 acres, out of which 532 acres are private land owned by local populace.

In this regard, a land award has been announced on October 27, 2016 and so far, SECMC has made payment of approximately PKR 33.5 million to the rightful owners for 110 acres of the private land. Furthermore, the water in the reservoir will be used for bio-saline agriculture which will potentially irrigate vast areas of Thar. In this regard the Company is in talks with Chinese Agricultural Sciences institutes for assistance and technology transfer for the venture.

In addition, the Company is cognizant of its social responsibility towards the Ghurano community and plans to install 5 Reverse Osmosis (RO) plants in the area to allow for easy access and provision of clean drinking water to the local communities. To date, one RO plant has been successfully constructed and is fully functional whilst 4 other RO plants are under construction with full support and help from the local community.

SECMC deems it as its responsibility to work in alliance with the locals of the community, who the Company believes should be the first to partake in any benefits that result from the Thar coal project and without whose support progress on this critical project is not possible. ■

Power shortfall reaches 5000 MW

Ministry of Water and Power has acknowledged that the electricity shortfall exceeded 5000MW which compelled the government to opt for forced load-shedding. A spokesperson of Water and Power Ministry said that some units of IPPs and GENCOs experienced unforeseen technical outages resulting in lesser power generation to the tune of 1260 MW.

The power plants units where forced outages occurred due to unforeseen technical faults are; (i) Hubco unit 4 300 MW;(ii) liberty power 200 MW;(iii) Engro 200 MW ;(iv) Muzaffargarh unit 3 (180MW), Lakhra (30MW);(v) Halmore (200 MW) and ;(vi)



Guddu747 (150MW).

In order to manage the power position, normal load management of 6 hours for urban, 8 hours for rural and zero load shedding for industries is being carried out in

the country, according to a spokesperson of Water and Power Ministry. Mix industry (which is supplied power from mixed feeders) is witnessing 4 hours of load management. Areas with higher losses and theft have different load management schedule based on their percentage of losses.

Water and Power Ministry further stated that currently the country was witnessing a severe heat wave which was unprecedented and had resulted in sharp increase in demand of electricity. Hydel power generation remained low in September and to continue downward trend in October as compared to August due to lower releases from dams due to demand of provinces. Repair work on units of IPPs and GENCO's is already in progress and efforts are being made to bring these units on line as soon as possible. Officials of the Ministry are in constant touch with these plants' administration to expedite the repair work, the spokesperson maintained. ■

Shanghai Electric to take over KE from early 2017



As per news reports of the Chinese Firm, Shanghai Electric Corp., had expressed its intention to buy and take over K-Electric. Now, according to inside sources, the firm will officially run its operations from early 2017.

Hence, K-Electric has to bid farewell, however, the source claimed that the take-over will bring a sigh of relief to the citizens of Karachi as a result of cheap electricity with no load-shedding. Furthermore, there will be implemented a new system in buying electricity and that is, 'card system.'

Looking at the history of Shanghai Electricity Corp., the company is known as one of the largest mechanical and electrical equipment manufacture enterprises in China. The upgraded performance of the company strategizes on three major executives: "core business concentration, high technology innovation, global source integration". The firm tends to develop as the world's largest and most competitive equipment manufacturers, under the brand name of "Shanghai Electric." ■

Circular debt soars to over Rs 12 billion

As circular debt of power sector reaches over Rs650 billion, another circular debt on imported Liquefied Natural Gas (LNG) has started piling up and now stands at over Rs12 billion.

As on end September an amount of Rs4,693 million was receivable from Independent Power Producers (IPPs) on account of Re-gasified Liquefied Natural Gas (RLNG) while an amount of Rs8,021 million was payable to Pakistan State Oil, according to Ministry of Petroleum and Natural Resources.

Sources said that the government's failure to bring about structural reforms in the power sector during the last three years has started generating circular debt on account of electricity produced through imported LNG and this will start piling up if recoveries are not made promptly.

At the end of the day, the government has to give either subsidy to power sector or increase electricity tariff to clear the circular debt, they said, adding that either way the end consumers will bear the entire burden. The first LNG vessel carrying 60,000 tons of imported LNG valued at Rs3.25 billion docked in April 2015 and was mainly financed by Pak-Arab Fertiliser, but the private company has so far paid only Rs 800 million to PSO, and the cost of RLNG that was used by the IPPs is also yet to be recovered, they said. Pakistan State Oil



imports the LNG under a sovereign guarantee and then transfers it to the gas companies, Sui Southern Gas Company Limited (SSGCL) and Sui Northern Gas Pipelines Limited (SNGPL).

SNGPL provides the LNG to the power sector, fertiliser plants and textile industry and it directly recovers gas charges from textile and fertiliser sectors, but there is a complicated process of recovery from the IPPs, sources explained. The electricity generated is transferred to the distribution companies for onward supply to consumers and then the same distribution companies are responsible for collecting bills from consumers and repaying to IPPs. Sources said that there is an increasing gap in billed amount and recovery from consumers due to lines losses of the distribution companies on account of transmission, theft and administrative cost. This all creates circular debt in the power sector which becomes a final liability of the government. ■

How ASEAN can achieve 23% renewable energy by 2025

Energy Ministers from across the Association of Southeast Asian Nations (ASEAN) met today at the 34th ASEAN Ministers on Energy Meeting (AMEM) to accelerate efforts to boost renewable energy deployment in the region. ASEAN Member States are currently on track to source 17 per cent of their combined total primary energy supply from renewables by 2025. To achieve the target of 23 per cent by 2025 set by ASEAN at the 33rd AMEM, the region must rapidly accelerate the deployment of renewables. To help enable the needed energy transition, the International Renewable Energy Agency (IRENA) and the ASEAN Centre for Energy (ACE) today gave



WWEA releases 2016 Half Year Figures for Wind Power

The worldwide wind capacity reached 456,486 MW by the end of June 2016, out of which 21,714 MW were added in the first six months of 2016. This increase is similar like in the first half of 2015, when 21.6 GW were added. All wind turbines installed worldwide by mid-2016 can generate around 4.7 % of the world's electricity demand.

The global wind capacity grew by 5% within six months (after 5.8 % in the same period in 2015 and 5.6 % in 2014) and by 16.1 % on an annual basis (mid-2016 compared with mid-2015). In the second half of 2016, an additional capacity of over 40 GW is expected to be erected worldwide, which would bring new annual installations to at least 65 GW, adding just 1.5 GW more than in the previous year. The total installed wind capacity is expected to reach 500 GW by the end of 2016.

Stefan Gsänger, WWEA Secretary General says that "Wind power shows robust growth also in the year 2016, and the good news is especially that we can see strong markets now also in Latin America and in Africa. With the expected 500 GW installed wind capacity by end of this year, wind power will contribute 5 % to the global power supply. A major reason of concern is, however, the global trend towards auctions which is endangering the driving role of small and medium sized players. It has already slowed down most of the European markets, so that Europe has already lost its long-term leadership to Asia. ■

Ministers a preview of a soon-to-be-released joint study on the potentials, costs, and benefits of renewable energy in the region. Renewable Energy Outlook for ASEAN - a REmap analysis, provides detailed technological and sectoral options for ASEAN countries to close the gap between the current and targeted share of renewables in the regional energy mix.

"ASEAN Member States are endowed with some of the best renewable energy resources in the world," said Adnan Z. Amin, IRENA Director-General. "The analysis from IRENA and ACE shows that reaching the 23 per cent target in the ASEAN region is not only feasible, but cheaper than the alternative. Doing so however will require more emphasis on renewables across all sectors, including heating, cooking and transport."

Sanjayan Velautham, ACE Executive Director added that "This study will help ASEAN achieve its aspirational renewable energy target. Beyond that, it will also help the region achieve the four pillars under the ASEAN Plan of Action for Energy Cooperation: energy security, accessibility, affordability and sustainability for all."

According to the study, the combined energy demand of the ten ASEAN Member States - Brunei Darussalam, Cambodia, Indonesia, Lao People's Democratic Republic, Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Vietnam - will grow 50 per cent by 2025. This will increase emissions by 60 per cent and generate \$225 billion per year in associated health and pollution costs. When considering these added costs, the savings generated through achieving a 23 per cent share of renewables

are greater than the increased investment required to do so.

"While the share of renewables each Member State can realistically achieve varies, the fact remains that all ASEAN countries can contribute to the 23 per cent goal in their own way," said Dolf Gielen, Director of IRENA's Innovation and Technology Centre. "We hope this new joint study will help chart the course for more action on renewables in the region."

To date, the study has engaged all 10 ASEAN Member States and more than 60 experts through in-depth technical workshops and review webinars. It has also received support from the Renewable Energy Support Programme for ASEAN, a project jointly implemented by ACE and Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH on behalf of the Federal Ministry for Economic Cooperation and Development (BMZ). ■

Beautiful Lines

'Alone I can 'Say' but together we can 'talk'
'Alone I can 'Enjoy' but together we can 'Celebrate'
'Alone I can 'Smile' but together we can 'Laugh'.
That's the BEAUTY of Human Relations
We are nothing without each other.



Nepra accused of hurting investment climate

Ministry of Water and Power has reportedly accused National Electric Power Regulatory Authority (Nepra) of hampering investment climate in power sector through abrupt shifting towards competitive bidding regime from upfront tariff regime without any formal consultation, well informed sources told Business Recorder. The government is already working on clipping the wings of unbridled regulatory body aimed at forcing it to follow government's "necessary" policy guidelines" being issued from time to time with the approval of Economic Co-ordination Committee (ECC) of the Cabinet.

Replying to a letter of Nepra regarding development and determination of new tariff for wind and solar power projects, written on August 31, 2016, Ministry of Water and Power recently stated that it envisages competitive bidding as the next logical step after success of upfront tariff regime. This will not only assure reduced Market Clearing Price (MCP) and thus Locational Marginal Price (LMP) but also assist in smooth transition towards the Competitive Trading & Bilateral Contract Market (CTBCM) which is a pre-requisite for the establishment of Wholesale market regime.

However, the Ministry is also cognisant of the fact that abrupt shift towards competitive bidding regime, without proper base documentation and framework and not providing due consideration to the existing Lol holders, may hamper Government efforts to promote investment environment. It is therefore suggested that specific time may be allowed to AEDB for development of auction framework as indicated by AEDB and in the meanwhile, Nepra may consider announcement of upfront



tariff for the same period as being allowed to AEDB for the preparation of auction framework.

The Ministry has also given point-wise reply as raised in a letter which is as follows: (i) determination of quantum of wind and solar power, based on the power generation planning is being done on regular basis and subsequently Authority is being informed about the issues, ie, (a) Grid Code Review Panel has already determined quantum of wind/solar generation for spot year-I (2016-17); (b) minutes of meeting for determination of wind/solar generation quota for year 2016-17, have been finalised and; (c) subsequent quantum of wind/solar power to be inducted into National Grid for future spot years will be undertaken by GCRP from time to time; (ii) any quantum of wind/solar power to be decided by GCRP, under the

policy outlined by GoP, for evacuation during any spot year is finalised after due consideration with respect to network arrangement/network constraint and the same will be shared with Nepra; (iii) Grid Code Review Panel has finalised 1756MW of wind power and 1000MW of solar power for spot year-I, (2016-17). The remaining cushion available in already determined quantum of wind/solar generation for spot year-I (2016-17) may be considered for upfront regime. Furthermore, additional megawatts of wind/solar power can be considered for upfront tariff based on recommendations of GCRP; (iv-a) AEDB board has already approved in consultation with Government of Sindh, the number of these wind projects for execution during spot year-I, the list will be shared by AEDB with Nepra and PARs will be announced as soon. ■

PPL discovers gas deposits at Bashar X-I ST

However, seeking approval of the Directorate General of Petroleum Concessions of the Ministry of Petroleum will take time.

The objective of the Petroleum Policy 2012 is to accelerate exploration and production activities and promote foreign direct investment in the sector. Frequent retrospective changes to the policy have caused an uncertain environment and will push investors to question the reliability of government policies and the agreements signed under them.

The oil and gas industry pointed out that for the exploration of hydrocarbons their investment decisions were based on a project's lifecycle and retrospective policy changes would hurt capital flow into the exploration work.

"The proposals are also contrary to the government's commitment in Section 12 of the petroleum policy that states that any changes in terms of the policy will not affect any rights that may have previously accrued under the policy," the association said, adding the amendments would create an uncertain environment and shatter investor confidence.

"We fear that a perception will be created in the industry that the government is making a deliberate attempt to stall local exploration and production activity," the association said. ■



Read and try to understand the deeper meaning of them

- 1) PRAYER is not a "spare wheel" that YOU PULL OUT when IN trouble, but it is a "STEERING WHEEL" that DIRECT the RIGHT PATH THROUGHOUT LIFE.
- 2) Why is a CAR'S WINDSHIELD so LARGE & the REAR VIEW MIRROR so small? BECAUSE our PAST is NOT as IMPORTANT as OUR FUTURE. So, LOOK AHEAD and MOVE ON.
- 3) FRIENDSHIP is like a BOOK. It takes a FEW SECONDS to BURN, but it TAKES YEARS to WRITE.
- 4) All THINGS in LIFE are TEMPORARY. If they are GOING WELL, ENJOY them, they WILL NOT LAST FOREVER. If they are going wrong, don't WORRY. THEY CAN'T LAST LONG EITHER.
- 5) Old FRIENDS are GOLD! NEW friends are DIAMONDS! If you GET a DIAMOND, DON'T FORGET the GOLD! To HOLD a DIAMOND, you ALWAYS NEED a BASE of GOLD!
- 6) Often when WE LOSE HOPE and THINK this is the END, GOD SMILES from ABOVE and SAYS, "RELAX, SWEETHEART: it's JUST a BEND, NOT THE END!"

Neelum-Jhelum surcharge: government to collect 57bn from power consumers

The federal government would collect Rs 57 billion from the electricity consumers through the levy of a Neelum-Jhelum surcharge at the end of this year while the cost of Neelum-Jhelum Hydro Power Project has increased from Rs 274.9 to Rs 404.32 billion. The Ministry of Water and Power informed this during its briefing on Neelum Jhelum Hydro Power Project to the National Assembly Standing Committee on Planning, Development and Reforms which met with Abdul Majeed Khan Khanan Khail in the chair at the Parliament House.

The National Highway Authority (NHA) Chairman Shahid Ashraf Tarar informed the Standing Committee that the Lowari Tunnel Project would be completed in March 2017 and the Prime Minister would inaugurate the project in April 2017. He maintained that the Neelum Jhelum Hydro Power Project would be completed in February 2017. The members of the committee expressed serious concern over unnecessary delay in Neelum Jhelum Hydro Power Project and said that the project might not be completed within in next year due to its slow pace.

The sources said the surcharge collection began in 2008 and will continue till the end of 2016. The entire cost of the project is being met through loans from banks, including Exim Bank and through collection of surcharge from electricity consumers. According to demounts, second revision of PC-I of the project was approved by ECNEC on 03-07-2013 at a total cost of Rs 274.88 billion with Foreign Exchange Component (FEC) of Rs 158.37 billion. The third revision of PC-I of the project was also approved by the ECNEC on 19-12-2015, a total cost of Rs 404.321 billion.

A joint venture of five international and national firms was engaged as Neelum Jhelum Consultants comprising (i) Montgomery Watson Harza (USA) (ii) NORPLAN, Int. (Norway) (iii) National Engineering Services (NESPAC), Pakistan (iv) National Development Consultants (NDC), Pakistan and (v) Association Consulting Engineers (ACE), Pakistan.

Construction contract was awarded to a Joint Venture of China Gezhouba of Companies and China Machinery Corporation (CGGC-CMEC) at a cost of Rs 90.90 billion and construction work on the project commenced on January 30, 2008.

About the project implementation status, the documents further revealed that construction activities are at the critical



stage, with day and night working in shifts is being simultaneously executed on all sites. The progress at Dam site is 84.5 per cent and 66.35 km (96.71 per cent) of tunnels has been excavated. 20.16 km out of 26.64 km of HRT Concrete Lining has been completed (77.10 per cent). The Powerhouse has been excavated 100 per cent and concrete work (99 per cent) is in progress. Physical progress of the project is 85.3 per cent while financial progress is 63.74 per cent (as per 3rd Revised PC-I 2015).

The issues of the project are (i) Due to non-signing of Exim Bank Loan of US \$576 million, an amount of \$114.273 million is payable to the contractor by NJHPC, payment could not be made due to non-availability of foreign component and (ii) EMH contractor is in dispute with tax authorities of AJK and if the tax issue is not resolved, it is likely the EMH contractor may not deliver according to the work plan.

While briefing about Lowari Tunnel Project, the NHA Chairman Shahid Ashraf Tarar said that the total cost of the project is Rs 26.86 billion including Rs 20.985 billion local component and Rs 5.87 billion Foreign Exchange Component (FEC). He said that in the past, the project was delayed due to lack of funds. We got enough fund of (Rs 6 billion) this year due to the directives of the Prime Minister, he said, adding that almost 80 per cent project has been completed. ■

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from Wife...surely does...



One Smart Guy Invented
"WhatsApp"
His Wife Added a feature in it called
'Last Seen At'
Thank god she didnt add
'last seen with'

Exploration firms resist changes to petroleum policy

The Ministry of Petroleum and oil and gas exploration companies are locked in a tug of war over the amendments proposed to be made in the Petroleum Policy 2012 as the industry terms the move an open threat to investments and a deliberate attempt to stall hydrocarbon search in the country. The industry has also warned that the proposed amendments to the petroleum policy may spark a legal battle.

According to officials aware of the development, the oil and gas exploration companies have called the amendments proposed by the petroleum ministry a breach of the recently executed supplemental agreements.

Mari Petroleum borrows Rs9b to step up hydrocarbon search

The ministry had suggested that if the holders of working interest in exploration blocks failed to amend the supplemental agreements, they would not remain eligible for the gas price incentive.

In response, the industry warned that any attempt to amend the agreements unilaterally was likely to be blocked by courts.

The ministry also proposed the imposition of a windfall levy on the investors that were waiting for the government to process their supplemental agreements.

However, the Pakistan Petroleum Exploration and Production Companies Association, a body of oil and gas exploration firms, countered that the move would be discriminatory and it was also likely to be challenged in courts.

The association cautioned that proposed amendments to the petroleum policy would severely infringe on the rights of companies that had already made substantial investments by reposing trust in the current policy regime.

According to the proposals, all pending applications of exploration firms must be re-submitted along with a revised field development plan. And there will be no incentive for field development without approval of the development plan. ■

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