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ENERGY CRISES IN PAKISTAN VIS-À-VIS DISASTERS

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Abstract: Pakistan by the grace of Almighty Allah is having huge energy potential but this capability has not been explored fully but with exception of some large hydel works. An endeavor has been put-in by the Govt now to incorporate renewable energy in the development strategy. The strategy will be implemented in three phases. Exploring different energy resources and their use can help Pakistan to come out from this quagmire. Hosts of allied problems like extra costs and dangers of fuel stocking, carriage, and alternative arrangements will be minimized. Global warming, green house gasses, environmental degradation and other related problems will be reduced using alternative energy resources. This will also reduce the energy related hazards.

Keywords: Renewable energy, climate change, energy consumption, impediments

BACKGROUND

Our country has hosts of energy resources however, no worthwhile effort has been plugged-in to get benefit from them and still there is an acute shortage of energy. Thereby, these resources are being received from different sources with exorbitant prices. Resources which are feasible in Pakistan are mini-hydel, bio-gas, wind and solar. But increasing requirements on these meager resources has been a prime environmental worry for the nation. This problem is more compounded owing to danger of pollution. It is an established fact that Pakistan's energy infrastructure is underdeveloped and poorly managed.

Presently the nation is experiencing awful energy shortfall. Energy capability is one of the important facets of economy and contributes tremendously in the sustainable development of a country. Owing to rapid industrialization and population growth the requirement has been increased manifold but on the contrary alternative energy sources have not been identified. Requirement is not compatible with existing capability, so situation of crisis is prevailing. It is fairly contemplated that in future if proper steps are not taken then much energy related issues can erupt, thus inviting emergency situations and disasters.

Owing to location of the country in the seismic zone and rapid industrial advancement possibility of natural and manmade hazards is always there. To address this menace, various actions have been in the offing these are not meeting the desired requirement. In view of consequential effects of energy hazards turning into disasters, there is a need to work out a clear road map to tackling the energy related disasters that is proactive, comprehensive and progressive.

INCREASED ENERGY CONSUMPTION

It is an established fact that provision of energy supply is very less and secondly it is not being used optimally, thereby gap is

increasing. Alone the electricity has decreased approximately 1.8% reduction in Grand Domestic Product. Energy has been a serious problem from year 1971 in general and for the last one decade in particular. For the last forty years no worthwhile effort has been put-in by the Government to explore new energy resources with exception of some miner works on it.

Supply of energy vis-à-vis consumption

Pakistan's energy requirements have increased manifolds for the last three decades. In comparison, China's per capita energy consumption in 2000 was 30.89 M Btu, Iran's was 80.30 and Russia's was 195.35, while America was having 341.75 M Btu.

Supply

Both supply and current availability of energy saw awful for the last couple of years. Pakistan needs around 16,000 to 19000 MW electricity per day, however, presently generation is approximately 11,000 MW per day, so this menace is badly deteriorating the economic development of the country.

Consumption

Our energy requirement currently is fulfilled by host of sources like natural gas, oil, electricity and coal. Share of gas consumption was 43.77%, oil 29.5 %, electricity 15.35 %, coal 10.45 % and LPG 1.55 %. We have been facing an acute shortage of energy for the last couple of years. The problem becomes more complex from June to August every year. The deficiency has been met owing to cheap energy produced through hydel and gas however; substantial production is contingent upon hydel energy. The authorities should take pragmatic measures on god speed bases to meet the deficit.

CURRENT AND POTENTIAL SOURCES OF ENERGY IN PAKISTAN

Owing to decrease in oil reservoirs and its ill effects of global warming and environmental degradation, the World is now near the brink of energy crunch. Countries are now realizing this problem seriously and

are trying to explore and produce energy from alternative sources other than fossil oils. Currently, hydel and nuclear energy is the safer and economical means to replace the fossil fuels. Sources of energy are proffered in the ensuing para:-

- ✓ **Natural Gas Exploration.** Pakistan still has huge untapped gas reserves. If we allocate more resources to their exploration there is a possibility that in the near future part of the energy resource gap may be met from new reserves. The current gas prices and the limits they place on increasing the profitability of this sector would not attract any reasonable amount of investment, whether local or foreign, since the cost of exploration has gone up substantially and current well head prices do not justify further investment at the current rate of return. The other factor discouraging exploration of new gas reserves, which would continue to haunt us, is the law and order situation in most of the areas where gas finds can be a possibility.
- ✓ **Natural Gas Import.** The proposed gas pipeline project to import the gas from Iran is in pipe line since long. Earnest efforts are being made by every Govt to commission this project but owing to nefarious designs of certain super powers the progress is somewhat slow on the subject. This project will at least take five years to complete. Nevertheless, it will certainly reduce the energy deficit and Govt has to vigorously pursue the issue on priority basis.
- ✓ **Thar Coal.** Pakistan is very rich in coal deposits, alone Thar has coal strip of 100 x 40 kms long and almost 40 m deep reservoir. We are 5th in the World in Coal deposits. It has electricity generation capacity more than a lac Mw for next three decades. But currently owing to non-availability of requisite capability full potential is not being harnessed. However, with the help of China some progress has been made. We have to speed up the process. In addition to electricity, water and gas will also be available from this facility.
- ✓ **Hydro Power.** Our country is having abundance of hydel energy resources; however, desired efforts are being made in this field. We have only two mega dams and some small dams, which contribute even less than 35 % of overall potential. Currently we are having only 6000 MW against the capability of more than 40000 MW.
- ✓ **Solar Energy.** Geographically we located at a point that solar energy can be fully harnessed. Almost throughout the country this facility is available. For the last two decades sense has prevailed and this area is under focus. Presently solar energy use is increasing day by day. In this regard Government has to produce requisite capability in terms of equipment and experts.
- ✓ **Wind Energy.** Almost every country is paying special attention toward this source. Developed countries like America, China etc., have done much in this field. They have achieved more than 31000 MW from this source. This energy is now considered to be the efficient source in the World. Need of the hour is to invest

heavily in this field. Our Sind province is rich in wind potential and much work has been started in the region which will accrue rich dividends soon.

- ✓ **Tidal.** This is cheap type of source available in our country and can contribute tremendously in the overall grid capacity. Coastal tides are a prime source of this type of energy. Much studies and works have been in the offing to harness this potential optimally and get benefits out of it.
- ✓ **Nuclear Energy.** The “Chashrna Plant” was developed with the support of China and is being used by our scientists and engineers, thus adding 300 mw to the national grid. KANUPP was developed with the assistance of the Canadian Govt in 1960 and it has almost outlived its utility. Pakistan is the only country in the Muslim World operating nuclear power plants. Nuclear power is safer, economical and cause less degradation to the environment.
- ✓ **Geothermal Power.** This source of energy is suitable for the developing countries. Nevertheless, geothermal stations can be placed at rocks which are developed under the ground. Approximately, we have some 80,000 MW geothermal energy present in Himalayan. But it is not suited for us due to huge cost. Moreover, we have alternative sources of energy.

HURDLES IMPEDING THE SOLUTIONS TO THIS CRISIS

There could be as many a reasons a one could think of but primarily they could be distributed in the following broad categories:-

- ✓ **Circular Debt.** It is visualized that no one is serious in clearing the IPP's circular Debt. Upon clearing the debt, IPP's will function properly, thus delivering optimally. Till the time debt is cleared this situation will remain.
- ✓ **Line Losses.** We are experiencing huge line losses, owing to poor quality conductors, poor maintenance and theft cases. Thus in the process the overhead burden increases and this result into short fall and expensive electricity.
- ✓ **Inadequate Power Generation Capacity.** Most of our systems and appliances operate by using coal and gas, which is very costly. Both Gas and Coal are very expensive owing to non-availability of requisite expertise. We should try to use alternative energy sources and to increase the generation capacity.
- ✓ **Lack of Capacity of Distribution of Electricity.** Our distribution system is weak owing to poor end grid system as the existing infrastructure has outlived the utility. The current systems are not versatile and many problems are being faced specially during bad weather. Most of our supply system is based on two phase supply. Even by producing 3 phase electricity, it will not work if existing transmission is of 2 phase.
- ✓ **Issue of K.E.S.C.** After the privatization, K.E.S.C, has sufficient production but alone it is not enough, the Government must provide a dedicated transmission system as our two provinces get electricity from this source.
- ✓ **Dependence on IPP's.** These projects at present are providing electricity to almost 50 % of our country. Since their dues are not

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being paid regularly so now they are asking more prices from the users. This situation is affecting not only our industrial base/homes but also our imports. We must pay their dues.

ENVIRONMENTAL EFFECTS OF ENERGY AND RELATED DISASTERS

To reduce the ill effects of energy and related disasters, a pragmatic strategy is required to use the energy resources. A close interaction amongst researchers and environmentalists demands that newly developed energy sources is not only technologically feasible but also have a good impact on the environment. Less use of fossil fuels, energy security and awareness of damage by greenhouse gases are main factors in the development of future energy solutions. By using alternative energy sources problem of environmental degradation will be reduced considerably. However, both positive and negative effects are explained in ensuing para.

- ✓ **Water Wars** India is planning and constructing large number of projects on western rivers (as per Indus Basin Water Treaty she cannot) allotted to Pakistan which will result in reduced share of water for Pakistan. Pakistan needs to adopt a more comprehensive, proactive and professional approach to deal with the situation. Unless tackled intelligently, Pakistan is bound to face serious shortage of water in years to come. This will not only result into tension with India but will also increase disharmony and mistrust amongst the provinces.
- ✓ **Civil Unrest** The energy crisis situation starts from nineties and still it persists. The swerve and awful amongst all the shortage of electricity. We are facing a huge electric crisis currently. So far no worthwhile solution is visible except reliance on Thar coals and Iran Pakistan gas pipe line project. If this situation persists then there are likely chances of civil unrest leading to complex situations.
- ✓ **Out Break of Forest Fire** It is an established fact that wood is being used in host of fields. In the quest of getting energy from this source if proper procedures are not in place, then there is always a great danger of forest fire, which can lead to disaster situations.
- ✓ **Hydel Energy and Dam Failures** Although the cheapest energy now a days is the hydel energy but World is now not advocating construction of large dams owing to devastation caused by these. Many countries like China are now advocating for small capacity dams instead of big ones. Thereby, there is always a danger of dam failure especially in Earth Quake of higher magnitude, thus leading to disaster situation.
- ✓ **Coal Mining and Associated Disasters** Pakistan is blessed with huge deposits but so far we do not have the requisite expertise to remove the overburden and extract the coal. Thereby, owing to non-availability of modern equipment to extract deep seated coal, our workers always remain susceptible to life dangers.
- ✓ **Nuclear Energy** We are getting handsome energy from nuclear. Although the development of energy is much safe but the possibility of nuclear hazard cannot be totally ruled out.

✓ **Natural Gas and Associated Disasters** We have ample untapped gas reserves. If we provide requisite resources to their exploration then there is a possibility that in the near future part of the energy resource gap may be met from new reserves. But due to fragile environment in country the events of destruction of the gas pipe lines will remain, thus creating emergencies.

✓ **Oil Spill Over** Although the oil transportation through sea is economical and safe as well. But the danger of oil spillage always remains, thus prone to secondary hazards in addition to losses.

Possible Disasters Scenarios at Various Levels. If we do not adopt a more comprehensive, proactive and professional approach to deal with the situation then disaster situations can emerge, starting from regional lvl i.e. with India, Iran and fghanistan, national, provincial, and domestic levels:

- ✓ Owing to water manoeuvres by the India and disregarding the Treaty, the tesion in near future can emerge.
- ✓ If any country wants to use the energy resources of Central Asian States (CARs) then only land route available is through Balochistan. Therby, this ares will remain under focus and tesnion. Secondly all the foreign players also eyeing on the deep seaated resources of Balochistan Province.
- ✓ Currently we are facing hosts of energy crisis. And it will likely face about 6000 MW next year. Pakistan is also facing some 70 million tons of oil shortage. And is lacking behind the needs of natural gas at about 28 million ton of energy in current year and this ratio will rise in coming years. This will lead to unrest both at province, district and local level.

PROPOSALS

We are facing huge energy crisis situation owing to hosts of factors like inadequate generation capacity, non-availability of requisite technology, miss management etc. Current electricity system is not only controversial but also lacks capacity vs. demand. Time has come that we should come out from IPP business and well upon on new and cheap energy sources to curb this crisis.

The remedial measures are.

- ✓ **Conservation of Energy.** It is of paramount importance to save energy in all fields. Awareness is there amongst every citizen but there is a dire need of education the people at community level. We should educate the people how energy can be saved. Some of the ways are as under:
 - Proper heat insulation of structures.
 - Solarization where possible.
 - Use lights which consumes less voltage & produce more lumens.
 - Use of better quality conductor.
- ✓ **Improvement of Energy Shortfalls:**
 - We must go for solarization and make use of this facility where ever is possible and there should be less reliance on expensive sources.
 - Proper law should be made for use of energy by the industry which almost consumes one third of energy.

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- Industrialist must be encouraged to produce own energy thus reducing the burden on national grid.
- Old plants and turbines must be replaced to increase the capacity.
- New techniques be introduced to decrease the losses.
- Communication infrastructures be improved to save on the fuels and allied expenditures.
- Less reliance on IPPs as they are too expensive.
- To reduce the line losses by using good conductors and providing pragmatic transmission and distribution.
- ✓ **Developing New Energy Resources:**
 - Utilization of the huge deposits of Thar coal.
 - By making best use of hydel energy by constructing small size dams.
 - The process of gas import from Iran must be expedited.
 - The process of import of electricity from Tajikistan must be expedited (1100 MW).
- ✓ **Alternative Energy Resources:**
 - Wind power energy in Sindh and Baluchistan Provinces.
 - Solarization.
 - Wave / Tidal energy.

CONCLUSION

The importance of hydel energy cannot be ruled out but we have so far failed to harness the importance and benefits of renewable sources of energy. In all probabilities they are most economical and beneficial. We are blessed with hosts of energy resources. But so far no worthwhile effort has been put in to get benefit from these blessings. We have to develop the Thar coal project, solar energy, wind energy etc. to pragmatically reduce the shortfall. We are certain new Govt is cognizant of the issue and will initiate a serious resolve to overcome this menace.

The need of the time is the realization of the fact that energy is being the life line for survival of the nation. Thereby, implementation of an immediate relief policy followed by a long term strategy for improvement is required.

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