Energy crisis

Environment, Ecology

An energy crisis Is any great shortfall (or price rise) In the supply of energy resources to an economy. It usually refers to the shortage of oil and additionally to electrlclty or other natural resources. The crlsls often has effects on the rest of the economy, with many recessions being caused by an energy crisis in some form. In particular, the production costs of electricity rise, which raises manufacturing costs.

For the consumer, the price of gasoline (petrol) and diesel for cars and other vehicles rises, leading to reduced consumer confidence and spending, higher transportation osts and general price rising. AIM 2. The aim of this assignment is to highlight the crises which Pakistan is facing in terms of energy. MAIN BODY 3. Energy resources have depleted! Whatever resources are available are simply too expensive to buy or already acquired by countries which had planned and acted long time ago.

Delayed efforts In the exploration sector have not been able to find sufficient amounts of energy resources. Nations of the world which have their own reserves are not supplying energy resources anymore; only the old contracts made decades ago are active. Airplanes, trains, cars, motorbikes, buses and trucks, all odes of transportation are coming to a stand still. Many industries have closed due to insufficient power supply. Price of oil has gone above the ceiling. At domestic level, alternate methods like solar, biogas and other methods are being tried for mere survival 4.

The above is a likely scenario of Pakistan and around the globe after 25 years. A pessimistic view, but realistic enough to think about and plan for the future. But are we doing anything about it? Lets have a look at the current

energy situation of Pakistan and the world. Pakistan's economy is performing at a very high note with GDP growing at an exceptional rate, touching 8. 5% in 2004-05. 1n its history of 58 years, there has been only a few golden years where the economy grew above 7%.

This year official expectations are that GDP growth rate will be around 6. 5 - 7. 0%. For the coming years, the government Is targeting GDP growth rate above With economy growing at such a pace, the energy requirements are likely to increase with a similar rate. For 2004-05, Pakistan's energy consumption touched 55. 5 MTOE (Million Tons of Oil Equivalent). 5. The energy consumption is expected to grow at double digit if the overall economy sustains the targeted GDP growth rate of 6% by the government.

Pakistan's energy requirements are expected to double in the next few years, and our energy requirements by 2015 is likely to cross 120MTOE. By 2030, the nation's requirement will be 7 times the current requirement reaching 361 MTOE. Pakistan's energy requirements are fulfilled with more than 80% of energy resources through Imports. 6. Pakistan is most likely to face a major energy crisis in natural gas, power and oll In the next three to four years that could choke the economic growth for many years to come, official estimates and energy experts suggest.

Pakistan's total energy requirement would Increase by about 48 per cent to 80 million ons of oil equivalent (MTOE) in 2010 from about 54 MTOE currently, but major petroleum minister on condition of anonymity for the simple reason that he had also served the present government. 8. Major shortfall is expected in the natural gas supplies, he said. According to official

energy demand forecast, he added, the demand for natural gas, having about 50 per cent share in the countrys energy consumption, would increase by 44 per cent to 39 MTOE from 27 MTOE currently.

Partly contributed by gas shortfalls, the power shortage is expected to be little over 5, 250MW by 2010, he said, adding that the oil demand would also increase by over 23 er cent to about 21 million tons in 2010 from the current demand of 16. 8 million tons. This would leave a total deficit of about nine million tons of diesel and furnace oil imports, he said. Since the gas shortfalls were expected to be much higher, the country would need to enhance its dependence on imported oil, thus increasing pressure on foreign exchange situation, he added. 7.

According to the former minister, the government had planned five major initiatives to meet these energy requirements. They included three gas import pipelines, Gwadar port as energy hub and LNG import. However, four of these measures, including the three import pipeline projects, show no signs of progress for various reasons while concentration on energy facilities in Gwadar would chiefly depend on security situation, besides oil and gas import pipelines. 8. Planning Commission sources said the government had planned to add an overall power generation capacity of about 7, 880MW by 2010.

Of this, about 4, 860MW is to be based on natural gas, accounting for 61 per cent of capacity expansion. However, the gas-based power expansion of about 4, 860MW would remain in doubt since these estimates were based on gas import options for ompletion in 2010, 201 5 and 2020, said the sources.

The fifth initiative of LNG import was on schedule and would start delivering about 0. 3 billion cubic feet of gas (BCFD) by 2009 and another 0. 5 BCFD by 201 5, said the sources. 13. Pakistan's gas reserves are 32. TCF at present, with reserve-production ratio in the order of 27 years, considering that domestic production does not grow substantially. Power sector demand represents 41 per cent of total gas consumption, general industries 24 per cent, fertiliser 7. 8 per cent and domestic-commercial 22. 8 per cent, cement 1. 5 per cent and CNG 2. 8 per cent. . Demand growth has been up to 8. 5 per cent in recent years and is expected to be seven per cent with power industries and domestic consumption accounting for 82 per cent.

Gas demand already displays seasonal pattern with national demand growing in winter beyond transmission capacity. Therefore, supplies to large users mainly industries and power plants are curtailed during winter months to ensure supplies to domestic, commercial and small industries. Annual production at present is about 1. 16 TCF. 10. The country may plunge into energy crisis by the year 2007 due to rising electricity demand which nters into double digit fgure following increasing sale of electrical and electronic appliances on leasefinance, it is reliably learnt Thursday. The country may face energy crisis by the year 2007 following healthy growth of 13 per cent in electricity demand during the last quarter, which will erode surplus production in absence of commissioning of any new power generation project during this financial year," informed sources told The Nation. 11. As per Pakistan Economic Survey 2003-04, electricity consumption has increased by 8. 6 per cent during first three-quarter of demand surged up to 13 per cent during last quarter. The survey said household sector has been

the largest consumer of electricity accounting for 44. per cent of total electricity consumption followed by industries 31. 1 per cent, agriculture 14. 3 per cent, other government sector 7. 4 per cent, commercial 5. 5 per cent and street light 0. 7 per cent. 12. Keeping in view the past trend and the future development, WAPDA has also revised its load forecast to eight per cent per annum as against previous estimates of five per cent on average. Even the revised load forecast has also failed all assessments due to which Authority has left no other option but to start load anagement this year, which may convert into scheduled load shedding over a period of two year, sources maintained.

The country needs a quantum Jump in electricity generation in medium-term scenario to revert the possibilities of load shedding in future due to shrinking gap between demand and supply of electricity at peak hours. 13. According to an official report, the gap between firm supply and peak hours demand has already been shrunk to three digit (440 MW) during this fiscal and will slip into negative columns next year (-441 MW) and further intensify to (-1 , 457 MW) during the financial year 2006-07.

The report maintained that the difference between firm supply and peak demand is estimated at 5, 529 MW by the year 2009-10 when firm electricity supply will stand at 1 5, 055 MW against peak demand of 20, 584 MW. 14. Chairman WAPDA Tariq Hamid at a Press conference early this year warned about the possible energy crisis and stressed the need for 'quantum Jump' in power generation. The experts say it could only be possible through a mega

project of hydropower generation, otherwise the gap between firm supply and peak demand will remain on the rise.

They said the power generation projects, which are due to ommission in coming years are of low capacity and will not be able to exceed the surging demand of the electricity. 15. They say no power generation project will commission during this fiscal year and the total installed capacity of electricity generation will remain 19, 478 MW to meet 15, 082 MW firm supply and 14, 642 MW peak demand. Giving details of projects, the sources said Malakand-lll (81 MW), Pehur (18MW) and combined cycle power plant at Faisalabad (450MW) are planned to be commissioned during the year 2007.

Mangla Dam raising project would also add 1 50 MW capacity to the national grid by June 2007. Besides this, Khan Khwar (72MW), Allai Khwar (121 MW), Duber Khwar (130MW) and Kayal Khwar (130MW) are expected to be completed in 2008 along with Golan Gol (106MW) and Jinnah (96MW). Moreover, Matiltan (84MW), New Bong Escape (79MW) and RaJdhani (132MW) are expected by 2009 while Taunsa (120MW) is likely to be completed by 2010. Sources say WAPDA has also planned to install a high efficiency combined cycle power plant at Baloki (450MW), which is expected to be completed by 2010.

In addition of these, power plant 1 & 2 of 300 MW each at Thar Coal with the assistance of China are also lanned for commissioning in 2009, sources said. Moreover, efforts are also under way with China National Nuclear Corporation for the construction of a third nuclear power plant with a gross

capacity of 325 MW at Chashma, they added. 23. RECOMMENDATIONS that is generally considered feasible for tropical and equatorial countries.

Even though the accepted standard is 1, 000 W/m2 of peak power at sea level, an average solar panel (or photovoltaic ” PV ” panel), delivers an average of only 19-56W/m2. Solar plants are generally used in cases where smaller amounts of power are required at remote locations. PV is also the most expensive of all options making it less attractive. b. Industrialization around the world has taken place because of the abundance of reliable and cheap electrical power (infrastructure, human resource and government incentives follow).

Reliable and cheap availability of electric power in Pakistan will lead to large-scale investment in industry, creation of Jobs, elimination of unemployment andpoverty, greater manufacturing and exports, trade surplus and the reduction of deficits. It will lead toa prosperous Pakistan. c. Smaller windmills are also very feasible for remote villages, and in desert, mountainous and oastal regions, cutting down on the cost of power transmission and distribution networks. In remote farmlands, they have been successfully used for decades in the United States and Europe d.

The supply of natural gas in Pakistan has been depleting over the years, and the country is now looking at the option of importing gas from Qatar and Central Asia. This leaves the possibility of exploring nuclear, coal and other alternative energy sources. e. Nuclear energy and coal form the lowest source of power production in Pakistan. On the other hand, the world average for nuclear energy is 16 per cent and for coal 40 per cent. There

have been alarming predictions by groups such as the Club of Rome that the world would run out of oil in the late 20th century.

CONCLUSION 24. Althoughtechnologyhas made oil extraction more efficient, the world is having to struggle to provide oil by using increasingly costly and less productive methods such as deep sea drilling, and developing environmentally sensitive areas such as the Arctic National Wildlife Refuge. The world's population continues to grow at a quarter of a million people per day, increasing the consumption of energy. The per capita energy consumption of China, India and other developing nations continues to ncrease as the people living in these countries adopt western lifestyles.

At present a small part of the world's population consumes a large part of its resources, with the United States and its population of 296 million people consuming more oil than China with its population of 1. 3 billion people. Efficiency mechanisms such as Negawatt power can provide significantly increased supply. It is a term used to describe the trading of increased efficiency, using consumption efficiency to increase available market supply rather than by increasing plant generation capacity.