MANAGING ENERGY DEMAND - THE NEW GLOBAL ENERGY PARADIGM

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The Applied Economics Research Center of the University of Karachi organized a one-day seminar at its campus on "Managing Energy Demand – the New Global Energy Paradigm" in September 2006. Chairman HEC, Dr. Atta-ur-Rehman was the Chief Guest.

In her welcome address Director AERC, Dr. Shahida Vizarat, outlined the major achievements of AERC in academic and research work during the previous calendar year.

This was followed by an address by Dr. Farman Fatehpuri, Dean Faculty of Arts, University of Karachi. Dr. Fatehpuri said that all developing countries are currently hit by a severe energy crisis and Pakistan is no exception. He emphasized the importance of renewable energy resources as fossil fuel reserves are bound to run out. He held that Pakistan is very rich in solar energy but, unfortunately, we have not been able to tap into this resource very effectively.

Dr. Atta-ur-Rehman said that wind can be a huge source of energy in Pakistan. He said that during his tenure as Federal Minister of Science and Technology, he instructed the Met Office to develop Pakistan's wind map. It was discovered that there exists a wind tunnel from Keti Bunder to Gharo which has enough potential to produce ten thousand mega watts of energy. Water is another substantial source of energy. While he acknowledged that solar power has potential, he stressed that major problems exist such as the exorbitant cost of solar cells and very low efficiency. He said that biofuels like bioethanol, biobutanol and biodiesel produced from biomas are renewable energy resources. In the short-term, he emphasized, that Pakistan should expand its nuclear energy production, as the supply of uranium in Pakistan is substantial. He said that the ultimate goal, within the next twenty to thirty years, should be the rapid development of nuclear fission. This would give Pakistan an almost inexhaustible source of energy that would be very environmental friendly.

Samina Khalil of AERC presented a paper on "Managing Energy Demand – the New Global Energy Paradigm – the Context of Pakistan." She said that almost sixty percent of all energy produced in the world is from oil and coal. Only eleven percent is from renewable resources. In Pakistan, she said, sixty-five percent of all energy is supplied from commercial energy sources like oil and gas, while, thirty-five percent comes from non commercial sources like biomas. A salient feature in Pakistan's energy consumption pattern has been a shift towards natural gas from oil. The key factors in this increase are lower cost and increased availability of natural gas. She said that thirty-one percent shortage is expected in Pakistan's energy supply in the near future that is bound to put pressure on the balance of payments. She criticized the energy policy in Pakistan as lacking focus. She said that the solution to Pakistan's energy problems could be effective demand management, improving energy efficiency, reducing KWH of power demand, and reducing power demand at consumer level. She said that demand and supply management (DSM) programs have a three-pronged approach: conservation programs, load management programs, and strategic load growth programs. She stressed that the support for DSM would come from society although industrialists and traders will always oppose it. She concluded by citing the example of ENERCON, which is a firm specializing in demand side energy management. She outlined various services provided by ENERCON that can greatly help the overall energy situation of Pakistan.

Shaista Alam, also of the AERC, presented her paper titled, "Sustainable Development in Pakistan in the Context of Energy Consumption Demand and Environmental Degradation." She said that human-induced environmental degradation is the most troubling and complex global issue facing the world as a whole. She said that economic activity creates wealth but has negative effects on the environment. Her study focused on the linkage between environmental degradation and economic growth. She tried to relate demographic factors to environmental degradation. She presented a model relating factors like population, urbanization, energy intensity and economic development etc. to per capita carbon dioxide emission in Pakistan. The study was based on annual data covering the time period 1971 to 2005 for Pakistan. The model showed that one percent increase in GDP causes an increase of 0.84% in carbon dioxide emissions in Pakistan. Similarly, one percent growth in urbanization increased carbon dioxide emission by 0.55%. Shaista Alam concluded that inefficient use of energy would not lead Pakistan towards sustainable development in the near future. She recommended that Pakistan should protect and preserve its own natural resources. She emphasized the need for increased forestation and a more diversified energy production system. She said that energy consumption could be reduced by a change in lifestyle.

This was followed by a presentation by Saleem Arif, GM Planning (Power), WAPDA, Lahore. He stated that provision of quality power supply will improve QWL and increase efficiency. He said that the demand for energy under the WAPDA served areas has increased by 9.78% over the last five years, while, under the KESC covered areas it has increased by 5.92% over the same period. In Pakistan 83.1% of all electricity users are residential consumers. In China and India the bulk of usage is for industrial purposes. Pakistan is the only developing country, he said, where in the 1990s industrial usage declined continuously. The load forecasts made by WAPDA suggest that Pakistan

would require an increase of six thousand mega watts to its energy production by 2010. He mentioned that for the previous ten years, no thermal powerhouse had been established in the public sector due to the IPP agreements of the Benazir government. Pakistan's installed capacity of 17350 MW is disappointing as countries like the United States, Japan, and China have installed capacitates of 700,000 MW, 225,000 MW, and 380,000 MW respectively. He said that Pakistan would undertake continuous expansion of its infrastructure during the next five years. By 2010-2011, the installed capacity would be 25,000 MW. He dismissed wind as a possible source of energy because of the dependence on the wind speed for efficient production. He warned that electricity prices would continue to rise due to an increase in fossil fuel prices. He mentioned that government has planned to build five dams. He showed disappointment that, despite being called the most researched project in the world by the World Bank, Kalabagh Dam has not materialized due to political reasons. He criticized the massive expansion in the sale of consumer appliances that have increased the domestic unproductive usage of electricity.

The last presentation was by Dr. Arif Kazmi of the HEC. His spoke on "New Approaches in Search of Clean and Renewable Energy Resources: An Introduction to Hydrogen Economy." He said that a hydrogen economy is a hypothetical future economy in which energy, for mobile applications (vehicles, aircraft) and electrical grid load balancing (daily peak demand reserve), is stored as hydrogen (H_2). He said that a hydrogen economy is required in order to solve the ill effects of using hydrocarbon fuels. In a hydrogen economy, hydrogen fuel would be manufactured from (mostly) renewable energy sources and feedstocks, replacing gasoline, kerosene, and diesel fuel for transportation. Any carbon-containing energy sources used in the manufacture of the hydrogen would be sequestered on site (carbon capture). The end use of the hydrogen would be via direct combustion or by fuel cell burning (producing only water vapor, and no greenhouse gases). He said that hydrogen production is a large and growing industry. He said that despite major interest in hydrogen economy, there are various hurdles to be overcome before its successful implementation.