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Exploring Efficient Power Generation Pathways for Pakistan

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Abstract—This study suggests a best possible and efficient power generation pathway for Pakistan for the period 2018-2037. Multiple future scenarios were developed in Low Emissions Analysis Platform (LEAP) software which includes Reference (REF), Energy Efficiency and Conservation 1 (EEC1), Energy Efficiency and Conservation 2 (EEC2), and Energy Efficiency and Conservation 3 (EEC3). The REF scenario follows government's existing plans and policies. In EEC1, EEC2, and EEC3 scenarios the replacement of 30%, 60%, and 100% of non-efficient appliances with energy-efficient appliances has been considered respectively. The results reveal that EEC1, EEC2, and EEC3 reduce demand by 13.47%, 31.96%, and 49.45% respectively; thereby decreasing the investment cost required for the additional electricity and reduces CO^2 emission by12.62, 23.25, and 36.38 million tons respectively. It is concluded from this study that energy efficiency and conservation could be considered as potential energy sources to reduce the need for electricity supply.

Keywords—Electricity Demand, Electricity Supply, Energy Efficiency and conservation, LEAP Model, Energy Saving