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The Current Situation and Perspectives of Electricity Demand and Estimation of Carbon Dioxide Emissions and Efficiency

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Abstract : This article presents a current and future energy situation in Libya. The electric power efficiency and operating hours in power plants are evaluated from 2005 to 2010. Carbon dioxide emissions in most of power plants are estimated. In 2005, the efficiency of steam power plants achieved a range of 20% to 28%. While, the gas turbine power plants efficiency ranged between 9% and 25%, this can be considered as low efficiency. However, the efficiency improvement has clearly observed in some power plants from 2008 to 2010, especially in the power plant of North Benghazi and west Tripoli. In fact, these power plants have modified to combine cycle. The efficiency of North Benghazi power plant has increased from 25% to 46.6%, while in Tripoli it is increased from 22% to 34%. On the other hand, the efficiency improvement is not observed in the gas turbine power plants. When compared to the quantity of fuel used, the carbon dioxide emissions resulting from electricity generation plants were very high. Finally, an estimation of the energy demand has been done to the maximum load and the annual load factor (i.e., the ratio between the output power and installed power).

Keywords : power plant, efficiency improvement, carbon dioxide emissions, energy situation in Libya
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