

Energy Auditing: Towards Energy Balance for Qatar Vision 2030

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Qatar has high increasing electrical energy demand, from less than 50MW 1954 to 5,250MW in 2010. Electrical energy generating was only 1,500MW in 1995, 4,535MW in 2009, and soon will be 9,000MW. The expected additional capacity needed by 2016 is 5,500MW with high average emission CO₂ of 32 tons/capita/year.

Qatar has strong solar energy potential, (2070-2250)kWh/m²yr, which could takes place to fulfill the future need energy balance towards Qatar Vision 2030. The mean hourly, daily, monthly and yearly solar irradiation data measured on ground and by satellite collected for several cities such as: Doha, Dukhan, Al-Khor, Ruwais, Abu-Samra, Al-Utoriyah, and Rodhat Al-Faras have been investigated. The measured data on ground is compared with the satellite's data. This preliminary investigation and data analysis could be good preliminary design for "Qatar Solar Atlas".

The electrical energy consumption breakdown by sectors: residential, commercial, government, industrial, and the total consumption through (2007-2009) are studied. The residential sector is the highest consumption 35 % while the industrial sector uses less. Residential villa consumes three times residential flat. This sector needs energy auditing to save energy in A/C and lighting energy.

The objective of this research is to assist and lead the authority and government to the energy roadmap, energy footprint, Qatar solar atlas, and energy policy to secure energy future with minimizing energy demand and presenting the solar energy potential.

In this research the energy demand and energy forecasting for the nearest future to achieve Qatar Vision 2030 are presented. The energy required to be installed is addressed with emphasize on the solar energy potential with gradually application using mature and proven solar technology. Several scenarios to present Qatar forecasting electrical power demand to 2024 as base case, low and high expected values is presented. The peak expected load through 2022 world football club is considered.