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Abstract

The commercial sector accounts for 8.6% of total [electricity consumption](#) of India and increasing with 5% rate annually due to rapid urbanization. The building's major energy consuming end-uses are [air-conditioning](#) including heating, cooling, lighting, and equipment. The development and implementation of energy efficiency codes and measures will provide sustainable future. The development process requires analyses of current building construction and operation practices. The current building construction practices can be analyzed by developing reference buildings representative of national building stock. In this research, the development methodology of reference building, developed reference office buildings for India and its application have been presented. The reference buildings are developed for low-rise and high-rise office buildings with 8-h and 24-h operation based on data collection of 230 buildings constructed in last ten years. This methodology can be applied to other buildings types for development of reference buildings with the appropriate data. From the analyses of reference buildings, it has found that the primary [energy conservation measures](#) would be [envelope thermal](#) properties for 8-h operational buildings while internal loads (occupancy, lighting, and equipment) in 24-h operational building. The energy performance index (EPI) of reference office buildings are better than ECBC 2017. Besides, some of the minimum requirements have not met. The lighting and glass specifications of reference buildings are better than ECBC level due market and government policies while HVAC system specially [chiller](#)COP and its controls are needed to be improved.

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