

**Topic:** Study of Variables Affecting Electricity Consumption and Greenhouse Gas Emission of Hotels in Thailand

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### **ABSTRACT**

The hotel sector accounts for significant environmental impacts in terms of resource consumption and pollution. This study aims to estimate greenhouse gas emissions from hotel electricity consumption in Thailand. Data were collected from 187 hotels recorded in the list of the Royal Decree on Designated Buildings, B.E. 2538 of the Energy Conservation Promotion Act, B.E. 2535, Thailand. The complete data sets for the year 2011 were received from 63 hotels (33.69%) which were classified as large commercial hotels. The nine physical hotel parameters and four operational hotel parameters were collected from the sampled hotels by questionnaires. The factors affecting electricity consumption of hotel in Thailand were investigated by Pearson correlation. The results indicated that the electricity consumption intensity was 26.82 kWh/m<sup>2</sup>/month, 2,934.20 kWh/guest room/month and 191.03 kWh/room-night/month. The carbon emission intensity was 14.69 kgCO<sub>2</sub>/m<sup>2</sup>, 1,607.06 kgCO<sub>2</sub>/guest room and 104.63 kgCO<sub>2</sub>/room-night. Among all factors, the number of workers was the most significant factor affecting electricity consumption in units of kWh/m<sup>2</sup> at a 99% confidential level. The predictive models were then proposed and used to explain the relationship between electricity consumption and hotel parameters. The impacts of six mitigation measures for the reduction of GHG emission from electricity consumption of hotels in Thailand were evaluated by expert scoring method. Among all measures, hotel staff management was the most appropriated mitigation for energy conservation and GHGs reduction by hotels in Thailand.

**Keywords:** electricity consumption, greenhouse gas emission, hotels, Thailand, correlation, regression analysis