

An Analytical Approach to Establish Specific Electrical Energy Consumption for Tea Factories in Sri Lanka

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Abstract

Tea industry is undoubtedly one of the most important industries with a substantial contribution to the national economy in Sri Lanka. Tea industry utilizes energy in the forms of thermal energy and electrical energy for its tea manufacturing process requirements. Analyze values that can be used as standard values for the comparing performance of industries, process, systems or equipments is essential to set the corresponding achievements. Average value, best value and baseline for electrical energy consumption for tea industry is a vital because the specific electricity consumption in terms of kWh per one kilogram of made tea is a good measure of understanding the effectiveness of electricity utilization in the tea industry. This research contributes to calculate the specific electrical energy consumption for tea factories in Sri Lanka because the calculated value of the specific energy consumption between the tea factories has large variation. There are 642 tea factories are operated in Sri Lanka. These tea factories are situated up country, mid country and low country respectively. From those tea factories 50 tea factories are taken as the sample size. From the above sample size about 25 tea factories, data are collected from up country/ mid country tea factories and other 25 tea factories, data collected from low country tea factories. Questionnaire survey was carried out for collecting relevant data from the tea factories and gathered information on monthly and annual made tea production (kg) and monthly and annual electricity consumption (kWh). Specific electrical energy consumption (kWh per kilogram of made tea) was the calculated data. Minitab software system was used to find out the best performance among a group of tea factories. The calculated average value was 0.7856 kWh per one kilogram of made tea for specific electrical energy consumption and it is named as the baseline of specific electrical energy consumption. The best case of the specific electrical energy consumption is 0.4 kWh per one kilogram of made tea. This calculated baseline for the specific electrical energy consumption allows the tea factories to know precisely where their operation ranks in relation to a direct competitor, further allowing it to identify major performance gap that need to be addressed through improved energy efficiency.

Keywords: Baseline, best value, specific electrical energy consumption, tea production