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Energy savings measures for clinker production in cement industry

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Abstract. Industrial development has lead to higher energy consumption, and emission of greenhouse gases. Cement industry plays an important role in energy consumption and overall greenhouse gases emissions. This paper reviews the preceding studies concentration on the provision of energy saving, carbon dioxide emission reductions correlated with implementation of a number of technologies applicable to improve the energy efficiency in the cement industry. Energy efficiency measures for clinker production. It is found the largest amounts of thermal energy saving, electrical energy saving, emission reductions are 4.1 Giga Joule per ton, 35 kilo Watt hour per ton, 112,61 kilogram CO_2 per ton respectively.

Introduction

Industrial sector energy consumption varies from 30% to 70% of total energy [1,29,33-34,38-39]. The cement industry consumes a significant amount of natural resources and energy. As well as it contributes around the world to the evolvement and modernization of cities and infrastructure. The cement industry and its associations constantly try to improve environmental performance by optimizing the use of natural resources and reducing its overall energy consumption [46]. For that reason focus should be provided on the reduction of energy and energy related environmental emissions locally and globally [13,18,37,49].

Specific Energy Consumption

One of the most significant indicators to measure the efficiency of a cement plant is the specific energy consumption for the production of clinker in Mega Joule per ton clinker. Several different kinds of clinker kilns are available, with large differences in specific energy consumption and CO2emission intensity. The specific energy consumption varies from about 3.40 Giga Joule per ton for the dry process to about 5.29 Giga Joule per ton for the wet process. The best practice specific energy consumption in India is 3.06 Giga Joule per ton while in some countries of the world it is lower than 2.95 Giga Joule per ton [25,26,31]. Nevertheless, there are not many such a sector-specific studies in Thailand for the energy intensive sector like cement industry. In 2001, cement industry consumed about 16 % on the whole manufacturing energy consumption [10].