

Fly Ash in Cement Kilns: Green Practices Leading to Emissions Reductions

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ABSTRACT

As one of the largest cement manufacturers in North America, Holcim (US) understands its responsibility to provide a sustainable future to the world in which we live. To do this, Holcim is working to reduce the carbon dioxide-intensity of production processes and product use through use of waste products, i.e. fly ash from power generation, and other industrial wastes.

Holcim uses fly ashes that have specific technical and chemical requirements to reduce carbon dioxide through:

- 1) **Clinker factor reduction**—The clinker factor is the percentage of clinker in cement. Lowering the clinker factor reduces the amount of fuel required per ton of cement produced. Substituting the clinker with fly ash reduces the volume of virgin raw materials required.
- 2) **Waste co-processing**—Substitution of fuels and raw materials with alternatives, is an important eco-efficiency driver because it reduces carbon dioxide emissions and use of natural resources. These alternatives offset traditional materials thus conserving non-renewable natural resources and allowing for the recovery of both energy and material from selected waste, a step called co-processing.

The paper describes the main characteristics of fly ash use in cement, ranging from the characteristics of the cement kiln which provide optimal conditions for co-processing, to the technical challenges of handling, to the legal frameworks and issues of social acceptance. This will be exemplified in various practical examples from the United States giving insight into the business reality of fly ash use in the cement industry in recent years.