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ITAS-Project

Co-firing of Secondary Fuels in Cement Kilns

Project description

The manufacture of cement clinker is an energy-intensive process. The high share of energy costs in production costs of cement and the steadily increasing international competition has intensified the cement industry's efforts to reduce energy costs. Therefore, the use of waste as low-cost secondary fuel is increasingly important for the cement industry. However, with the growing use of secondary fuels, forces the cement plants into a competition with thermal waste treatment facilities. Further on, the effect of the increased contamination of the cement clinker by the use of secondary fuels has its quality is not clear. Therefore, the use of waste as alternative fuel in the cement industry is subject of controversies in professional circles, politics and parts of society.

The aim of this work is to summarise the present knowledge on the co-incineration of waste in the clinker manufacturing process. In a first step different processes for clinker production are described. In Europe, especially in Germany, the most relevant process for clinker production is the dry process. In this process rotary kilns with mainly multi stage suspension preheaters with or without precalciners are used. In Germany these kilns have a share of approximately 85 % in the total clinker capacity.

Afterwards, the distributions and interrelationships of heavy metals introduced through raw materials and fuels are performed. The heavy metals are either directly retained in the clinker depending on the volatility of the metals or incorporated into the fly ash which is grinded with clinker during cement production.

In a further step the clinker production capacities for Germany (sites, kind of preheater kiln, capacity) for the beginning of 1999 were collected and - due to observance of secrecy - presented in an aggregated form. Additionally, the type and amount of secondary fuels (kind and amount) which could be used due to official approvals are evaluated and compared with amounts really used. In all plants which have a permission for a co-incineration of secondary fuels, 45 % of the energy consumption could be met by using them.

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