

Co-firing of Biomass in European Coal-fired Power Plants. Drivers, Experiences and Projects

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Abstract

In this paper the operational experiences of direct and indirect co-firing of biomass and waste in European coal- and natural gas-fired power plants are addressed. As a result of renewable energy policies, CO₂ emission-reduction targets, tax incentives and new legislation with respect to waste disposal, imposed by both the national- as well as the EU-government, power (co-)generation from biomass, waste and recovered fuels is a major topic for the power generation sector in most European countries. The operational experiences of direct co-combustion activities in coal fired power plants are reviewed and an overview of European indirect co-combustion activities is presented. The technical, environmental, and economic feasibility of different indirect co-combustion concepts (i.e. upstream gasification, pyrolysis, combustion with steam-side integration) is reviewed. Main technical constraints that limit the co-combustion capacity of biomass and waste in conventional coal fired power plants are: the grindability of the biomass/coal blend, the capacity of existing unit components, and the risk of severe slagging, fouling, corrosion and erosion. The main environmental constraints that have to be taken into account are the quality of produced solid waste streams (fly ash, bottom ash, gypsum) and the applicable air emission regulations.