

Kangas, H.-L., Lintunen*, J. & Uusivuori, J. 2009.

The cofiring problem of a power plant under policy regulations

Energy Policy 37(5): 1898–1904

doi:10.1016/j.enpol.2009.01.028

Abstract

Cofiring of fossil and renewable fuels can contribute to reaching tightening climate and renewable energy goals. The increase in biomass share in cofiring decreases the use of fossil fuel and increases renewable energy production. We study how energy and climate policies promote that increase. First, we present and solve an electricity producer's profit-maximization problem with detailed technical description of cofiring. We then study the effectiveness of policy instruments (e.g. feed-in laws and emission trading) on biomass utilization in cofiring. The study offers a novel approach to explore the cofiring problem, because of the endogenous fuel choice combined with the policy analysis. We study two different power plants that are located in two different European electricity market areas. Our analysis shows that both feed-in tariff and feed-in premium can have unexpected weaknesses, when they are introduced together with emission trading. Therefore decision-makers should be well informed and cautious when introducing these policies.

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The article was published by Elsevier Ltd.