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THERMAL SCIENCE

International Scientific Journal

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PROSPECTS FOR CO-FIRING OF CLEAN COAL AND CREOSOTE-TREATED WASTE WOOD AT SMALL-SCALE POWER STATIONS

ABSTRACT

If a small-scale clean coal fueled power plant is co-fueled with 5% of creosote-treated used-up sleeper wood, the decontamination by carbonisation at 500°C in an indirectly heated rotary kiln with the diameter 1.7 m and effective length 10 m can be realised. It should be included in the "3R-Carbonisation Plant" system, which processes coal. It will improve the heat balance of the system, since the carbonisation of wood will deliver a lot of high calorificity pyrolytic vapour to the joint furnace of the "3R-Carbonisation Plant". Pine wood sleeper sapwood contains 0.25% of sulphur, but the average pine sleeper wood (sapwood and heartwood) 0.05% of sulphur. Most of the sulphur is lost with the pyrolytic vapour and burned in the furnace. Since the "3R-Carbonisation Plant" is equipped with a flue gases cleaning system, the SO₂ emission level will not exceed 5 mg/m³. The charcoal of the sapwood portion of sleepers and that of the average sleeper wood will contain 0.22% and 0.035% of sulphur, respectively. The increase of the carbonisation temperature does not substantially decrease the sulphur content in charcoal, although it is sufficiently low, and the charcoal can be co-fired with clean coal. The considered process is suitable for small power plants, if the biomass input in the common energy balance is 5 to 10%. If the mean distance of sleepers transportation for Central and Eastern Europe is estimated not to exceed 200 km, the co-combustion of clean coal and carbonised sleepers would be an acceptable option from the environmental and economic points of view.

KEYWORDS

[co-combustion](#), [clean coal](#), [railway sleepers](#), [carbonization](#), [charcoal](#), [creosote-treated wood](#)

PAPER SUBMITTED: 2005-05-25

PAPER REVISED: 2006-03-07

PAPER ACCEPTED: 2006-03-14

CITATION EXPORT: [view in browser](#) or [download as text file](#)

THERMAL SCIENCE YEAR 2006, VOLUME 10, ISSUE 3, PAGES [109 - 118]

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