Distribution of Hg and As in the process of lignite and subbituminous coals combustion in the pulverised and fluidized bed reactor

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The reaserch aims to determine the distribution of Hg and As in the process of lignite and subbituminous coals in a pulverised bed reactor and assess the impact of the post-treatment on speciation and emissions of Hg and As into air.

The results of the research will be used to develop regression models and artificial neural networks models, which will give the ability to continuously monitor the concentrations of Hg and As in the flue gases leaving the installation, based on the information about the fuel and combustion conditions.

In the case of Hg emission limits exceedance, this tool will allow taking actions to recover the desired concentration levels of Hg and As in gases emitted into the atmosphere.

Additional methods of post-treatment (dedicated only for Hg or As) can be used optionally, but not as a continuous unit.

To verify the targets, an existing database for mercury (data regarding the distribution of Hg between the various coal combustion products, the content of Hg in Polish coals and their chemical composition, the influence of flue gas cleaning methods on the Hg speciation) will be used.

The measurements been taken on Polish power plants operating on bituminous coal and lignite and supplemented with denitrification systems, dust collection and flue gas desulfurization. The analysis been carried out for a typical block of 370-390 MW and 858 MW lignite-powered units for the boiler and a block of 370-390 MW dust coal-powered boiler.