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Co-Processing of Biomass and Coal

The coal industry is one of the basic economic branches of Ukraine. It is known that coal - the integral component of electric power industry and metallurgy. Coal takes of the second position after oil and considerably advances natural gas.

Despite low cost of coal in comparison with natural gas and furnace fuel, the use of coal as fuel for energy development gives many problems. Basically, the main drawback of fossil fuels is pollution, gaseous and firm (ashes).

Practically organic waste of industrial and agricultural manufactures (straw, wood sawdust, wood chips, household garbage, sunflower husks and etc.) is not used. Their application in heat power installations would give the chance to reduce essentially consumption of such expensive kinds of fuel, as coal, fuel oil or natural gas. The renewable energy is becoming more and more popular in the world, especially in power scarce countries. For Ukraine which imports 75 % of necessary volume of natural gas and 85 % of crude oil and oil products, transition to the alternative sources of energy is extremely urgent.

Ukraine has enough high potential for biomass manufacture. Experts estimated that biomass (excluding the share which uses other sectors of the economy) can provide about 8-10% of the total demand for primary energy. The use of such biomass is equivalent to increasing the domestic production of fuel by 20%.

By 2030, 9-12 % of primary energy carriers in Ukraine can be covered by biomass. More than half of biomass is produced in agriculture: cereal straw (23%), stems, cabbage corn (10%), stalks and husks of sunflower (10%), biogas from manure (7%), biodiesel, bio-ethanol (9%).

One of the modern technologies, providing a significant reduction of emissions, is co-firing of not very high-grade coals and solid fuels from biomass.

The disadvantage of burning coal is its high ash content; a drawback of biomass burning is fast bulk area.

There are several ways of co-firing of coal and biomass: direct co-combustion, indirect co-firing, and the parallel burning.

Direct co-firing means the simultaneous preparation, grinding and charging of coal and biomass to the boiler. Indirect co-firing of coal includes separate preparation and grinding of biomass. Parallel co-firing includes burning of coal and biomass in individual boilers.

Further studies will investigate jointly-oxidative pyrolysis; evaluate the quality of fuel which can compete with fossil fuels. In jointly use of biomass and coal, the main task is to reduce fuel consumption.