

The results achieved by University "Constantin Brancusi " of Targu-Jiu (UCB) in Phase I of the project (2016) are:

1. In the context of the work specified in the project plan for this stage, the UCB's activities pursued the evaluation of the ash and slag generated by power plants from Oltenia, with a focus on two representative power plants: Turceni PP and Govora PP. Four distinct sources of heavy ash were targeted, two sources represented by the large deposits (Valley Ceplea - Turceni, Stack 4 of deposit Govora) and two operating sources at the time of sampling (Boilers 5 and 7 of the plant thermoelectric Govora).

The report presents a comparative study between the two power plants focusing on the scheme of power plants, steam boilers, fuel, ash and slag landfills.

Lignite samples were taken from the coal delivered by three careers, namely: Berbești (delivered at Govora PP), North Jilt (delivered at Turceni PP) and Rosia (delivered at Rovinari PP). Technical analyzes were performed and elemental analysis and calorific value were determined for three lignite samples from each source. Characteristics of lignite samples are presented both in tables and graphs, and test reports are attached. The methods and apparatus used for analyzing samples of lignite are presented in the report.

2. Depending on the operating efficiency of combustion installations from the large power plants, heavy ash discharged contains unburned carbon in a significant percentage, which under certain conditions can be considered as a source of residual organic matter with a high potential capitalization.

To highlight this aspect, 350 incremental samples of ash and slag were collected from Turceni and Govora landfills. The incremental samples of ash and slag have undergone laboratory testing to determine the moisture, bulk density and grain size distribution (particle size composition). The report presents the methodology and apparatus used for physical characterization. 35 cumulative samples of ash and slag from Ceplea Valley (Turceni) and 5 cumulative samples of ash and slag from Govora landfill were sent to a project partner -Polytechnic University of Bucharest (UPB) - for complex characterization. Cumulative average samples which contain higher proportions of residual carbon were separated by size fraction and they were sent to the University of Porto (UP) for further analysis.

The report shows how the samples from Turceni and Govora were composed on size fractions, the results of physico-chemical characterization and the percentage of residual carbon by particle size.

3. Information on history of operation in Romanian graphite industry is provided. A set of natural graphite samples, taken from Baia de Fier, was analyzed and prepared complex characterization. Three types of samples were sent at two partners (UP and UPB): ore, crushed ore and graphite separated by flotation.

4. A literature review was elaborated regarding the main processes used for unburned carbon separation from ash and slag.

As noted in the report, the main finding is that the majority of unburned coal is found in fractions greater than 0.5 mm dimensions, sieving being the first stage of concentration. It has also been observed that the bulk density of the dimensional fractions increases with decreasing particle size , hence the conclusion that the gravimetric and flotation methods can be effective. To verify this hypothesis, simple tests - flotation in water (with and without air insufflation) - have been performed.

Concentrated unburned coal was subjected to technical analysis and the results are presented in tables.

The two activities (methods of concentration of unburned coal and its analysis) will be developed in the second phase of the project.

5. To evaluate the mineral residue obtained after unburned coal separation, in this preliminary stage of the works, it was tested the usability of dimensional fractions less than 0.5 mm obtained by sieving the ash and slag, mass in which unburned coal is very low and therefore reused as such.

In the experimental work, fine fraction of ash was used as raw material to obtain materials through two types of technologies: hot bonding ceramic products (crushed and burned) and cold hydraulic binding (concrete based hydraulic binder).

Materials, methods of specimens molding and results are presented in detail in the report.

6. As UCB already had the necessary laboratory equipment, only the supplies necessary for carrying activities were purchased in the project,. Acquisitions followed the legal procedures and UCB internal procurement rules.
7. The report briefly presents the results of the project team participation at the kickoff meeting, organized by the Project coordinator at Porto (Portugal). 13 representatives from five participating countries: Portugal, Romania, Poland, Argentina , South Africa attended the kickoff meeting. They were mentioned: each partner's specific problems related to project activities, the timing of samples distribution and parameters for conducting experiments, the necessary samples, what samples will prepare each partner, their quality requirements.
8. The project's web page has been created on the website of the University "Constantin Brancusi 'of Targu Jiu, at: <http://www.utgjiu.ro/charphite/>. The main information and the results achieved so far by Romanian partners (UCB and UPB) are presented.