Project name, IRN	**AP23488517** – Development of technology for complex processing and utilization of dust from crushing and fractionation of high-carbon ferrochrome
Completion date	01.09.2024-31.12.2026
Project supervisor	Sariyev Otegen, Can. Tech. Scien., associated professor
Report	The state of disposal, use and neutralization of industrial waste in the region continues to be unsatisfactory. In 2023, industrial waste management in the region did not improve, out of 24.0 million tons of waste generated, only 12.0 million tons were used and neutralized. The main reasons for the accumulation and unsatisfactory recycling of waste in the region: - at the largest industrial enterprises of the region, production is carried out using outdated technologies with high waste generation, their technically sound warehousing and storage is not organized (waste is mixed not only of different chemical composition, but also of a hazard class), which does not allow them to be efficiently processed in the future; - industrial waste of the 3rd hazard class is exported to urban landfills by enterprises along with household waste, which creates conditions for waste gorenje and does not allow them to be used in the future to obtain useful products.; - practically all enterprises of the region unreasonably neutralize spent pickling solutions and acids with lime, which does not ensure the production of commercial products and leads to environmental pollution; - there are practically no landfills in the region, and the storage of solid waste in landfills leads to their gorenje and pollution of the environment and complicates their processing; - the amount of insufficiently treated and untreated wastewater discharged into reservoirs remains high and depends mainly on the use of outdated technological processes at wastewater treatment plants for wastewater treatment. Full-fledged processing of many industrial and household waste is not only economical, but also significantly improves the environmental situation and significantly reduces the consumption of natural raw materials, as well as reduces the use of scarce land for waste storage. The introduction of new waste management technologies by enterprises will significantly accelerate the decision to improve living conditions, public health and the environment. The idea of the project is to recycle and recycle man-made waste - dust with a size class of "minus" 1 mm, accumulated from crushing and fractionation of high-carbon ferrochrome by cupping by briquetting and further electric furnace conversion to obtain from them chromium ferroalloys that are in demand on the market of metals and alloys for use in steel production. The resulting product will have an export-oriented character, which contributes to increasing the economic potential of the country.
Purpose	Ensuring the reuse (recycling) of dust from crushing in the production of commercial ferrochrome in order to benefit both from the point of view of environmental safety and economic feasibility.

Expected results	As a result of the planned research, technologies will be developed for briquetting metal dust with the required physico-mechanical and metallurgical properties and for smelting high-carbon ferrochrome from currently unused dust from crushing ferrochrome, which will increase the efficiency of the main production. This will be carried out by introducing a raw material, which is dust from crushing metal with an already recovered metal component with a low cost. The impact of the results of the project on the development of science and technology will be expressed in the fact that a new source of raw materials will be involved in the production process, which will improve the technical and economic performance of ferroalloy production and increase the environmental safety of the region adjacent to the dump territory. Upon completion of the project, it is planned to submit applications for regional, national or international competitions for the commercialization of research results. Also, such enterprises as TNK Kazchrome JSC (Aktobe and Aksu Ferroalloy plants), Mechel JSC (Chelyabinsk Electrometallurgical Plant, Serov Ferroalloy Plant), Klyuchevsky Ferroalloy Plant, Yildirm Group producing ferrochrome alloys can use the results of the study. The results of these studies will help solve the environmental problem associated with the use of man-made waste. Namely, the exploitation of useful areas and environmental pollution due to uncontrolled dusting and improves the environmental safety of the region. The reliability of theoretical calculations will be ensured by using reliable reference data and modern methods of planning experiments, and positive results will allow making correct conclusions from the results of experiments. The reliability of experimental results will be determined by the use of modern equipment during high-temperature experiments; high quality and accuracy of research equipment used in the analysis of experimental results, comparing the results obtained with data from other studies.
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Publications in scientific publications	-