

## 1. SUMMARY

Currently in the area of KGHM Polska Miedź S.A. “Legnica” Copper Smelter, copper is produced in the process of smelting copper concentrates in shaft furnaces. Also the return materials are processed in the copper processing line.

In order to process the growing stream of variable types of copper scrap the “Legnica” Copper Smelter plans to construct a new process line (a so-called Scrap Processing Plant) with a target copper volume of approx. 140,000 Mg/year. Apart from highest class scrap, the line will also be used for processing other cupriferous materials which so far have not been processed or processed only incidentally. The processes of recovery and production of new products in the Scrap Processing Plant will cover scrap containing copper, lead, zinc, tin, nickel and precious metals. Special emphasis in the technology under consideration will be placed on new cupriferous waste materials rich with precious metals, i.e. electrotechnical, electronic scrap, etc. The copper production technology will be based on scrap pre-processing operations and metallurgical processes occurring in scrap melting furnaces as well as in the electrorefining process. Processing of cupriferous scrap will be based on the preliminary sorting of scrap into groups according to the content of copper and contaminations, precise determination of the chemical composition and transferring selected materials to subsequent stages of the process, i.e. melting in the planned furnaces. The Scrap Management Base will be equipped with packing machines for packing scrap, scrap shredding equipment (rippers), including an iron and aluminium separation system, shearing machines, a scrap quality control station, an open and enclosed site for storing charge materials.

The pre-processed cupriferous scrap will be melted in the following basic copper processing units:

- TSL furnace,
- Maerz-type hearth-shaft melting furnace.

It is planned to install a TLA-type furnace which will be used to reduce converter slag coming from the TSL furnace and slag from the Maerz furnace. Fire-refining of converter copper produced in the TSL furnace and black copper from the Maerz-type hearth-shaft furnace will be conducted in the existing rotary anode PAO furnaces. Anode copper will be electrorefined in the electrorefining hall to be extended, equipped with new electrolyzers. A new electrolyte treatment node will be constructed in order to enable treatment of the increased amount of electrolyte.

The planned process devices and industrial facilities in the form of buildings and production halls will be localised only at premises to which the “Legnica” Copper Smelter has a legal title, namely in the area constituting the property of the State Treasury.

The perpetual usufructuary of these premises is KGHM Polska Miedź S.A. in Lubin. The only planned access road to the Scrap Management Base will be located on third-party plots.

Pursuant to the applicable legal regulations the planned cupriferous scrap pre-processing and melting nodes together with the accompanying facilities require development of an environmental impact report and must obtain a decision on environmental considerations.

The planned production of copper based on melting cupriferous scrap complies with the requirements of the Best Available Techniques. This technology by applying its solutions enables limiting the adverse impact of copper production on the environment.

The planned facilities and systems will be provided with the following protective measures limiting the influence of the planned undertaking on the environment:

- systems of efficient reduction of pollutant emissions to the environment,
- process gas afterburn chambers reducing emissions of substances containing organic

- carbon and carbon oxide,
- heat recovery by installation of waste-heat boilers,
- high-efficient fabric filters reducing concentration of dusts emitted to the environment to a maximum concentration of 5 mg/Nm<sup>3</sup> for the following process nodes:
  - cupriferous materials shredding and segregation,
  - melting scrap samples in laboratory furnaces,
  - TSL, Maerz and TLA furnaces,
  - local suction devices from TSL and Maerz furnaces,
  - slag crushing and dust pelletising,
  - dust storage tanks.
- TSL furnace flue gas wet treatment system by using a water and alkaline scrubber with a sodium carbonate solution reducing emissions of acid compounds,
- possibility of using further treatment processes on a fabric filter with an active carbon and calcium layer for process gases coming from the TSL furnace,
- gas burners with low emission of nitrogen oxides,
- returning the generated waste to the production process and its recovery or transfer outside the Copper Smelter for recovery or neutralisation,
- closed water cycles for furnace cooling,
- closed electrolyte treatment cycle in the extended electrolyte treatment and electrorefining node,
- equipping the planned systems and fans with thermal and acoustic insulation as well as soundproof housings reducing the noise emission,
- limiting vehicle transport of scrap to the Scrap Management Base only to daytime,
- hardening and concreting the area designed for the localisation of the planned facilities and installation of concrete pans under the furnaces, electrolyte and acid tanks.

Taking into account the land topography, the technical and engineering data of the updated undertaking, including the entire related infrastructure, the results of calculations and applicable regulations, the following conclusions can be drawn with regard to the environmental impact of the project:

### ***Air***

In the target situation, i.e. after shutting down shaft furnaces and commencing copper production only based on melting scrap and other cupriferous materials, the emissions of dusty and gaseous substances discharged to the environment by emitters of the Scrap Processing Plant will be considerably lower than it is at present. The structure of emitted dusts will change. They will contain much less arsenic and lead, but more copper, zinc and nickel.

In the target situation all the calculated parameters of immission of all the analysed substances are lower than the admissible values.

During the transition period, i.e. when the new production will be started up and raw material production (i.e. based on melting concentrates in shaft furnaces) will be gradually shut down (at first, in 2014 one of the shaft furnaces will be shut down, then till 2016 the next two) there will be temporary growth of emission of substances discharged to the environment, both in comparison to the present and target situation. In spite of the increased emission of substances during the transition period, the admissible air quality standards in the Copper Smelter will not be exceeded outside its premises to which it has legal title.

## **Waste management**

The copper production process based on cupriferous scrap melting will not generate any waste requiring storage. All the waste produced at individual production stages in the Scrap Management Base, the Scrap Melting Node and in the electrorefining process will be returned to the copper production process in the area of the Legnica Copper Smelter or transferred to external recipients for further management.

## **Protection against noise**

Implementation of the planned undertaking will not cause above normative levels of noise outside the premises administered by the Legnica Copper Smelter, provided that the following excessive noise protection measures are applied:

- enclosing in soundproof housings the exhaust fans of TSL, TLA and Maerz furnaces, as well as local suction devices of the furnaces located outside the industrial buildings as well as the installation of silencers,
- silent fans or enclosing in soundproof housings the exhaust fans of the gas dedusting system of the scrap shredding and separation process lines (PWB and Fe-Cu) located outside the industrial buildings,
- enclosing in soundproof housings the ripper-type scrap shredding equipment located inside the PWB and Fe-Cu shredding and sorting hall,
- installation of silent roof fans on the ventilation system of the Electrorefining Hall (the existing and extended one) and on the new Electrolyte Treatment Hall,
- installation of furnace blowers and fans on WTZ in rooms with high acoustic insulation walls – ferroconcrete walls + internal soundproofing of a room,
- scrap will be transported only in the daytime.

## **Water and sewage management**

The planned melting furnaces will be equipped with closed cooling water systems. The extended electrolyte electrorefining and treatment node will be equipped with a closed process sewage cycle. Process sewage will be redirected to electrolyte production cycles.

Process sewage generated in the new facilities (water from the closed cycle blowdown process, washing floors and from the wet gas treatment) and rainwater from the existing and planned halls, roads and yards will be discharged to the industrial and stormwater sewage system operating in the area of the Copper Smelter and directed farther to the existing wastewater treatment plant owned by Spółka z o.o. ENERGETYKA. Rainwater from external and internal access roads, storage sites and car parks will be pre-treated in local sand traps and coalescence separators before being transferred to the wastewater pre-treatment plant.

Similarly, sanitary sewage from rest and refreshment rooms in the planned facilities will be discharged to the existing sanitary sewage system localised in the premises of the Copper Smelter and then will be transferred via the sewage system to the existing sewage treatment plant of ENERGETYKA Sp. z o.o.

### ***Other elements of the environment***

The planned undertaking will be localised in industrial areas and therefore it will not change the method of developing the area in question and the existing landscape and spatial conditions of the adjacent areas.

The planned new systems will be installed on hardened foundations or inside rooms with impenetrable floors.

Under the electrolyte storage tanks and sulphuric acid tanks there will be pans protecting the environment against penetration of harmful substances to the ground and pollution of groundwater.

Waste and hazardous substances will be stored in designated places to prevent pollution of the ground surface and penetration to the groundwater and farther to underground water. The access roads and the network of internal roads to be extended will have impenetrable and washable surfaces with the slopes directed towards catch basin grates of the storm sewer system network being extended. Implementation of the planned investment will not have any impact on the closest Natura 2000 areas.

The planned undertaking requires construction of a new access road running to the planned Scrap Management Base and necessary clearance of trees. There are approx. 130 trees in total in the area under consideration. The natural inventory demonstrated that in the tree-covered area there are no animal breeding grounds.

In the direct vicinity of the planned project there are no historical monuments or buildings protected under provisions on protection and care of monuments. Also there are no archaeological monuments.

Installation of the cupriferous scrap processing system will not exert a significant impact on the climate of the surrounding area.

### **Final conclusion**

**According to the technical and process documentation of the planned undertaking, i.e. "Installation of a scrap and other cupriferous materials melting plant in the Legnica Copper Smelter" shall not exert an adverse impact on the condition of the environment in the area under consideration. The planned undertaking meets the requirements resulting from the best available techniques and environmental standards applicable in our country.**