



ArcelorMittal

# Combined Heat and Power Plant Project

## Non-Technical Summary



**1 INTRODUCTION AND PROJECT DESCRIPTION**

ArcelorMittal Zenica (“AMZ”) is implementing in partnership with the Municipality of Zenica and other international partners, a new project for the replacement of the existing Combined Heat and Power Plant (the “Project”) with a new one.

The Project is a new, modern Combined Heat and Power facility that will use gases generated in the production process of AMZ (from the coke oven and blast furnaces) to produce heat, electricity and compressed air. Supplementary (backup) fuel will be natural gas that will be used in case of disruption only.

The Project’s heat output will be used for the heating of the City of Zenica and in the form of steam for AMZ industrial needs. The electricity generated will be delivered in the national grid and the compressed air will be used by AMZ.

The Project will be constructed within the premises of the AMZ industrial site, in the vicinity of the existing power plant which will be replaced by the Project. The Project will require an area of 2.9 ha at the southern part of the AMZ site. The location of the Project is represented in the below figure.

**Figure 1. Project Location Map**



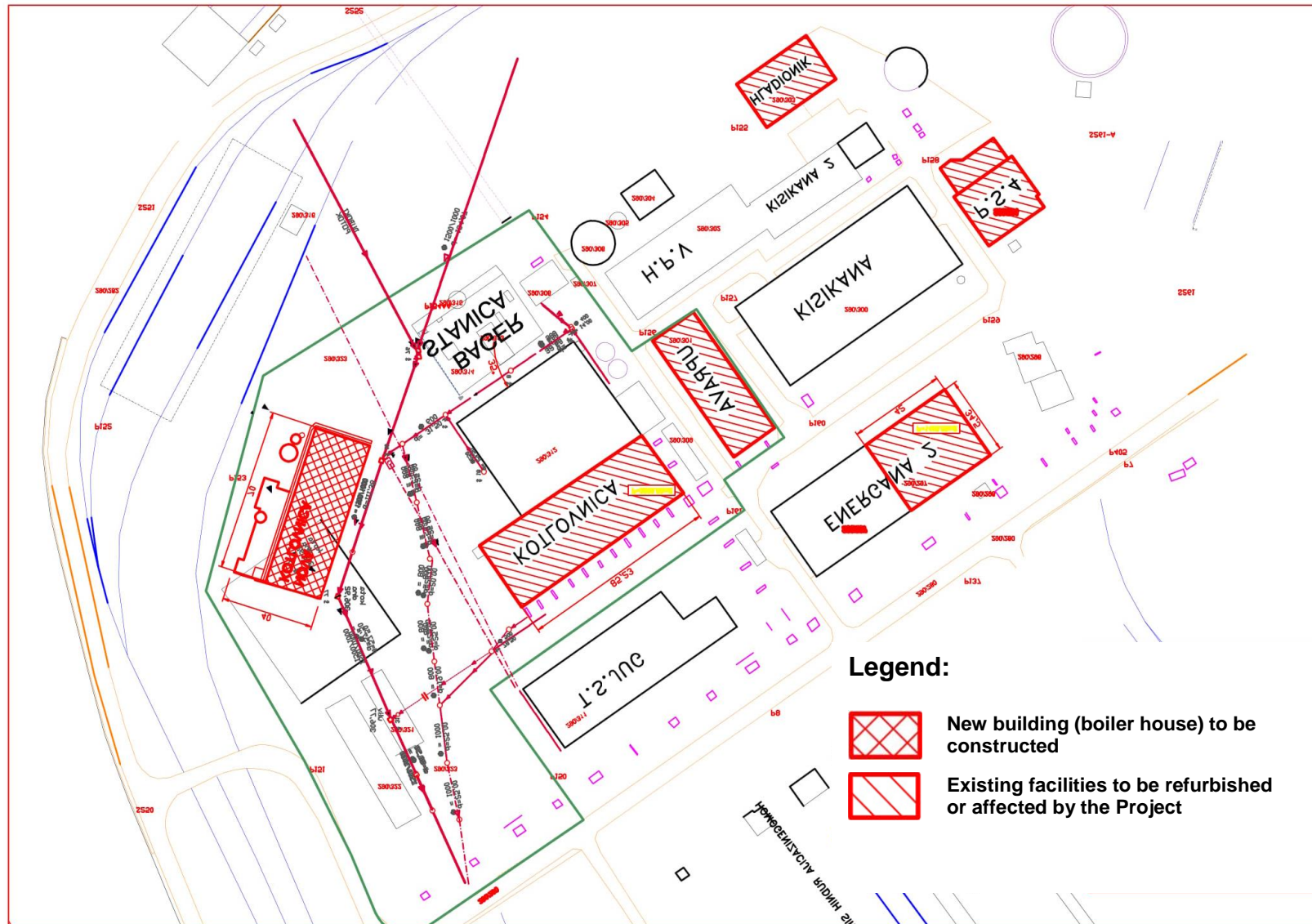
The Project will comprise the construction of a new boiler house and the refurbishment of existing facilities and infrastructure which are required for the operation of the new cogeneration plant.

The main Project elements are briefly summarized as follows:

- Construction of a new boiler house provided with 3 new gas-fired boilers with 90-95% efficiency. Each boiler has the capacity to produce 50 t/h of steam and is provided with 2 burners allowing operation on different gas mixtures. The boiler plant will be provided with one unit for the purification of the combustion gases (scrubber system). The combustion gases will be released into atmosphere through 2 stacks of 55 m height. Two of the boilers (operating on coke oven and blast furnace gas mixture) will be connected to one of the stacks, while the third boiler, operating on blast furnace gas only will be connected to the second stack.
- New gases and steam connections to the new boiler house.
- Refurbishment of the existing demineralized water system using water supply from the existing AMZ system.
- Refurbishment of existing turbo generation station comprising 2 turbo generators with capacities of 7 MW and 25 MW. The turbo generators comprise as main components a steam turbine and an electric generator to convert steam energy into electricity.
- Refurbishment of the existing turbo blower house. The facility will comprise 2 turbo blowers (only one operational at a time) operating using steam and will supply air to the existing blast furnace of AMZ. Additionally, one of the currently existing turbo blowers will be converted into an electric blower (will operate based on electricity instead of steam) to allow during winter time the use of the steam for supplying the heating of the city of Zenica instead of operating the blower. This will allow flexibility and stability for both the plant operations and for the heating of Zenica.
- Refurbishment of the existing heat station for the supply of the city of Zenica.
- Refurbishment of an existing pumping station (Pump Station PS4) including associated cooling unit.
- Refurbishment of existing steam lines and technological gases supply of the new boilers.
- Existing power station administration building will be maintained and will be part of the new cogeneration plant.

A layout map of the Project elements is provided in Figure 2 below.

**Figure 2. Layout map of the Project elements**



The new boiler house will operate continuously and will use technological gases produced in the industrial processes of AMZ at the coke oven and the blast furnace facilities. Natural gas will be used as supplementary, backup fuel to be used in cases of disruption. The supply of fuel gas will be ensured continuously from the AMZ industrial facilities and no storage of fuel gases is needed as part of the Project.

The water required for the operation of the Project will be sourced from the existing AMZ water supply system. The wastewater generated by the Project will be discharged within the AMZ wastewater system for treatment and discharge.

## **2 HOW WILL THE PROJECT AFFECT THE ENVIRONMENT AND THE COMMUNITY?**

The main effects induced by the Project on environment and community are summarised in the following sections.

### **2.1.1 Air emissions and ambient air quality**

Presently AMZ operates an existing power plant for own industrial needs and supplying heat to the City of Zenica. The existing plant burns coal, industrial gases from AMZ processes and natural gas.

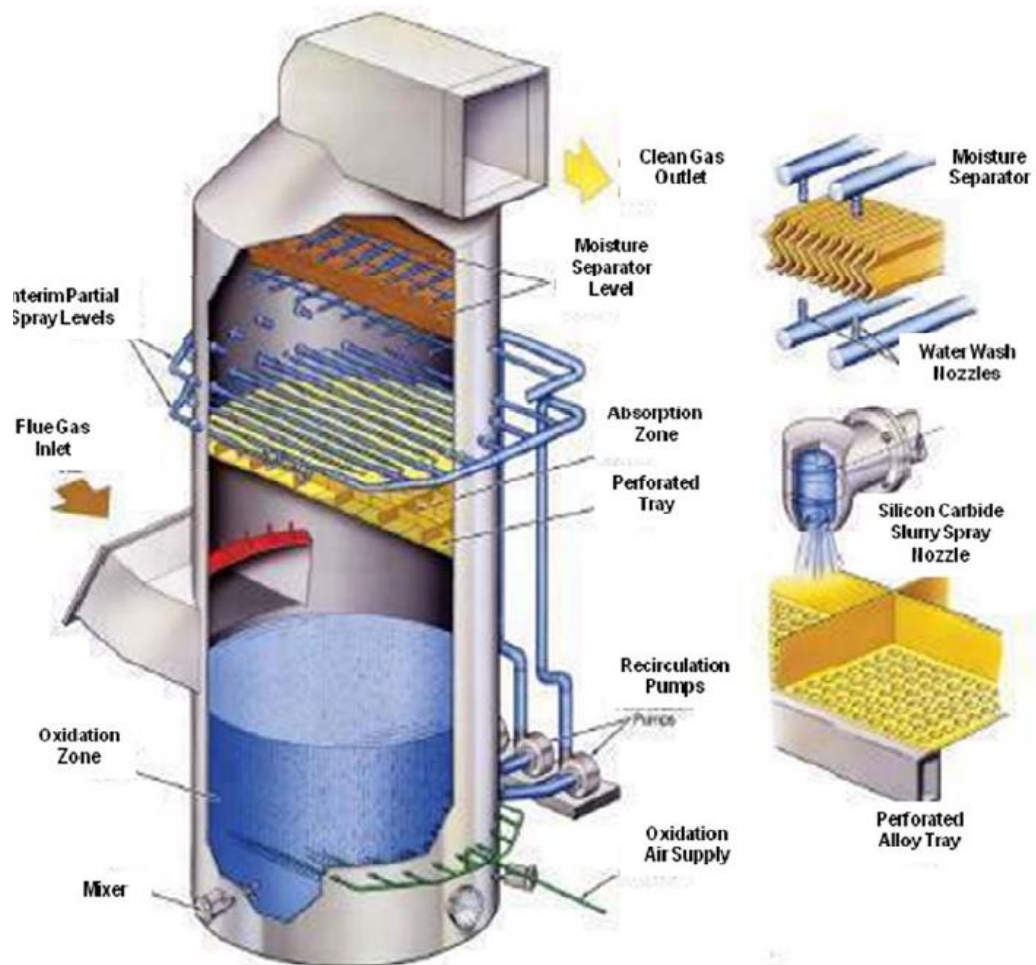
The equipment of the existing heat and power plant is old and less efficient than the modern equipment currently available. Also the existing equipment cannot process the entire process gases from the coke oven plant and blast furnaces, therefore part of these gases are presently burned in a special installation and the emissions are released in the atmosphere (so called “gas flaring” process).

The new combined heat and power plant will bring relevant improvements regarding the air emissions and consequently the ambient air quality. These improvements are the result of the following:

- As opposed to the existing heat and power plant, the Project will not use coal as fuel. The elimination of coal combustion will have positive effects on the air emissions given that “cleaner” fuels will be used instead.
- The Project will use the entire quantity of process gases resulted from the coke oven and blast furnaces. As a result, the gas flaring will not be needed anymore and this additional combustion source eliminated.
- The Project will be provided with modern boilers and equipment aligned to the present technology standards. This equipment is highly efficient, meaning that less fuel will be needed to produce the same quantity of heat and power. This will have positive effects on the quantity of combustion gases released into atmosphere which will be reduced as result of the decrease in the quantity of fuel burned.
- In terms of quantities of pollutants released into atmosphere, these will be drastically reduced compared to those from the existing combined heat and power plant. The dust emissions after the Project will reduce by 94% of the quantities released by the existing heat and power plant, sulphur dioxide (SO<sub>2</sub>) will reduce by 89% compared to current levels, and nitrogen oxides will reduce by 47%.
- The Project is designed to ensure that the concentration of the combustion gases released into atmosphere will comply with both the national standards as well as with the requirements of the relevant European Union regulations (the EU Large Combustion Plants Directive). For the purification of the combustion gasses (or “flue gases”) from the boilers operating on coke oven and blast furnace gases mixture, a special cleaning system (“scrubber unit” or “flue gas

desulphurization unit”) will be employed. The main components of this combustion gases purification system are represented in Figure 3 below.

**Figure 3. Schematic of the combustion gases (flue gases) purification system**



### 2.1.2 Wastewater discharges

As in the case of the existing heat and power plant, during operation the Project will also generate wastewater. These wastewater streams discharged from the Project operations include:

- technological wastewater from the chemical treatment of water for boiler feed (loaded mainly with salts content);
- technological wastewater from the treatment of combustion gases released to atmosphere (loaded mainly with mechanical and other impurities);

- technological wastewater discharged during boilers water removal (“boiler blowdown”) and boilers cleaning (may be loaded with mechanical impurities, suspended particles of iron and copper oxide brought from the feeding system and dissolved salts);
- technological waste water from the venting of the steam and condensate pipelines (loaded mainly with mechanical impurities);
- storm water runoff from roofs and external areas;
- wastewater from sanitary facilities.

An important part of these wastewater streams including those from the boilers blowdown and cleaning, the water from the venting and drainage of the steam and condensate pipelines are recirculated to the water treatment unit and reused.

The water from the treatment of the boilers combustion gases (the flue gas desulphurization unit) is treated by neutralization in a unit part of the Project and discharged into the existing wastewater system of AMZ.

The sanitary wastewater will also be discharged in the existing wastewater system of AMZ.

The Project will also result in improvements regarding the quantities of wastewater discharges which will be reduced and will trigger the elimination of a wastewater stream associated with the operation of the existing heat and power plant. The cease of using coal as fuel will result in the elimination of ash generation. Presently the ash is transported hydraulically to a sedimentation facility (Trokuce sedimentation station) for treatment. This wastewater stream will be eliminated.

Once the Project enters operations, the wastewater discharge from the existing combined heat and power plant will cease. Instead, the above-indicated wastewater streams will be discharged from the Project facilities into the existing wastewater system of AMZ for treatment and discharge together with other wastewater streams from the operations at the AMZ industrial site.

Presently the wastewater streams of AMZ and the wastewater from the city of Zenica are discharged together, as a combined wastewater stream, into Bosna River. A programme for the separation of these wastewater streams is ongoing by the city of Zenica, which is expected to be completed by the end of 2019. Once the wastewater streams are separated, AMZ will implement a project to upgrade and improve its existing wastewater treatment facilities.

### **2.1.3 Noise generation**

The noise sources associated with the new combined heat and power plant are associated with the operation of various equipment e.g. fans, generators, blowers, compressors, etc.



The majority of this equipment is located inside the building spaces of the Project, and the equipment generating increase noise levels is provided with required enclosures and noise abatement including noise suppressors and anti-vibration devices.

The Project equipment and buildings are designed to ensure that the noise levels generated comply with the national regulations and with good international industry practice. Regular maintenance of the plant and equipment will also ensure the noise levels are maintained within the applicable limits.

Once the Project becomes operational, the existing combined heat and power plant will cease its operations. Therefore the Project will not result in additional new noise sources. On the contrary, existing equipment of older generation and associated with higher noise levels will be replaced with modern equipment and less noisy equipment.

#### **2.1.4 Wastes generation and management**

Similarly to the existing combined heat and power plant, during operation the Project will also generate limited quantities of wastes. These wastes include sludge from the industrial water treatment and purification, metal wastes, spent oils and other wastes from the general maintenance of equipment, as well as municipal waste.

As in the case of the existing combined heat and power plant all wastes generated will be temporary stored in appropriately designed facilities at the plant and disposed of through licensed contractors.

Additionally, gypsum will be generated in the process of treatment of the combustion gases from the boilers (the flue gas desulphurization unit). The gypsum will primarily be commercialized as byproduct and only the excess or low-quality gypsum will be disposed of as waste at the Rača industrial landfill.

Also, by ceasing the coal use, the Project will result in eliminating the generation of ash which currently is hydraulically transported and treated at the Trokuce sedimentation station. Currently the sludge from the Trokuce sedimentation station is disposed of as waste. This waste stream will therefore be eliminated once the Project enters operation.

#### **2.1.5 Overall community effects**

Given that the location of the Project is within the premises of the industrial site of AMZ the construction of the new heat and power plant is not expected to result in perceivable community impacts.

During operation the Project is expected to have overall positive impacts on the community as result of the following:



- The Project will replace existing cogeneration plant delivering heat services to the city of Zenica. Upon Project implementation these services will be ensured by a modern and more efficient facility. In addition to the increased reliability of the heat supply to the City of Zenica, the upgraded system will create conditions for accepting connection of new users willing to shift from local fireplace heating burning solid fuel. This would indirectly contribute to improving ambient air quality in the city.
- By replacing existing power plant, the Project will result in the reduction of the air emissions and will trigger an overall improvement of the ambient air quality. This is mainly the result of:
  - ceasing the use of coal as fuel;
  - ceasing of gas flaring (combustion of excess AMZ process gasses which cannot be used at the existing power plant) due to complete utilization of process gases, and
  - the increased plant efficiency triggering less fuel consumption and associated air emissions.
- Ceasing the use of coal will also result in decreasing the truck traffic on the public roads and in communities which is currently needed for the shipment of coal from the mining facility and for the transportation of sludge from ash treatment to Rača industrial landfill for disposal. This will be associated with improved community safety, less public roads damages, and improved local ambient air and noise conditions.
- Local businesses will be employed as suppliers of various materials and services during Project construction and operation.

### **3 WHAT MEASURES TO MITIGATE ADVERSE ENVIRONMENTAL AND SOCIAL IMPACTS ARE CONSIDERED?**

An Environmental Impact Assessment (EIA) is being performed for the Project and will be subject to public consultation and approval in line with the national regulations.

The EIA identified a number of mitigation measures to address the expected impacts associated with the Project construction and operation. The main mitigation measures identified in the frame of EIA are summarised below.

#### Measures during Project construction:

- Use construction vehicles and equipment in good technical conditions and provide these where the case with adequate noise abatement devices and protection. Stop immediately the operation of equipment generating unusually high noise or combustion gases levels and put these back in operation only upon remediating the cause of malfunction.
- Provide all Diesel-powered vehicles and equipment with particles filters.
- Ensure availability of spill absorbent and intervention materials in sufficient quantities and at all active working areas during construction.
- Employ water spraying for dust abatement at the construction site during dry weather and high speed wind conditions.
- Ensure appropriate hazardous and non-hazardous construction wastes storage packaging, handling and disposal.
- Perform construction vehicles and equipment refueling only at dedicated stations provided with appropriate spill control.
- Clean tires of construction vehicles leaving the construction site to access public roads.
- Provide covers on truck loads employed for shipment of dusty materials.

#### Measures during Project operation:

- Install an automatic system for the continuous monitoring of the air emissions from the boilers. Regularly maintain the automatic emissions monitoring system and keep a record of its operational parameters.
- Provision of de-dusting system at the hydrated lime silo (lime is used in the process of combustion gases desulphurization).
- Ensure at all times appropriate wastes storage, handling and disposal.
- Store the gypsum resulted from the combustion gases purification in dedicated silos or warehouse until supplied to customers or disposed to the Rača industrial landfill.



- Record technological wastes generated by type and quantity and ensure the storage, handling, shipment and disposal of wastes according to a Waste Management Plan and in line with national regulations.
- Define and implement procedures for plant operation in extraordinary (other than normal) conditions (e.g. in case of disruption in the operation of the combustion gases purification system, etc.) and for recoding and reporting such events and mitigation measures taken to authorities in line with the national law.
- Define and implement procedures for response in case of emergency situations approved by the competent authorities.
- Define and implement a monitoring plan including continuous and periodic monitoring of the environmental emissions. Report the results of the environmental monitoring to authorities on annual basis and as required in response to authorities specific requests. The EIA monitoring plan proposed in the Project EIA includes:
  - continuous monitoring of air emissions from the boilers using automatic measurement system;
  - yearly measurements of air emissions from the boilers by an independent licensed laboratory;
  - bimonthly quality measurements by an independent licensed laboratory of wastewater streams discharged from the Project into AMZ wastewater system;
  - yearly measurements of noise levels at the Project facility boundaries by an independent licensed laboratory;
  - maintaining records of water consumption on daily basis;
  - maintaining records of quantities of wastes generated on daily basis.

In addition to the above, an Environmental and Social Action Plan (ESAP) comprising a number of measures aimed at addressing the environmental and social impacts of the Project will also be implemented. The main ESAP measures regarding the new combined heat and power plant project include:

- Establish overarching policy for the Project defining the environmental and social objectives and principles and providing a framework for the environmental and social assessment and management process.
- Establishment of an Environmental Management System (EMS) for the Project. Ensure that the Project EMS includes the elements aimed at attaining the applicable best available techniques required under the EU Large Combustion Plants Directive.
- Develop and implement an Environmental and Social Management Plan (ESMP) addressing the Project impacts during construction stage and defining the process and responsibilities for the management and supervision of construction contractors.



ArcelorMittal

- Permanent evaluation of employees required skill set, and accountabilities and capacity for operation and maintenance of the Project and provide required training.
- Ensure emissions to air from the boiler plant are in compliance with the EU standards ( $\text{SO}_2$  200 mg/ $\text{Nm}^3$ ,  $\text{NO}_x$  100 mg/  $\text{Nm}^3$ ,  $\text{CO}$  140 mg/  $\text{Nm}^3$ ,  $\text{PM}$  10 mg/ $\text{Nm}^3$ ). Perform continuous monitoring of air emissions from the boilers.
- Monitor the quality of gypsum generated as a Project by-product and sell or dispose of as waste or hazardous waste according to the result of the analysis.
- Track and the greenhouse gases emissions of the Project.
- Implement a stakeholder engagement plan, to ensure that stakeholder expectations and views are understood and required measures to meet or manage those expectations are planned and implemented.

**4 HOW CAN I FIND MORE INFORMATION ABOUT THE PROJECT AND COMMUNICATE MY OPINION?**

This Non-technical Summary and additional information on the Project the environmental performance of the company is provided and continuously updated on the company's website at:

<https://zenica.arcelormittal.com/corporate-responsibility/environment.aspx>

The Project EIA will be subject to the environmental permitting procedure which allows the general public to review the complete EIA information and provide feedback. The availability of the Project EIA for general public review and the dates and location of the public hearing will be announced by the authorities in line with the regulations and will also be announced on the company's website at: <https://zenica.arcelormittal.com/corporate-responsibility/environment.aspx>

In addition to the above anybody willing to express their views or submit questions about the Project can address these at all times by following means:

- By contacting our Environmental Team using the following contact details:

T: +387 32 467 025

E-mail: [ekologija@arcelormittal.com](mailto:ekologija@arcelormittal.com)

- By sending contacting the company reception at:

T: +387 32 467 207

- By sending a letter by post to the following postal address:

ArcelorMittal Zenica

Bulevar Kralja Tvrtka I br. 17

72000 Zenica

Department Environment