



Pollutant Emission Registry for the Gacko municipality **Policy Brief**

INTRODUCTION

The Gacko municipality is one of the most developed municipalities in Bosnia and Herzegovina, with a thriving economy and industry. The main driver of economic development in the municipality is the Gacko coal mine and thermal power plant (RiTE Gacko), one of the three thermal power plants in the Republika Srpska, employing nearly 2,000 workers. In order to improve transparency and reduce environmental pollution, a **Pollutant Emission Registry for the Gacko municipality** has been developed. This document enables a better understanding of the impact of emissions on the environment and public health, as well as the identification of measures to reduce emissions in the future.

A methodology and model have been developed for the preparation of the Pollutant Emission Registry (PER) for small and diffuse sources of air emissions, taking into account the Nomenclature for Reporting (NFR) sector for spatial distribution in a high-resolution grid, in accordance with the Cooperation Program for Monitoring and Assessment of Transboundary Air Pollution in Europe (EMEP/EEA), the 2019 Air Emission Inventory Guide, and the Law on Air Protection of the Republika Srpska (Official Gazette of the Republika Srpska No. 28/7, 41/8, 29/10).

The PER plays an important role in strengthening shared responsibility, reducing pollution, and promoting sustainable development in accordance with the Aarhus Convention. The Registry enables the analysis of emissions and provides information for assessing their impact on human health and the environment. It also serves as a basis for the future development of an atmospheric dispersion model to assess pollutant concentrations in the air.

The aim of developing the PER for the Gacko municipality is to improve public access to information by establishing a comprehensive registry of emissions and pollutant transfers. This facilitates public involvement in environmental decision-making and contributes to reducing environmental pollution.

The Pollutant Registry has been developed in a geographic information system (GIS) and covers various sources of air emissions. As part of the registry development, a GIS database has been created, which includes point, line, and area sources of emissions. Project activities include methodology development, listing of legal entities and emission calculations, household emission surveys, preparation of a geocoded high-resolution grid, data analysis, database development and creation of the web application for the Registry.

SOURCES OF AIR EMISSIONS IN THE GACKO MUNICIPALITY

The Pollutant Emissions Registry of the Gacko municipality encompasses various types of pollutants emitted as a result of human activities.

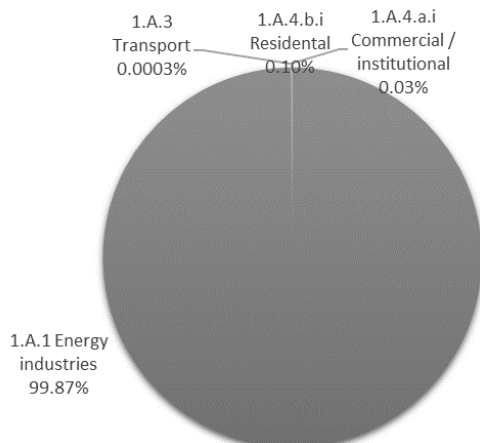


Figure 1. Emissions of SOx by sectors

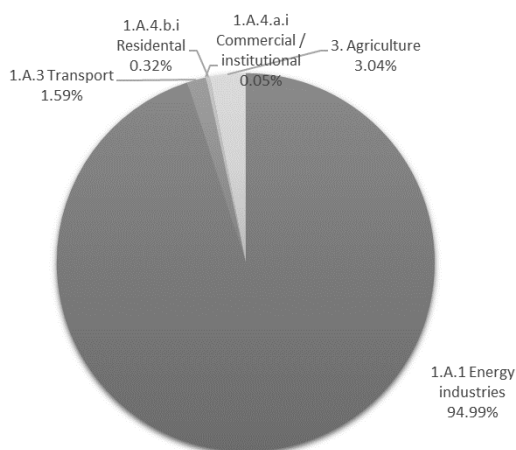


Figure 2. Emissions of NOx by sectors

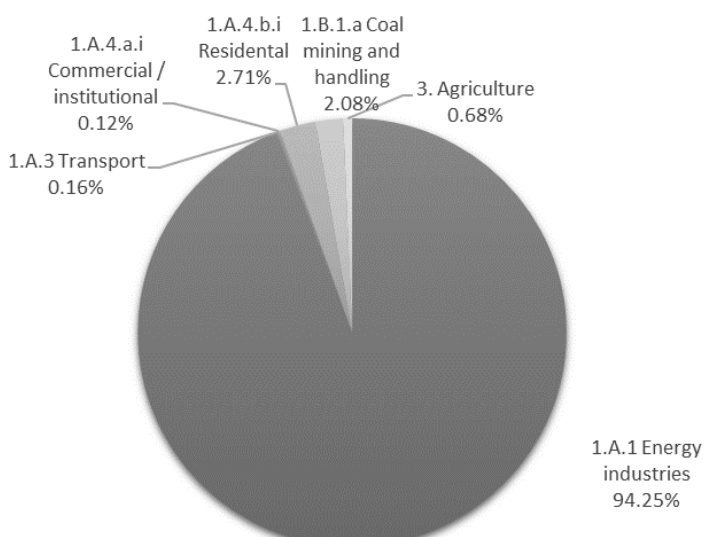


Figure 3. Emissions of PM10 by sectors

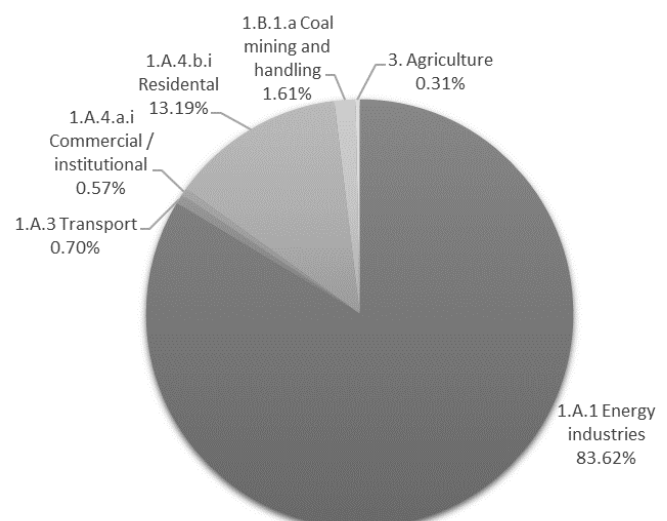


Figure 4. Emissions of PM2.5 by sectors

• Industrial emission sources

Industrial emission sources represent a significant source of air pollution in the municipality of Gacko. The most significant polluter in this sector is the Gacko Thermal Power Plant (RiTE Gacko). Emissions from coal combustion for electricity and heat production include sulfur dioxide (SO₂), nitrogen oxides (NO_x), particulate matter (PM), heavy metals, and other pollutants. SO₂ and NO_x emissions are the most dominant from this sector, accounting for 99.9% and 95% of the total emissions of these pollutants in the municipality of Gacko, respectively.

• Emissions from small combustion sources

Emissions from small combustion sources, particularly individual heating systems such as solid fuel stoves burning wood or coal, represent a significant source of air pollution. These emissions contain various harmful substances that negatively impact air quality and human health. Emissions from these combustion sources include particulate matter (PM₁₀ and PM_{2.5}), carbon monoxide (CO), and other pollutants.

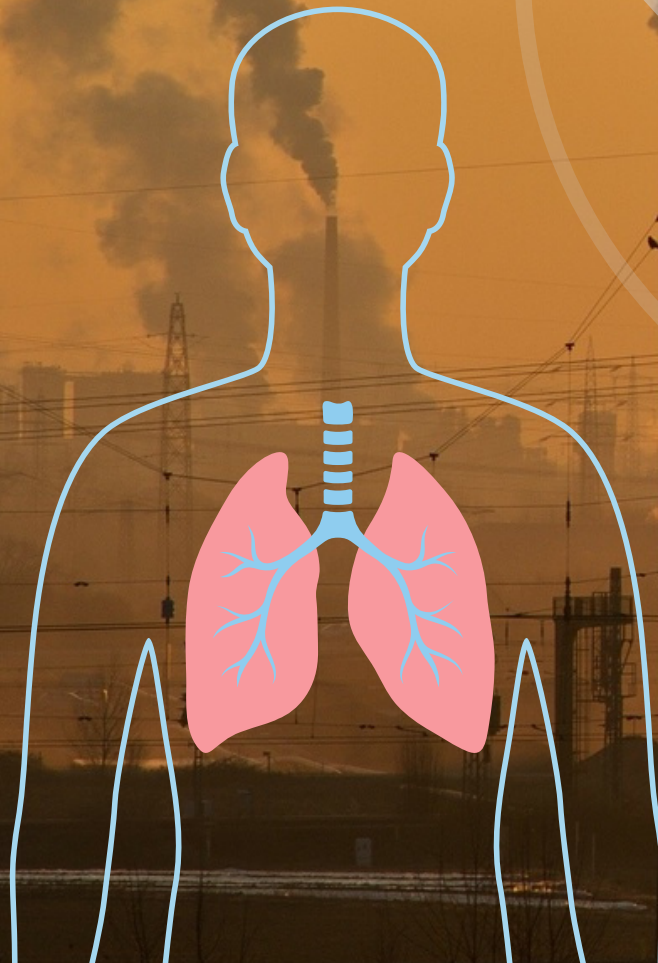
• Transportation

Emissions from the transportation sector account for less than 6% of the total emissions for each pollutant. The highest share within the transportation sector is in CO emissions, representing 5.5% of the total emissions.

IMPACT ON HEALTH AND ENVIRONMENT

The PER enables the assessment of air pollutants impact on the environment and public health. Pollutants such as SO₂, NO_x, and PM particles have a negative influence on air quality and can cause respiratory problems in humans. Additionally, heavy metals and other toxic substances present in emissions can have long-term harmful effects on the environment and ecosystems.

Providing information on emissions of pollutants from various sources allows for decision-making regarding emission reduction, improvement of technologies, and implementation of sustainable practices in industries and households. This contributes to environmental protection, preservation of natural resources, and enhancement of the quality of life for residents.



NEXT STEPS

Based on the information collected through the Pollutant Emissions Registry, the main sources of pollution have been identified. Using the research and analysis results, local authorities and relevant institutions can make decisions and implement regulatory measures to limit the emissions of pollutants in the future.

In addition to the regulatory aspect, it is important to promote and support the adoption of sustainable practices and technologies in industries and households. This can include incentives for transitioning to cleaner energy sources, improving energy efficiency, implementing filtration systems, and reducing the use of pollutants in manufacturing processes.

Raising public awareness about pollution and its impact on the environment is crucial for behavioral change and the adoption of sustainable practices. Local authorities, along with educational institutions, can organize campaigns and educational programs about the importance of environmental conservation, the harmful effects of pollutants, and methods to reduce emissions.

Continuous monitoring of pollutant emissions and regular reporting of the results enable tracking progress in pollution reduction and identifying areas that require additional efforts. Transparency in data collection and publication of emissions information provides citizens and relevant institutions with valuable insights, contributing to responsible management and informed decision-making.

As part of the project, a web platform called zraq.ba (www.zraq.ba) has been developed, allowing citizens to stay informed about air quality in their area. Citizens have access to an interactive map on the website, displaying georeferenced data on air emissions in the Gacko municipality. By developing this web platform, citizens are empowered with access to relevant air emissions information, enhancing transparency, accountability, awareness of air pollution, and encouraging actions aimed at improving environmental quality.



CONCLUSION

The air quality in the Gacko municipality can be described as problematic, with high levels of pollution caused by various emission sources. Reducing air pollution represents a significant challenge and requires a comprehensive strategy that involves emission reduction from all sources, improvement of technology, and the development of alternative energy sources.

Based on the study results, to address the air pollution issue, the following steps are recommended: reducing emissions from transportation, promoting clean energy sources, improving industrial processes, reducing emissions from surface mines, decreasing agricultural emissions, and raising awareness while promoting individual actions.

Considering that emissions from the Thermal Power Plant can spread over a larger geographic area, further recommendations include developing an emission registry to assess the contribution of each sector to local air quality and evaluating the impact and cross-border transport (beyond the borders of Bosnia and Herzegovina) of pollutants from the Gacko municipality, with a focus on the influence/contribution of the Gacko Thermal Power Plant.

Additionally, conducting an awareness campaign among citizens about the importance of preserving clean air and its positive effects on human health and the environment is recommended. Education on energy efficiency, reducing the use of fossil fuels, and promoting renewable energy sources can be valuable steps toward reducing air pollution.

By implementing these recommendations and fostering collaboration among all relevant stakeholders, the municipality of Gacko can achieve significant improvements in air quality, creating a healthier and more sustainable environment for its residents.

