

Factsheet on air quality in Bosnia and Herzegovina

- There is a historical problem with ambient air quality in several urban areas of Bosnia and Herzegovina. **Sarajevo** is prone to heavy fog in winter that converts into smog when mixed with high pollution levels. Combined with weak wind or a stable anticyclone, pollutants persist in the city's air for a prolonged period, causing peaks in the particulate matter (PM) concentrations, posing significant health risks to the residents. Major sources of pollutants' emissions in Sarajevo are residential heating, traffic and some point sources such as industrial plants. In the industrial city of **Tuzla** the values of the PM10 are regularly above the Federation of BiH legislation limits¹, with peaks at over 300 µg/m³. According to the WHO's database of annual air pollution readings (2017), Tuzla was the second most polluted city in Europe after Tetovo. The two largest polluters (Kakanj's thermal power plant and ArcelorMittal steel plant) in the **Zenica** area emit an annual 90,000 tons of SO₂, which accounts for over 20% of the total SO₂ emissions in BiH. The emission sources in the Zenica - Doboje Canton participate with 72% into the total emission of PM particles from the Federation of BiH. In Republika Srpska, according to official statistics, number of daily exceedances in 2015 of the PM10 limit value registered in Brod are 142, Ugljevik 26, Gacko 61 and Banja Luka - Center 67.²
- We as the UN should promote the use of air quality monitoring data from official sources, both for programming and communication purpose. The data on AQ in the Canton of Sarajevo are available in real time from 6 AQ monitoring stations managed by the Cantonal Public Health Institute, and are online: <http://kvalitetzraka.ba/>. The official data on AQ in the Tuzla Canton are also online: <http://monitoringzrakatk.info/>. The federal AQ monitoring network is operated by the Federal Hydro-Met institute and real-time data can be found at <http://fhmzbih.gov.ba/>. The stations in RS are largely out of function due to funding difficulties. Currently only the station in Prijedor sends real-time data from RS to the website www.hidrometeo.ba that shows all stations in BiH operated by the hydro-met institutes. There is **no** officially computed and verified Air Quality Index published for cities in Bosnia and Herzegovina. AQ emergency episodes are declared based on the limit values of different pollutants, prescribed by the national legislation (Annex 1, Annex 2).
- According to 2017 WHO statistics, Bosnia and Herzegovina (BiH) has the highest European mortality rate attributed to air pollution. However, there are no official national data to support or deny this finding. Public health institutes in the country currently do not collect data on health impacts of air pollution and communicate environmental health risks to the public only sporadically.
- Although the legal framework for air quality is largely in place³, implementation and enforcement remain weak. National recognition of the problem through strategic documents, local action plans with implementable solutions and public awareness of the air pollution impacts and mitigation measures are all key to tackling the issue but are all missing in the country.

¹ Please consult Annex 1 on air quality limits for reference values

² To get more familiar with different air pollutants and their sources, please consult Annex 3

³ Legal framework for air protection in BiH is provided in Annex 2

- BiH is party to the “Air Convention” – UNECE Convention on Long-range Transboundary Air Pollution since 1993, which is a key multilateral agreement for reduction and prevention of air pollution in the region and provides access to emission, measurement and modelling data, as well as information on the effects of air pollution on ecosystems, health, crops and materials. The Convention has been extended by eight protocols that identify specific measures to be taken by Parties to cut their emissions of air pollutants. However, the country has ratified only one of those protocols and has never reported to this Convention or used any technical assistance possibilities.
- UN Day 2017 conference “Clean Air for All” came up with a list of key messages to be used for air quality communication and awareness raising purposes, here listed in Annex 4 for reference.

Annex 1: Air quality limit values in Bosnia and Herzegovina as compared to the WHO guidelines and EU standards

Pollutant	WHO air quality guidelines	FBiH	RS	EU air quality standards
PM 10	20 µg/m ³ annual mean 50 µg/m ³ 24-hour mean	40 µg/m ³ annual mean 50 µg/m ³ 24-hour mean	40 µg/m ³ annual mean 50 µg/m ³ 24-hour mean	40 µg/m ³ annual mean 50 µg/m ³ 24-hour mean
PM 2.5*	10 µg/m ³ annual mean 25 µg/m ³ 24-hour mean	20 µg/m ³ annual mean NA for 24-hour mean	20 µg/m ³ annual mean NA for 24-hour mean	25 µg/m ³ annual mean
O ₃	100 µg/m ³ 8-hour mean	120 µg/m ³ 8-hour mean	120 µg/m ³ 8-hour mean	120 µg/m ³ 8-hour mean
NO ₂	40 µg/m ³ annual mean 200 µg/m ³ 1-hour mean	40 µg/m ³ annual mean 200 µg/m ³ 1-hour mean	40 µg/m ³ annual mean 150 µg/m ³ 1-hour mean	40 µg/m ³ annual mean 200 µg/m ³ 1-hour mean
SO ₂	20 µg/m ³ 24-hour mean 500 µg/m ³ 10-minute mean	125 µg/m ³ 24-hour mean 350 µg/m ³ 1-hour	125 µg/m ³ 24-hour mean 350 µg/m ³ 1-hour	125 µg/m ³ 24-hour mean 350 µg/m ³ 1-hour

*PM2.5 is not measured on all monitoring stations in BiH

Annex 2: Legal Framework for Air Protection in Bosnia and Herzegovina

Level of Government	Law	Subordinate	Strategy
RS	the Law on Air Protection (OG RS No. 124/11, 46/17)	The Decree on Air Quality Limit Values (OG RS 124/12)	RS Strategy on Air Protection (2011)

		the Rulebook on Measures for Preventing and Reducing Air Pollution and Improving Air Quality (OG RS No. 3/15, 51/15, 47/16)	
FBiH	the Law on Air Protection (OG FBiH No. 33/03, 4/10)	<p>The Regulation on the method of monitoring air quality and defining type of pollutants, limit values and other air quality standards. (OG FBiH No. 1/2012)</p> <p>The Regulation on monitoring of air emissions (OG FBiH No. 9/2014)</p> <p>The Regulation on monitoring of air quality OG FBiH 12/05, 9/16)</p> <p>The Regulation on Limit Values of Air Emissions from Combustion Plants (OG FBiH No. 03/13)</p>	Federal strategy on Environmental Protection
Brcko District	The Law on Air Protection (OG BD No. 25/04, 1/05, 19/07, 9/09)	<p>The Regulation on Limit Values of Air Emissions (OG BD No.30/06)</p> <p>the Regulation on Limit Values of Air Emissions from Combustion Plants OG BD No.30/06)</p>	
Canton Sarajevo	The Law on Air Protection (OG FBiH No. 33/03, 4/10;	<p>The Regulation on the method of monitoring air quality and defining type of pollutants, limit values and other air quality standards. (OG FBiH No. 1/2012)</p> <p>The Regulation on monitoring of air emissions (OG FBiH No. 9/2014)</p> <p>The Regulation on monitoring of air quality</p>	<p>Canton Sarajevo Plan on Environmental Protection (2017)</p> <p>Action plan on reducing particulate matter from air in the area of Canton Sarajevo (OG KS 16/13)</p>

		OG FBiH 12/05, 9/16)	
		the Regulation on Limit Values of Air Emissions from Combustion Plants (OG FBiH No. 03/13)	
Tuzla Canton	The Law on Air Protection (OG FBiH No. 33/03, 4/10;	The Regulation on the method of monitoring air quality and defining type of pollutants, limit values and other air quality standards. (OG FBiH No. 1/2012 The Regulation on monitoring of air emissions (OG FBiH No. 9/2014) The Regulation on monitoring of air quality OG FBiH 12/05, 9/16) the Regulation on Limit Values of Air Emissions from Combustion Plants (OG FBiH No. 03/13)	Plan on Environmental Protection of Tuzla Canton 2015-2020 (OG TK 5/15) Contingency Plan for excessive air pollution levels in area of Tuzla Canton
Zenica - Doboј Canton	The Law on Environmental Protection (OG ZDK, 1/100)	The Regulation on Combustion Plants that must obtain the environmental permit for commissioning (OG ZDK, 14/13)	Decision on Plan on Environmental Protection of Ze-Do Canton 2017-2025 (OG TK 5/15) Contingency Plan for excessive air pollution levels in area of ZE-Do canton
Bosnian-Podrinje Canton	The Law on Environmental Protection (OG BPK Gorazde, 5/05, 11/10, 8/11)	The Regulation on Combustion Plants that must obtain the environmental permit for commissioning (OG BPK, 1/05, 2011)	
Herzegovina-Neretva Canton	The Law on Air Protection (OG HNK No. 7/14)		

Una-Sana Canton	The Law on Air Protection (OG FBiH No. 33/03, 4/10)		Decision on Plan on Air Quality Protection in USK 2017-2025- Draft
Canton 10	The Law on Air Protection (OG FBiH No. 33/03, 4/10)	The Regulation on Combustion Plants that must obtain the environmental permit for commissioning (OG. Canton 10 no 7/05, 12/08)	
West Herzegovina Canton	The Law on Air Protection (OG FBiH No. 33/03, 4/10)	<p>The Regulation on the method of monitoring air quality and defining type of pollutants, limit values and other air quality standards. (OG FBiH No. 1/2012</p> <p>The Regulation on monitoring of air emissions (OG FBiH No. 9/2014)</p> <p>The Regulation on monitoring of air quality OG FBiH 12/05, 9/16)</p> <p>the Regulation on Limit Values of Air Emissions from Combustion Plants (OG FBiH No. 03/13)</p> <p>The Regulation on Combustion Plants that must obtain the environmental permit</p> <p>The Regulation on Combustion Plants that must obtain the environmental permit for commissioning (OG. ŽZH no 2/06)</p>	
Posavina Canton	N/A		
Central Bosnia Canton	The Law on Air Protection (OG SBK no. 11/00)		

Annex 3: Definitions of air pollutants

Pollutant	Name	Definition
PM 10 PM 2.5	Particulate matter (Fine particles, dust)	<p>Airborne PM includes a wide range of particle sizes and different chemical constituents.</p> <p>It consists of both primary components, which are emitted directly into the atmosphere, and secondary components, which are formed within the atmosphere as a result of chemical reactions.</p> <p>Of greatest concern to public health are the particles small enough to be inhaled into the deepest parts of the lung. Air Quality Objectives are in place for the protection of human health for PM10 and PM2.5 – particles of less than 10 and 2.5 micrometres in diameter, respectively.</p>
O₃	Groundwork ozone (tropospheric ozone)	<p>Ozone (O₃) is not emitted directly into the atmosphere, but is a secondary pollutant generated following the reaction between nitrogen dioxide (NO₂), hydrocarbons and sunlight. Whereas nitrogen dioxide acts as a source of ozone, nitric oxide (NO) destroys ozone and acts as a local sink (NOX-titration). For this reason, O₃ concentrations are not as high in urban areas (where high levels of NO are emitted from vehicles) as in rural areas. Ambient concentrations are usually highest in rural areas, particularly in hot, still and sunny weather conditions which give rise to summer "smogs".</p>
NO₂	Nitrogen dioxide	<p>Combustion processes emit a mixture of nitrogen oxides (NO_x), primarily nitric oxide (NO) which is quickly oxidised in the atmosphere to nitrogen dioxide (NO₂). Nitrogen dioxide has a variety of environmental and health impacts. It is a respiratory irritant which may exacerbate asthma and possibly increase susceptibility to infections. In the presence of sunlight, it reacts with hydrocarbons to produce photochemical pollutants such as ozone. NO₂ can be further oxidised in air to acidic gases, which contribute towards the generation of acid rain.</p>
SO₂	Sulphur dioxide	<p>Sulphur dioxide is a corrosive, acidic gas which combines with water vapour in the atmosphere to produce acid rain. Both wet and dry deposition obtain been implicated in the damage and destruction of vegetation and in the degradation of soils, building materials and watercourses. SO₂ in ambient air is also associated with asthma and chronic bronchitis.</p>
Short Lived Climate Pollutants (STCP)		
<p><i>Urban air pollution is also a critical climate issue. Short-lived climate pollutants such as black carbon and methane are main contributors to health-harmful air pollution. These SLCPs obtain a short lifespan in the atmosphere, meaning that harmful concentrations of SLCPs can be reduced in a matter of weeks to years, resulting in near-term climate benefits as well as health benefits from improved air quality.</i></p>		
BC	Black Carbon	<p>Black carbon is a major component of soot and is produced by incomplete combustion of fossil fuel and biomass. It is emitted from various sources including diesel cars and trucks, residential stoves,</p>

		forest fires, agricultural open burning and some industrial facilities. Black carbon and co-pollutants make up the majority of PM2.5 air pollution, which consists of particles 2.5 micrometres or smaller in diameter (approximately 40 times smaller than a grain of table salt), and is the leading environmental cause of poor health and premature death
CH₄	Methane	Methane emission caused by human activities (agriculture, waste disposal, mining) are one of the most drivers of climate change. Methane is also main precursor of tropospheric ozone, a powerful greenhouse gas and air pollutants

Annex 4: Key messages of the “Clean Air for All” conference

1. Outdoor air pollution is a major environmental health problem and a round year issue.
2. Air pollution requires multisector approach and involvement of larger number of stakeholders.
3. Both short and long-term exposure to air pollutants has been associated to health impacts.
4. Air pollution increases the risk of respiratory and heart disease in the population. More severe impacts affect people who are already ill. The elderly, children and poor people are more susceptible.
5. Air quality in several cities of BiH during winter days without precipitation remains a matter of serious concern. Poverty causes use of non-standard fuels, high-emission vehicles and disruptions in the spatial planning which all lead to high levels of air pollution in BiH.
6. Existing positive examples show that tackling air pollution is not simple, but it is possible, and requires the multisector approach and involvement of multiple stakeholders. Each example shows that the innovativeness is the key and the role of the scientific community of vital importance.
7. The priority should be given to measures which result in multiple benefits. Improving energy efficiency in buildings reduces poverty and improves quality of life. Improving quality and accessibility of public transport reduces air pollution, climate change and saves time. Innovative transport methods like “car sharing” and “bicycle sharing” significantly contribute to the reduction of emissions.
8. It is necessary to continue improving district heating systems throughout the country, especially those based on renewable energy sources and use waste heat from the industry. Improving energy efficiency and application of the renewable energy sources in industry can significantly contribute to lowering air pollution.
9. Applying resource efficiency and cleaner production methods through the so called “green” and/or “circular” economy, at the same time reduces energy and material costs in industrial production, making it more competitive.
10. It is necessary to advance awareness of air pollution impacts on human health and ecosystems
11. A comprehensive and reliable emissions and air quality register is necessary, alongside the determined level of the impacts on human health and environment as a basis for decision making



12. Air Quality Management Plans shall address and recognize all sources of pollution prioritizing innovative and comprehensive measures that can provide multiple benefits.