



**MINISTRY OF FOREIGN TRADE AND ECONOMIC RELATIONS
OF BOSNIA AND HERZEGOVINA**

“Improved environmental monitoring and assessment in support of the 2030 Sustainable Development Agenda in South-Eastern Europe, Central Asia and the Caucasus”

Webinar 1 “Health-relevant air quality data informing policy and the public”, 16 December 2020

Azra Rogović-Grubić, Senior Adviser

- Air Quality Monitoring and Data Management
- National/international reporting (including for SDG indicators)
- Approach to Public Air Quality Information (including availability of not aggregated data)
- Data Use for Environment and Health Policies

AMBIENT AIR QUALITY IN BIH

- BiH residents are exposed to some of the highest levels of air pollution in Europe
Estimated to be 223 deaths per 100 000 people (WHO)
- Different emission sources and geographic circumstances
Traffic, industry, domestic heating, etc.
- Lack of capacity
Trained staff, equipment, implementation gaps, continuous funding



OBLIGATION BOSNIA AND HERCEGOVINA IN ACCESSION PROCESS

Obligation arising from SAA:

Artical. 70 SAA obligation Bosnia and Herzegovina

- Harmonization of Legislation with EU
 - Efficient Laws Enforcement
- special SAA articles related to the Environment

Environmental Protection:

Obligations to meet Environmental criteria of Accession:

- Political
- Economic
- Environmental

MEMBERSHIP

Ability to assume membership obligations:

- Meeting EU objectives
- Enforcement and effective implementation of the EU acquis

STRATEGY OF APPROXIMATION OF EU LEGISLATION IN BOSNIA AND HERZEGOVINA

EAS STRATEGY ADOPTED BY COUNCIL OF MINISTRES OF BOSNIA AND HERZEGOVINA, MAY
2017

The strategy covers sub-sectors - a group of legislative instruments: Horizontal, Water management, Waste management, Air quality, Climate change, Industrial pollution, Chemicals, Nature protection, Noise.

Estimated cost of approximation in the Environmental Sector in Decembre 2014 is: 7,1 billion Euro.
Sub-sectors: Water management - 3,829 billion Euro, **Air and Industrial Pollution-
2,047 billion Euro**, Waste management -1,005 billion Euro

The European Commission has confirmed that the Environment Sector has fulfilled the prerequisite for the withdrawal of IPA II funds for the period 2018. to 2020. The IPA II process, different from IPA I, is based on strategic planning and results.

NEXT STEPS:

- Sectorial Planning Document for the Environment from 2018 to 2020
- An Action Document for the implementation of SPD has been prepared

LEGAL FRAMEWORK- CURRENT STATUS OF AAQD IMPLEMENTATION

Highest level competence on air quality legislation in Bosnia and Herzegovina has entity governments. Brcko District has its own competence on air quality management and legislation.

Most of the competence on air quality management has lower administrative units – municipalities and, in Federation of BiH – cantons.

Federation of BiH:

Air protection law (Official gazzete of FBiH 33/03, 4/10) / Zakon o zaštiti zraka

Rulebook on the manner of monitoring air quality and defining the types of pollutants, limit values and other air quality standards (Off.gaz.FBiH 1/12)

/ Pravilnik o načinu vršenja monitoringa kvaliteta zraka i definiranju vrsta zagađujućih materija, graničnih vrijednosti i drugih standarda kvaliteta zraka

LEGAL FRAMEWORK:

Republika Srpska:

Air protection law (Official gazete of RS 124/11) / Zakon o zaštiti vazduha

Decree on conditions for air quality monitoring (Off.gaz.RS 124/12) / Uredba o uslovima za monitoring kvaliteta vazduha

Decree on the establishment of a national network of measuring stations (Off.gaz.RS 124/12) / Uredba o uspostavljanju republičke mreže mjernih stanica

Regulation on air quality values (Off.gaz.RS 124/12) / Uredba o vrijednostima kvaliteta vazduha

Regulation on the zones and agglomerations (Off.gaz.RS 100/12) / Uredba o zonama i aglomeracijama

Above mentioned regulations, both in Federation and Republic of Srpska, generally are aligned with 2008/50 “CAFE” directive.

IMPLEMENTATION OF THE DIRECTIVE IN LOCAL REGULATIONS:

General provisions, subject matter and definitions from the directive are mostly aligned in local regulations, but...

Responsibilities (article 3.):

Member States shall designate at the appropriate levels the competent authorities and bodies responsible for the following: (a) assessment of ambient air quality; (b) approval of measurement systems (methods, equipment, networks and laboratories); (c) ensuring the accuracy of measurements; (d) analysis of assessment methods; (e) coordination on their territory if Community-wide quality assurance programmes are being organized by the Commission; (f) cooperation with the other Member States and the Commission.

- ***In Bosnia case state has responsibilities on this issue, entity governments has to designate two (2) Reference laboratories for this issues - most probably entity Hidrometeorological Institutes which already are designated for some of mentioned activities. (This is supported by IMPAQ project in which cooperate institutions from BiH and Sweden)***

IMPLEMENTATION OF THE DIRECTIVE IN LOCAL REGULATIONS:

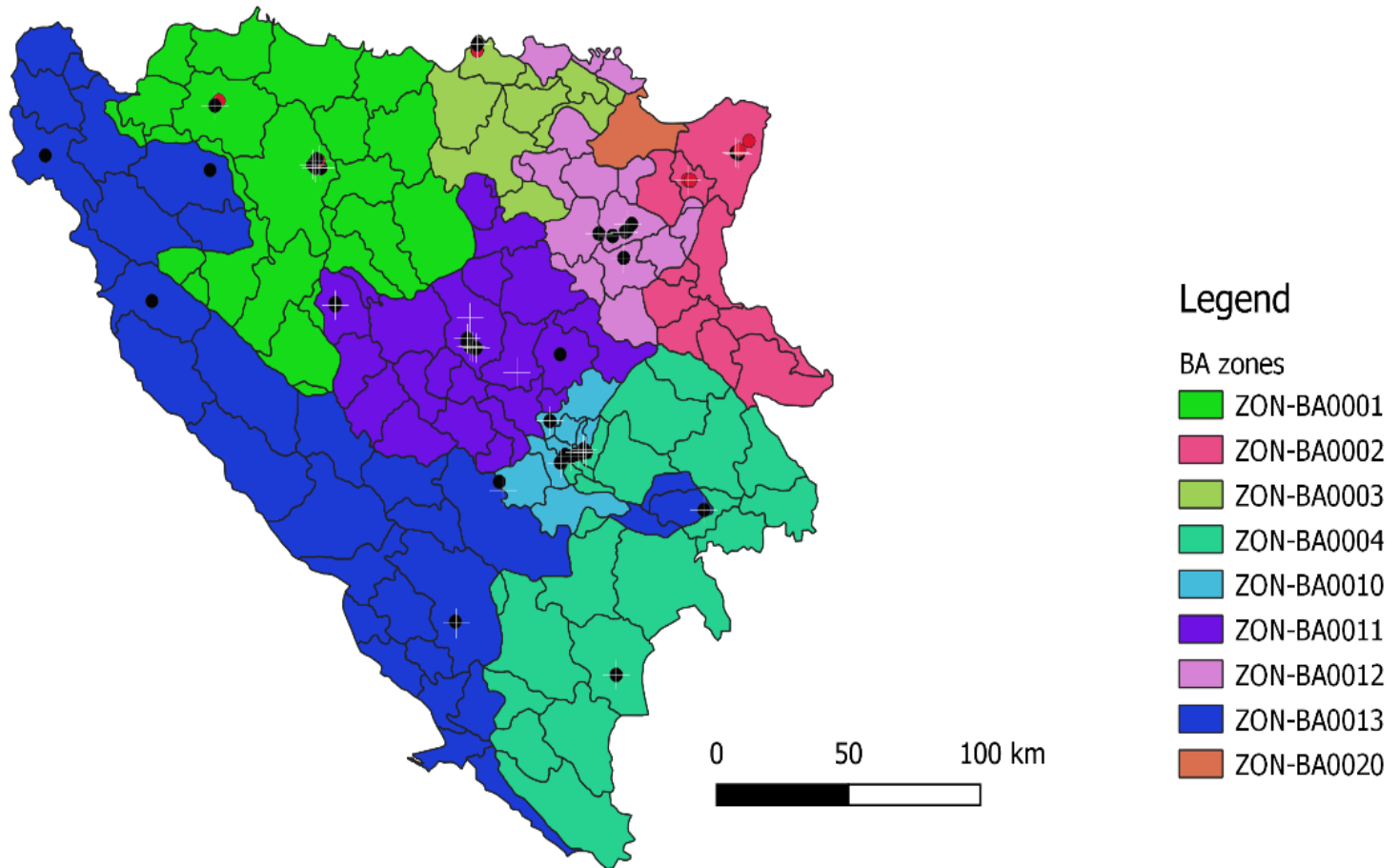
Article 4. Zones and agglomerations – yet not determined in accord to Directive.

Republic of Srpska had determined agglomerations few years ago, but not aligned with definitions from Directive.

In 2020. proposal of zones and agglomerations in B&H, aligned with the Directive is in final phase of preparation. (Local Hidromets and Swedish SEPA – IMPAQ project) .

Some of zones and agglomeration already meets the needs of AQ monitoring but some will need more investments in AQ station networks.

PROPOSAL OF ZONES AND AGGLOMERATIONS OF BOSNIA AND HERZEGOVINA:



IMPLEMENTATION OF THE DIRECTIVE IN LOCAL REGULATIONS:

Chapter 2. Assessment of ambient air quality; Assessment regime and assessment criteria:

It is described in local legislative but not implemented – needs determined zones and agglomerations. Also needs high good quality data coverage for a few years in row from monitoring sites which is often not a case.

Chapter 3. and 4. Ambient air quality management and Plans – described in local legislation aligned with the Directive.

Some Cantons and municipalities making own plans, but without coordination with higher administration unit management and plans, and hard to evaluate results.

Chapter 5. Information and Reporting – implementation is getting better , especially in Federation of BiH. Daily reports are provided from FHMI, media contacts and reports, mobil applications, social network. Annual reports yet do not contains Plans and Assessments.

Specific air quality index is in force in Federation of BiH, probably will be same methodology in RS too. www.zrakubih.ba. IMPAQ project

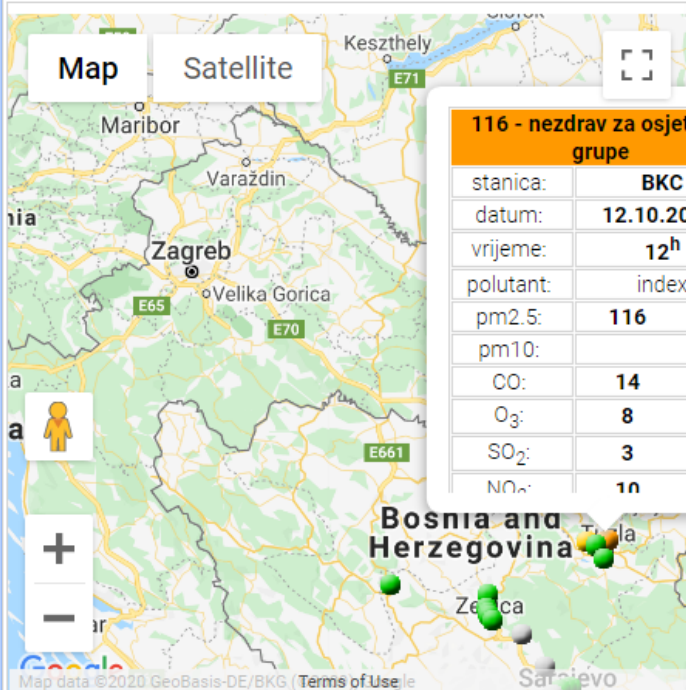
Reports to EEA /EIONET are implemented but in limited format (technical data of networks and measuring sites, measured concentrations, real time data)

AUTOMATSKE MJERNE STANICE

12.10.2020. u 12^h

početna kvaliteta zraka indeks kvaliteta zraka za 12.10.2020.u12^h

INDEKS KVALITETA ZRAKA



PROSJEČNE SATNE VRIJEDNOSTI POLUTANATA

LOKACIJA	SO ₂	H ₂ S	NO ₂	NO _x	NO	CO	O ₃	PM ₁₀	PM _{2.5}
SARAJEVO	Ambasada SAD								
	Bjelave	#		19	33	14	#	17	7
	IvanSedlo	11	#	#	#			22	7
	Vijećnica	19		22	33	11	440	#	2
	Otoka	58		32	57	24		8	7
ILIJAS	Ilidža	71	#	26	28	18	379	9	8
	Ilijaš	9		16	18	3			14
VISOKO	Centar	69	12					23	11
KAKANJ	Doboj								
	Brist	23		3	11	8		20	3
	Tetovo	15		25	92	44	634	59	28
	Centar	35		#	5	3	465	38	23
	Radakovo	50		56	68	8	489	61	#
ZENICA	Vranduk	3						33	2
	Maglaj	62	2					47	15
MAGLAJ	Maglaj	62	2					47	15
JAJCE	Harmani	5		#	#	#		10	9
GORAŽDE	Rasadnik	8		25	128	104	1242	2	48
	Skver	13		17			2546	29	11
TUZLA	BKC	7		13			1393	20	9
	Bukinje	6		8			1298	#	#
	Centar	117		26			1453	#	35
ŽIVINICE	Centar	117		26			1453	#	35
LUKAVAC	Centar	33		26			2193	#	9

nema mjerenja			
dobar	0 - 50	umjeren	51 - 100
nezdrav za osjetljive grupe	101 - 150	nezdrav	151 - 200
veoma nezdrav	201 - 300	opasan	301 - 500

granična vrijednost		tolerantna vrijednost		prag upozorenja		prag uzbune		ne mjeri se	nema podataka #
SO ₂	350	SO ₂	365	SO ₂	365	SO ₂	500		
NO ₂	200	NO ₂	210	NO ₂	210	NO ₂	400		
H ₂ S	7	H ₂ S	10	H ₂ S	-	H ₂ S	-		

Podaci se automatski objavljuju sa mjernih mjesta i nisu kontrolirani i validirani

EIONET

Central Data Repository

You are here: [Eionet](#) » [CDR](#) » [Bosnia and Herzegovina](#) » [European Union \(EU\), obligations](#) » [Reporting under air quality directives 2004/107/EC and 2008/50/EC](#) » [Bosnia and Herzegovina meta data \(D\) AQ 2019](#)

(D) Information on the assessment methods (Articles 8 and 9) »

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Bosnia and Herzegovina meta data (D) AQ 2019

[Zip envelope](#)

Description

Obligations [\(D\) Information on the assessment methods \(Articles 8 and 9\) - for fixed and indicative measurements](#)

Period 2019 - Not applicable

Coverage Bosnia and Herzegovina


Reported 29 Sep 2020 13:17

Status Envelope is complete (Technically accepted)





Note

If you want to stay updated about events in this envelope [Subscribe to receive notifications](#) for this country and the current dataflow(s).

Files in this envelope

1  [dataflow_D_BiH_2019.xml](#) | *Bosnia and Herzegovina meta data (D) AQ 2019* | 29 Sep 2020 | 1.20 MB

Feedback for this envelope

-  [AutomaticQA result for file dataflow_D_BiH_2019.xml: Check Obligations](#) (Posted automatically on 29 Sep 2020)
-  [AutomaticQA result for file dataflow_D_BiH_2019.xml: XML Schema validation](#) (Posted automatically on 29 Sep 2020)
-  [AutomaticQA result for: AirQuality_Dataflow D](#) (Posted automatically on 29 Sep 2020)
-  [Confirmation of receipt](#) (Posted automatically on 29 Sep 2020)
-  [Technically accepted](#) (Posted automatically on 29 Sep 2020)

IMPLEMENTATION OF THE DIRECTIVE IN LOCAL REGULATIONS:

Other:

Reference methods are aligned to the Directive

Limit values, tolerant values are aligned to the Directive

Data quality objectives are aligned to the Directive etc.

all the Annexes of the Directive are described in local legislative like it is in the Directive

In some areas (Canton Sarajevo) local warning and alert threshold for PM particles are determined.

Measurements are limited – SO₂, O₃, PM₁₀, PM_{2.5M}, CO, H₂S, NO_x

Sampling and analysis of particle matter, benzo(a)pyren, heavy metals are very rare.

All institutions involved in AQ monitoring are undercapaciteted and facing financial problems.

PROGRESS ACHIEVED UNDER IMPAQ PROJECT

There are activities on establishing and designating two reference laboratories in both entities of BiH

Quality assurance / Quality control manual for performing air quality monitoring is in final phase of preparation

Zones and agglomeration document which will be sent to entity governments on adoption is in preparation

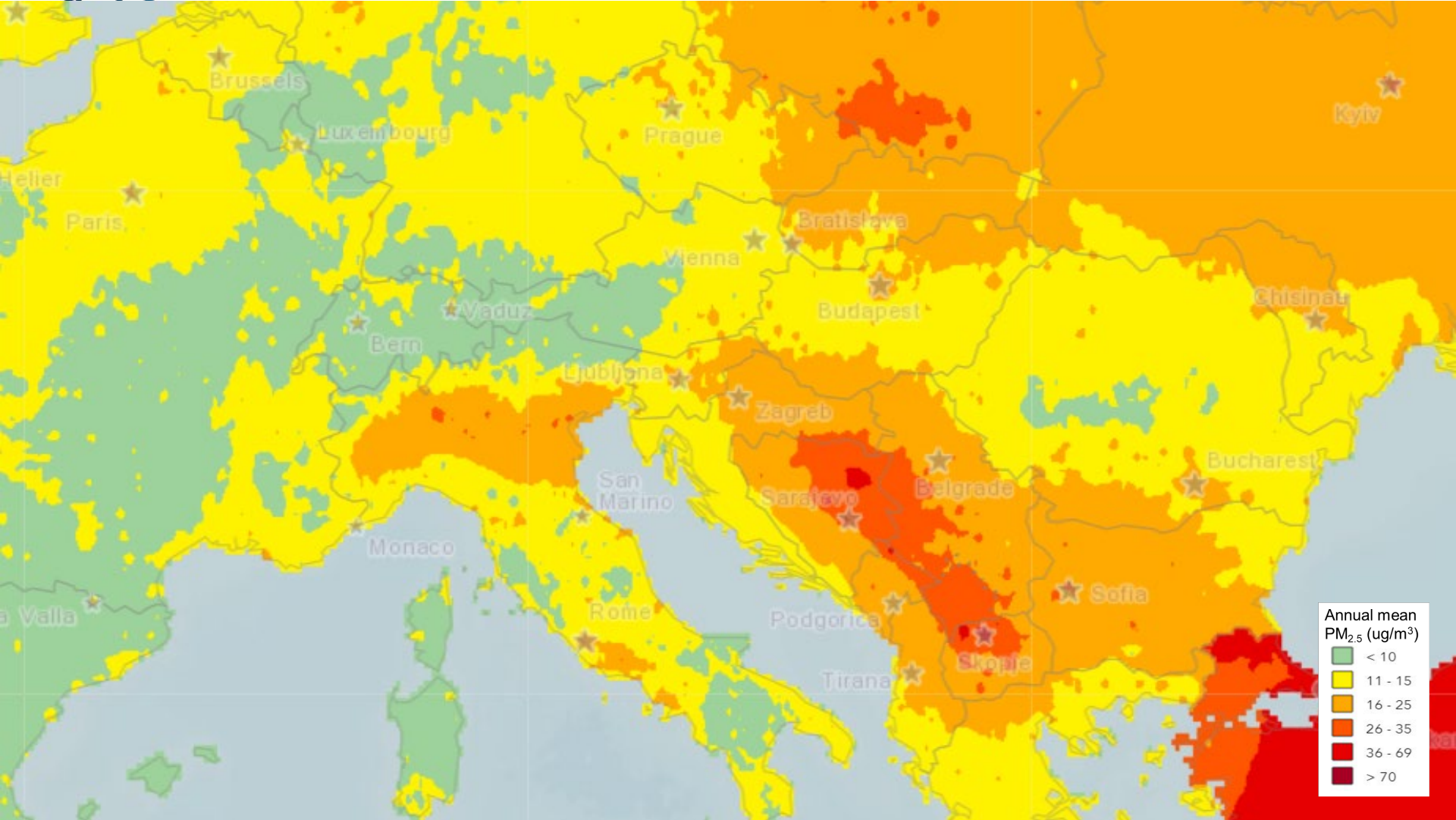
BACKGROUND- WB AIR POLLUTION MANAGEMENT PROJECT

- Between 2018 – 2019, the World Bank conducted analytical work on air pollution in three Western Balkan countries
 1. North Macedonia,
 2. Kosovo, and
 3. Bosnia and Herzegovina.
- **The studies covered – *inter alia* – analyses of source apportionment, health analytics, economic assessment of the welfare costs of air pollution (Cost of Environmental Degradation), and simulations of impacts of selected policy reforms**
- **Motivation: to provide a better understanding of the sources, health impacts, and welfare costs of air pollution as well as possible policy reform options**

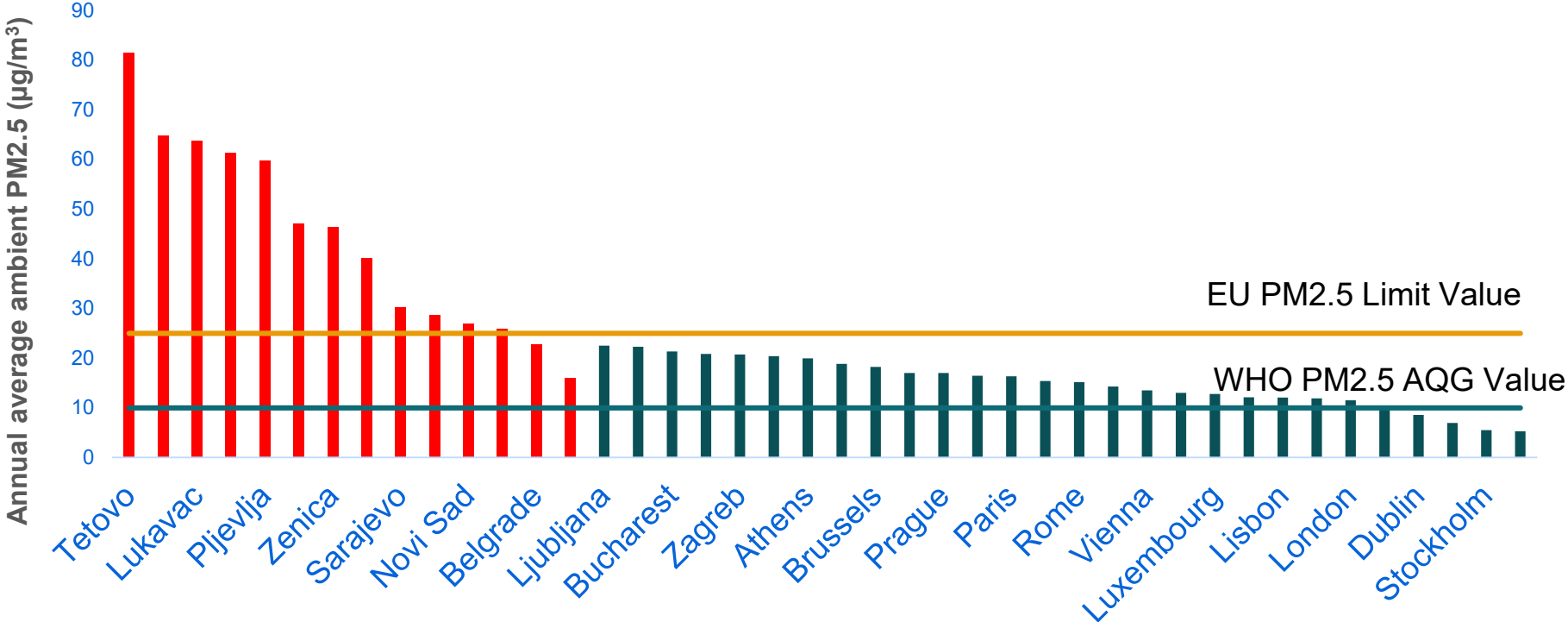


THE WORLD BANK

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AIR POLLUTION LEVELS IN SELECTED WESTERN BALKAN CITIES



**4.2 милиони луѓе умираат од
аерозагадувањето годишно,
Мантованели: Владата да премине на
конкретни чекори**

**Регионална конференција:
„Управување со квалитетот на
воздухот (AQМ) во регионот на
Балкан – Прашања, решенија и
можности за финансирање“**

What is the Number of People who die of Pollution in Bosnia and Herzegovina?

NOVEMBER 24, 2019 4:00 PM



**е мобилизира за заеднички
решување со загадениот воздух**

BalkanInsight
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**Balkan Coal Power Plants Failing
Toxic Emissions Targets**

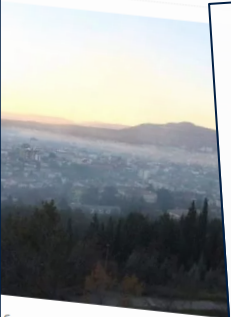
Sinisa Jakov Marusic | Skopje

**Public anger as air pollution in Western
Balkan cities worsens**

Public anger as air pollution in Western Balkan cities worsens, a study says

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Public anger as air pollution in Western Balkan cities worsens, a study says



**Campaigners demand EU action against
Western Balkan heavy polluters**

Maja Zurela

SARAJEVO (Reuters) - Most Western Balkan countries have failed to fulfill the first requirement to meet European Union industrial emissions standards despite commitments governments made in 2005, environmental campaigners warned on Tuesday.



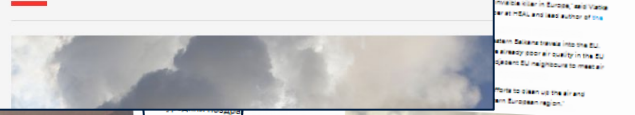
EU must act on 'killer' Western Balkan coal pollution

Outdated coal power plants in the Western Balkans are one of Europe's main sources of air pollution, damaging health and finances across the EU, a new report says.



UN: Balkans faces alarming levels of air pollution

By SABINA NIKSIC June 3, 2019



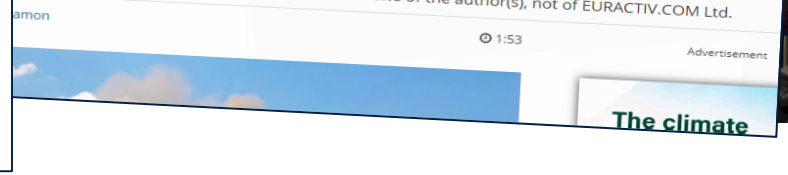
Home / Opinions / Energy & Environment / Energy / Energy transition / Coal pollution in the Western Balkans is a European problem

Coal pollution in the Western Balkans is a European problem

DISCLAIMER: All opinions in this column reflect the views of the author(s), not of EURACTIV.COM Ltd.

Winter air pollution brings 'choking season' to Balkans

With the onset of winter, many Balkan cities, such as Belgrade, Sarajevo and Zagreb, become enveloped in a thick cloud of smog. But instead of tackling the problem, politicians are playing it down.



SOURCES OF AIR POLLUTION

Residential burning of solid fuels

- Need more stringent solid fuel quality standards: in RS, sulfur content for coal for household use (up to 2.5% by weight); compared to $\leq 0.7\%$ in Ireland

Power generation

- Burning of lignite coal

Industry

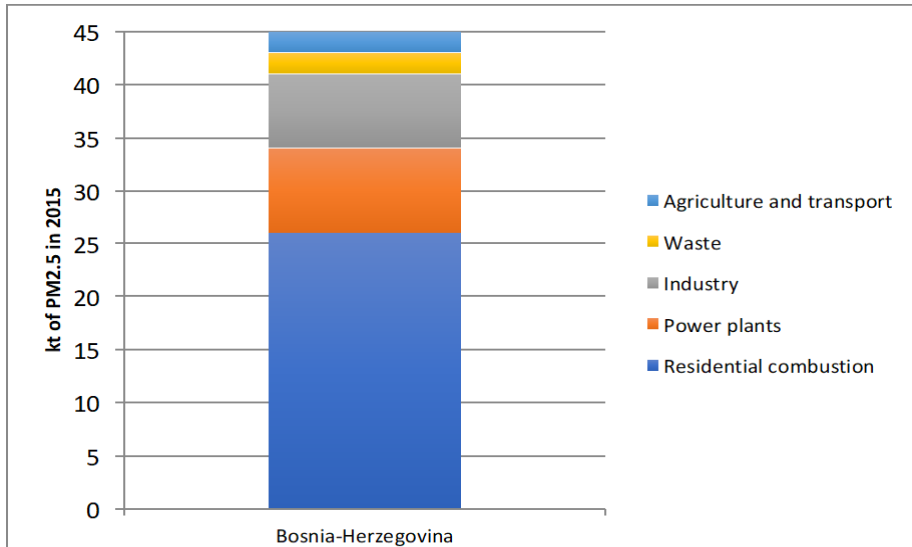
- e.g. ferro-alloys, cement production, iron and steel, chemicals, others

Transport

- Average vehicle age of 17 years; majority operating on diesel
- Light duty vehicle standards: Euro 3 (used vehicles); Euro 5 (new)
- Allowable sulfur content up to:
 - ➔ 350ppm (diesel);
 - ➔ 150ppm (gasoline);
 - ➔ compared to 10ppm (EU legislation)

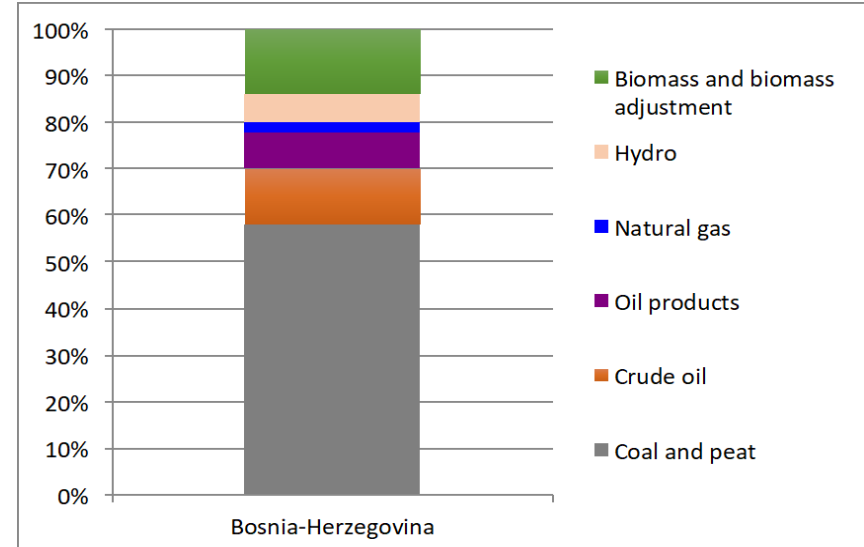
SOURCES OF PM2.5 EMISSIONS, 2015

Annual PM2.5 emissions by sector for all of BiH



Source: IIASA GAINS, 2018

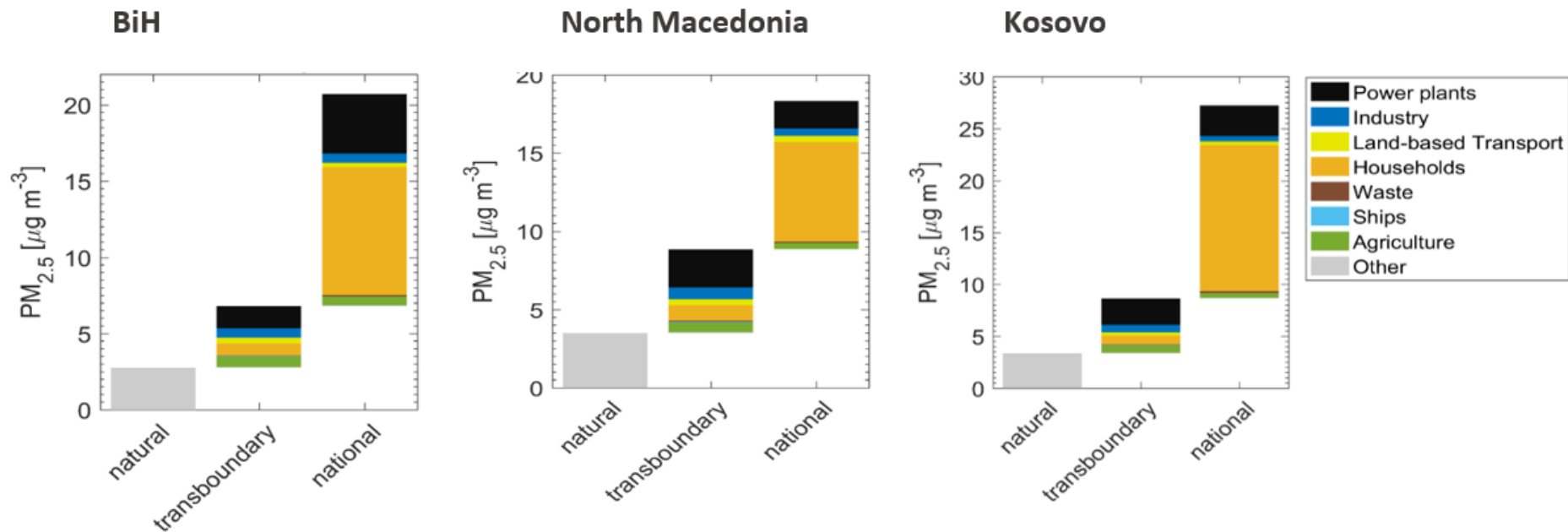
Primary energy supply in BiH



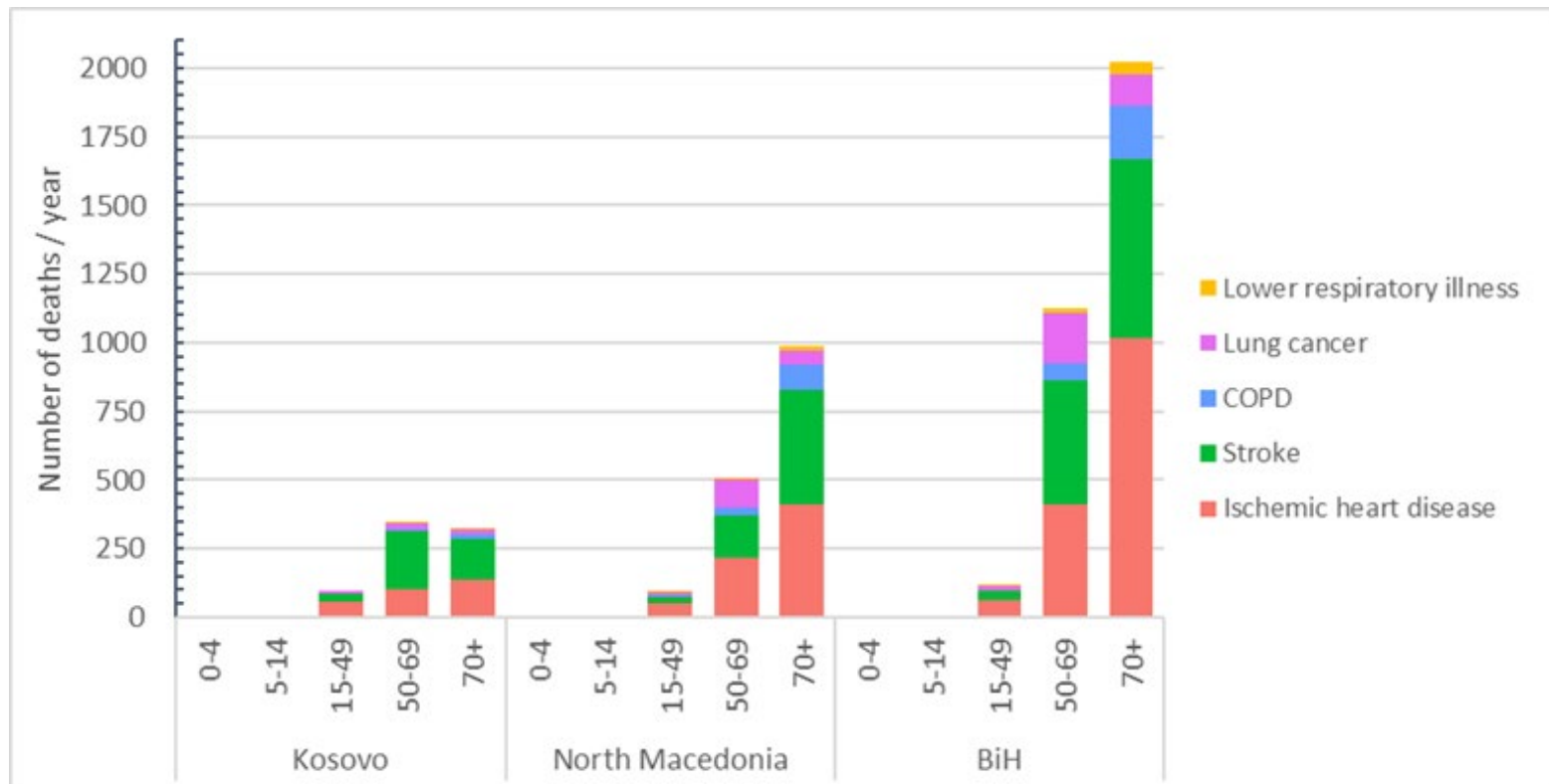
Source: World Bank, 2017

- Residential combustion contributing 58% of PM2.5 emissions
- Power and heating plants contributing 18%
- Industry contributing 14%
- Coal is responsible for more than 50% of the emissions from power plants and industry
- Biomass is responsible for most of residential PM2.5 emissions

AIR POLLUTION SOURCES IN WESTERN BALKAN

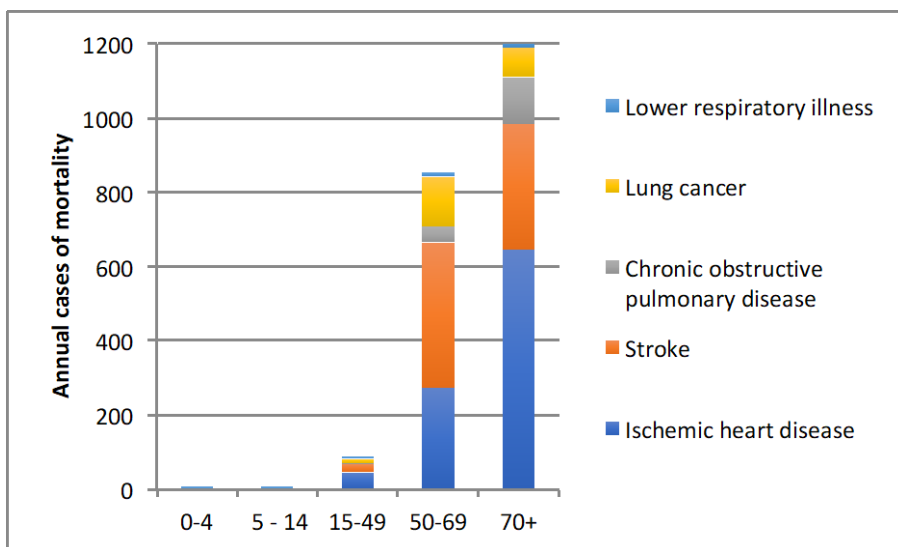


HEALTH BURDEN OF AIR POLLUTION

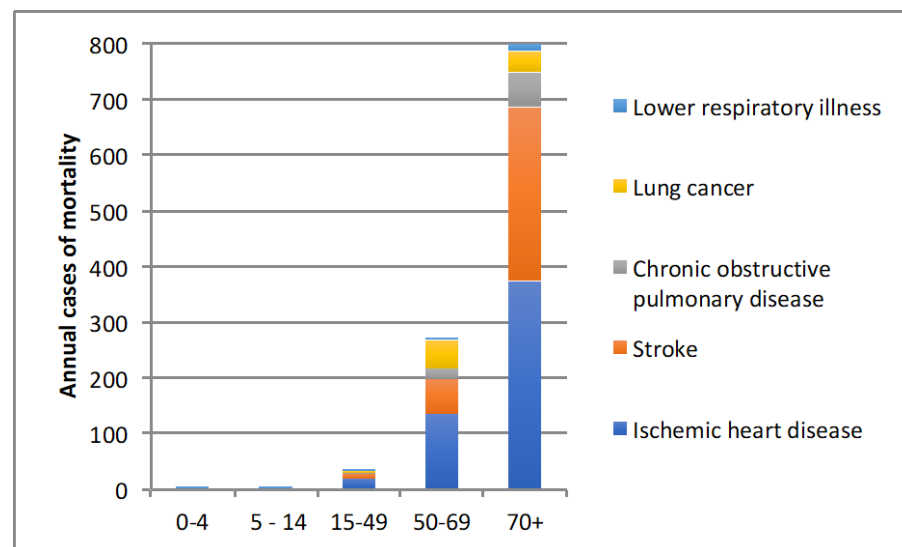


ANNUAL HEALTH BURDEN OF AAP IN BIH

Federation BiH

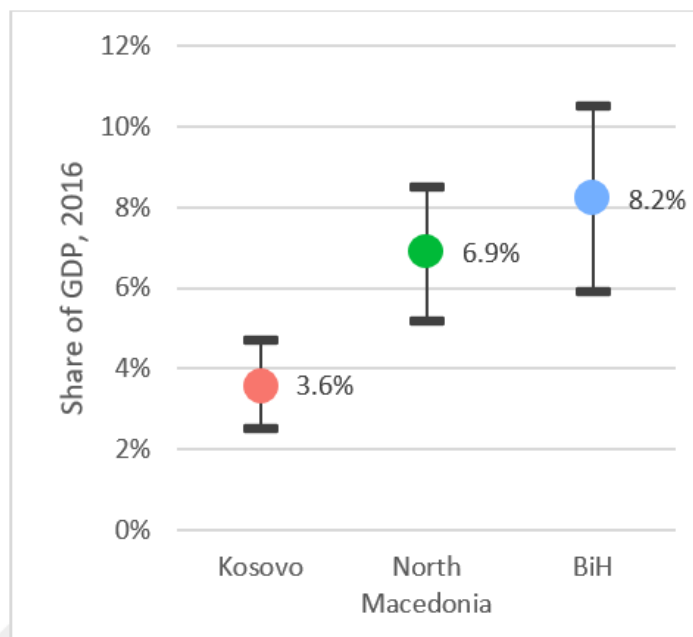
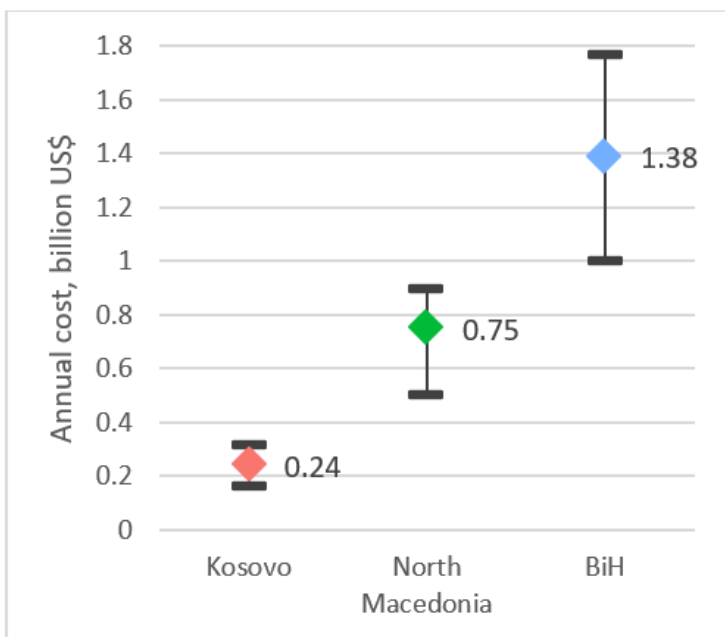


Republika Srpska



- 3,300 people die from diseases associated with AAP in BiH annually.
- About 81 % of deaths are from cardiovascular diseases.
- 68 % of Ischemic Heart Disease and 57 % of strokes are in people over 70 years of age.
- 16 % of the total health burden attributed to AAP originates in Sarajevo and Banja-Luka

ECONOMIC COSTS OF AIR POLLUTION



Country	US\$ (million)	Share of GDP
Kosovo	160 - 310	2.5 - 4.7
North Macedonia	500 - 900	5.2 - 8.5
BiH ³¹	1,000 - 1,800	5.9 - 10.5

ECONOMIC COST OF AAP IN BIH, BILLION US\$

	Value	High	Low
Federation BiH	0.92	1.17	0.66
Republika Srpska	0.47	0.60	0.34
BiH	1.38	1.77	1.00
% GDP equivalent in 2016	8.2%	10.5%	5.9%

- Federation BiH carries 67% of the cost burden
- Republika Srpska carries 33% of the cost burden
- Lack of data on Brčko District precluded valuation

SIMULATED IMPACTS OF SELECTED POLICY INTERVENTIONS

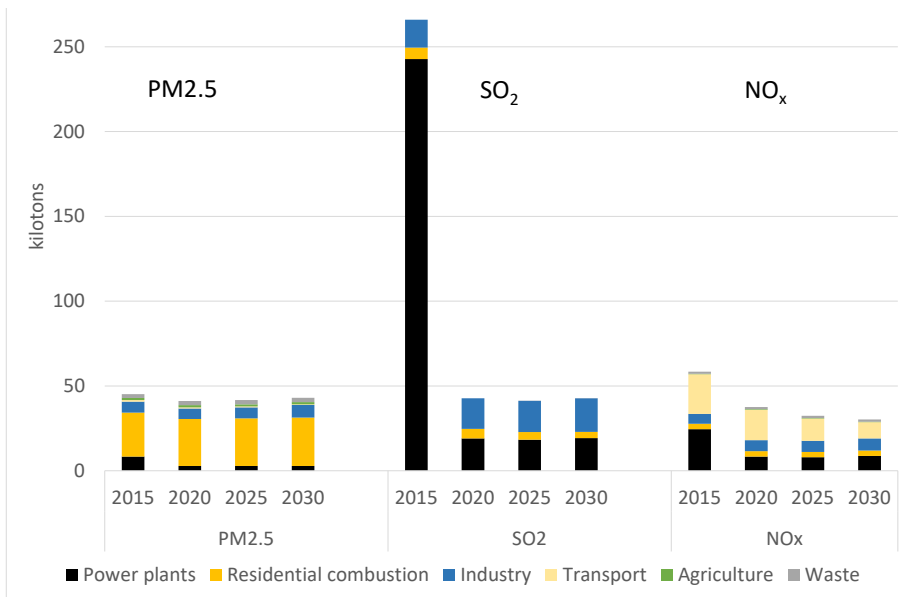
	Baseline Scenario	Maximum Mitigation Case Scenario
Sulfur Dioxide (SO₂)	80% emission reduction mainly in the power sector, due to EU legislation for combustion plants and emission standards for vehicles	Compared to baseline scenario, further mitigation in industrial sector.
Nitrogen Oxides (NO_x)	50% emission reduction mainly in the power and transport sector, due to EU legislation for combustion plants and emission standards for vehicles	Compared to baseline, further emission reduction of about 50% in power and industrial sector.
Particulate Matter with a diameter of 2.5 µm or less (PM_{2.5})	Modest emission reduction mainly in the power sector.	90% emission reduction mainly in residential combustion sector and industry.
Non-Methane Volatile Organic Compounds (NMVOC)	No emission reduction.	90% emission reduction mainly in residential sector.
Ammonia (NH₃)	No emission reduction.	Modest emission reduction.
Black Carbon (BC)	No emission reduction.	90% emission reduction mainly in residential combustion.

- **Baseline Scenario:** Development of emissions assuming compliance with the current environmental law.
- **Maximum mitigation case:** Emission reduction that could be achieved through immediate and full application of the best available technologies for all new equipment (does not consider the potential from changes in energy, agricultural, and transport policies).

BASELINE TRENDS TO 2030 - CURRENT LEGISLATION

BOSNIA-HERZEGOVINA

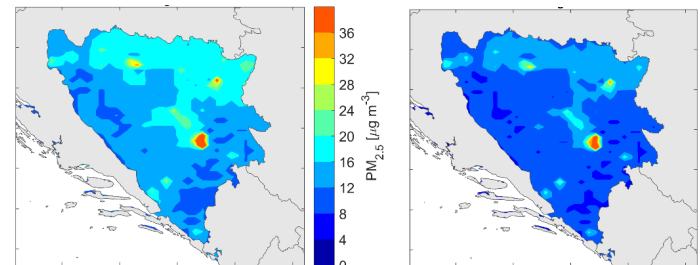
Baseline emissions under current legislation



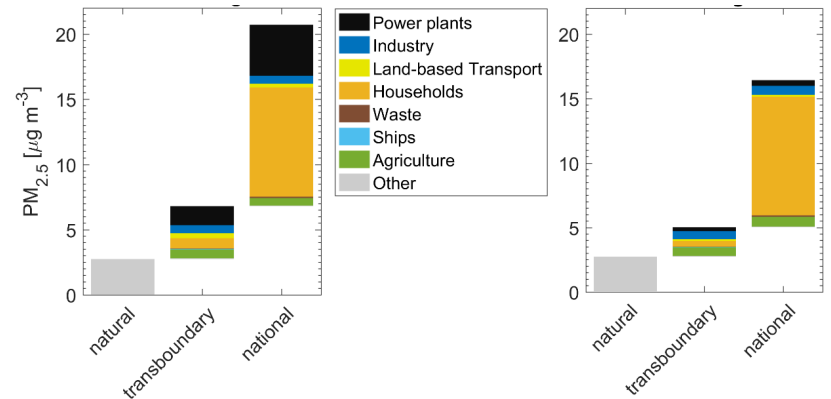
Ambient PM2.5

2015

2030

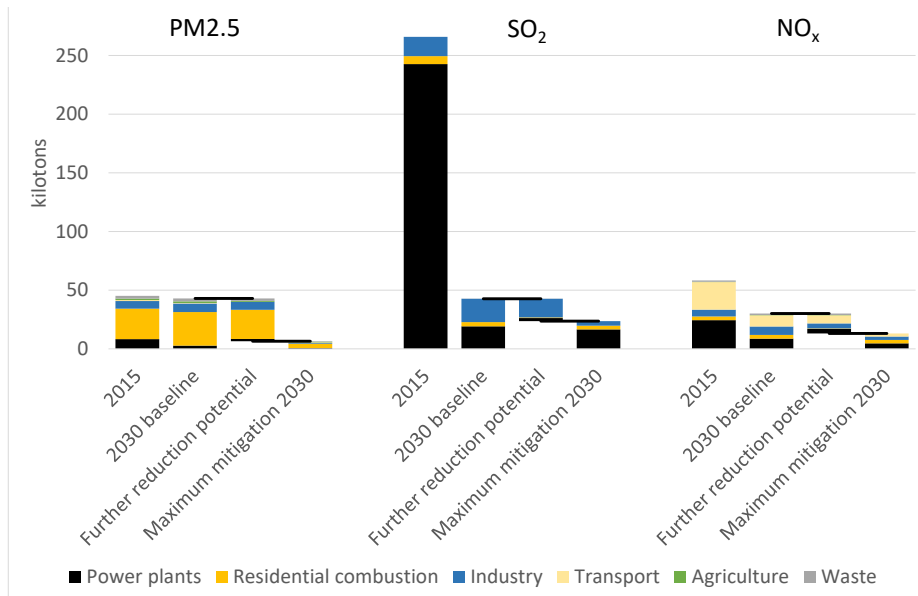


Source apportionment for population exposure to PM2.5



Impact of further Policy Interventions

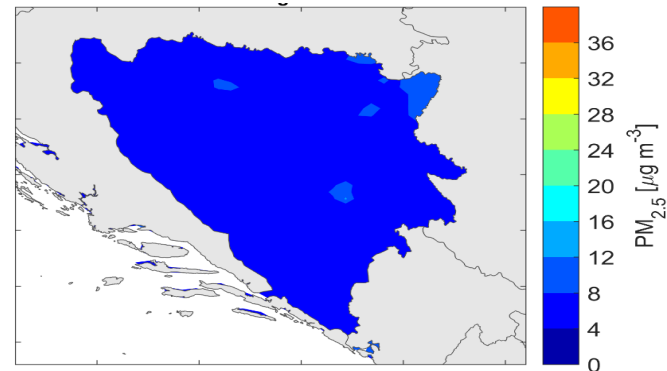
Emissions and control potentials



Key measures

- EU Eco-design standards for all new stoves and boilers burning fuel wood
- Accelerated replacement of the oldest installations
- Assurance of adequate quality of fuelwood
- EU Industrial Emissions Directive (IED) standards to all new industrial installations

Ambient PM2.5 achievable in 2030



Institutional Aspects of AQM

1. Air quality monitoring challenges

- Most stations monitor PM10 and not PM2.5
- Intermittent operation of monitoring stations due to budgetary and administrative shortcomings
- Lack of time series data to facilitate trends analysis
- Need to harmonize procedures, QA/QC among different operators
- Absence of reference laboratory

2. No national level emissions inventory

- Industrial inventory prepared in 2016; shortcomings include lack of data verification mechanisms, incompleteness of data
- Pollutant Release and Transfer Register (PRTR) is incomplete and not publicly accessible

3. Legislative aspects

- Key EU legislation yet to be fully transposed nationally
- Different timeframes for AP Strategies: FBiH (10); RS (6)

4. Organizational

- Lack of clear coordination mechanisms
- Insufficient budgets (inter-entity body not legally binding)
- Under-staffed of key agencies

5. Inspection and enforcement

- Low levels of compliance
- Few environmental inspectors; verification of reported emissions is weak
- Municipalities do not have permitting or inspection function

6. Need to strengthen AQM instruments

- FBiH: pollution fees have not been adjusted since 2011
- RS:, environmental fees are not operational
- Euro 3, 4 and 5 vehicles pay same environmental fees

Measures to Improve AQM

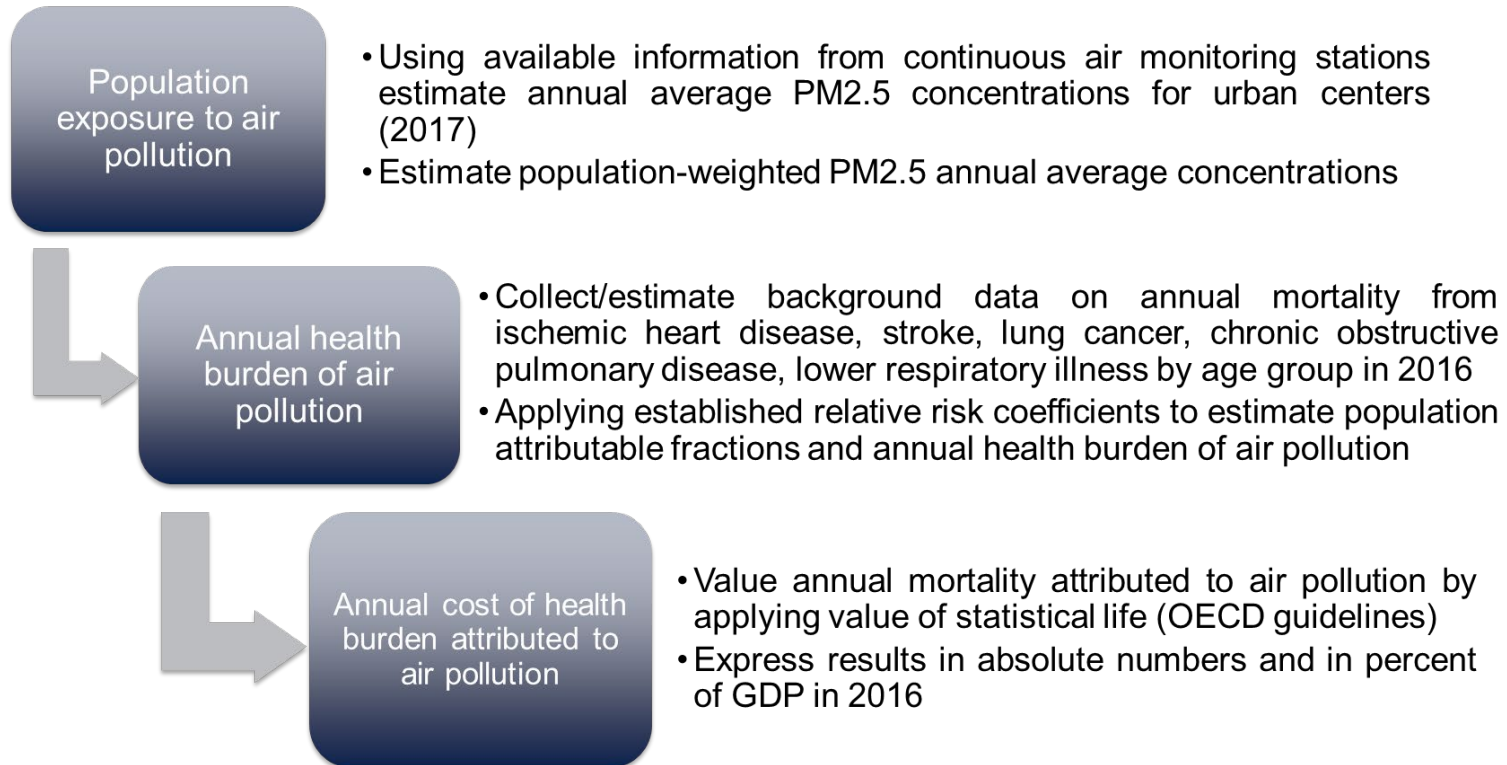
General:

- Reliable Air quality monitoring
- Develop national emissions inventory
- Strengthen and harmonize legal frameworks across country
- Strengthen Inspection and Enforcement
- Diversify instruments for AQM

Sectoral:

- Use Cost-Benefit Analysis for prioritizing and selecting interventions to reduce AAP
- Residential
- Mobile Sources
- Stationary Sources

METHODOLOGY



The IMPAQ project

SUPPORT TO BOSNIA AND HERZEGOVINA IN IMPROVING AIR QUALITY AND AIR MANAGEMENT is funded by the Swedish Government and is being implemented by the Swedish Environmental Protection Agency (SEPA). The program is a partnership between various institutions, authorities and ministries BiH, and aims to strengthen the capacity of relevant institutions to better manage air quality data and to improve air quality throughout the country.

The project activities will equip individuals, companies, policy makers and the international community with the tools they need to make change and improve air quality in BiH.

Objectives of the IMPAQ project:

- Build a system for storing, publicizing and reporting on air quality data by developing a data host and a website for real time data;
- Improve laboratory capacities for verifying air quality data;
- Create emissions inventories to better understand the pollutants in the air;
- Identify sources of air pollution through source apportionment analysis;
- Strengthen the existing system for environmental regulation by providing training for environmental inspectors;
- Develop plans and make recommendations for activities for improving air quality in Sarajevo and Banja Luka;
- Spread accurate information about air quality through information campaigns.

It will also set BiH on a path to becoming an EU member state

ACIVITIES

Outcome 1: National AQ Data Host

1. EU compliant zones and agglomerations.
 - seeking to maintain an build on current monitoring system.
2. Organization of existing monitoring capabilities.
 - Optimize monitoring network system, add new capacity where needed, repair and replace, maintenance.

Create a harmonized database for storing air quality data.

- Utilizing existing systems and functions in best way possible

ACTIVITIES

Outcome 2: National AQ Reference Laboratory

1. Ambition: Establish a formal mandate for two reference laboratories to collectively comply with the EU's air quality directive.
2. Equip the laboratory(s) with a complete range of measurement capabilities with identical equipment for both Entities to furthest extent possible.
3. Monitor and oversee work the laboratory technicians.
4. Ensure data validation

ACTIVITIES

Outcome 3: Emissions inventories and source apportionment study in five major cities

1. External partner to carry out a 1-year source apportionment study.
2. Six cities, three per entity, produced by external partner
3. Disseminate the results.

ACTIVITIES

Outcome 4: Cost-effective and scalable air quality improvement activity(s)

1. Develop and expand traffic free zones in Sarajevo city and Banja Luka.
 - feasibility and sensitivity studies on assumed changes in traffic patterns by expanding on traffic free zones and possibly rerouting some traffic.
 - Train technicians

ACTIVITIES

Outcome 5: Information campaign regarding air quality and public health

1. Using the results of the source apportionment study (outcome 3), and final results to strategize the most critical issues to inform the general public and relevant actors.
2. Work with a communications agency to design an information campaign.
 - SEPA expertise
 - Actors present in BiH
3. Carry out information campaign. www.zrakubih.ba.
 - Two phases

ACTIVITIES

Outcome 6: Legislation implementation

1. Secondment of an inspector from a municipality in Sweden.
2. Needs-assessment regarding entity-level inspectors in collaboration with responsible inspectorates
3. Hire and train 4 inspectors (2 per entity).
4. Explore/secure means for continued funding after programme ending.

Data Use for Environment and Health Policies

Regional symposium on air quality in cities 30. and 31. janury 2020, Sarajevo

Establishment of the Air Quality Management Center in Sarajevo

In the post-war period of Sarajevo, although relatively significant funds are allocated for this purpose, there was no political will for better work on air quality. The activity was limited to monitoring air quality and air emissions without significant linkage with these activities and other development segments. Certain remedial measures were proposed but without introducing quantitative indicators. The collected data on emissions and air quality were neither sufficiently processed nor used.

The current Sarajevo Canton authorities have decided to improve the effectiveness of the work on protection of ambient air from pollution by taking over part of the activities so far carried out by outside organizations, to be performed by professionals employed at the Center, and including those activities that have not been performed so far.

It is envisaged that the employees of the Center cover five groups of jobs:

- (1) emissions (furnaces, traffic, energy, energy efficiency, market, inspection),
- (2) modeling of the flow and dispersion of pollutants,
- (3) air quality (air quality monitoring, including meteorological parameters - real and integrated data) and health impacts (using mathematical models and based on national health statistics),
- (4) public relations, and
- (5) international cooperation, internal and external education.

The basic features of the system are cooperation with all sectors of the Cantonal Government, more efficient usage of data, and evaluation of each measure through the expected change in air quality and through the evaluation of health impacts.

Putting in place measures to strengthen enforcement of regulations related to AQM, particularly at the sub-entity level, is crucial for improving the effectiveness of the government's efforts to tackle air pollution.

There is a need to strengthen inspection at the municipal level, increase the number of inspectors and provide them with training and resources to conduct field investigations. Also, there is

- need to build capacity for third-party verification of emissions reported by polluters.
- Given the prominent role of domestic heating in air pollution, efforts should be made to legally allow for household inspections to be conducted, to further strengthen such inspections, and
- increase public awareness, targeted to households, on air pollution and low-emission practices for household heating.
- Tested approaches to reinforcing compliance and enforcement include public disclosure of emitters' environmental compliance,
- judicial action, and increasing fines and expanding the range of sanctions for non-compliance, potentially
- including civil, judicial or administrative, as well as criminal enforcement on legal representatives of a
- polluting entity.

Current air quality monitoring efforts can be improved through investments in more robust systems for

- **air quality monitoring, data analysis and management and capturing emission sources.** Efforts to
- establish a reliable air quality monitoring network should prioritize a focus on pollutants that are critical
- to health, and increased geographic and time series coverage, notably of PM2.5.

To better understand the health impacts of AAP on its population, Bosnia and Herzegovina needs to strengthen health statistics and harmonize country reporting with international systems of disease classification.

- This facilitate ready estimation of health impacts of AAP and strengthen the knowledge and information base for decision-making to reduce air pollution. Furthermore, it will enable the country to assess its progress in reducing premature mortality from AAP. Notably, at the country level, the government should strengthen the health information system and make it consistent with the International Statistical Classification of Diseases and Related Health Problems.
- Data such as bronchitis prevalence for children, COPD in adults, hospital admissions for cardiovascular and respiratory illness and lost work days should be collected to support analysis of morbidity associated with exposure to AAP.
- Lastly, the government should develop and strengthen capacity for conducting environmental health risk assessment to analyze health effects associated with stationary emission sources e.g. industrial facilities.