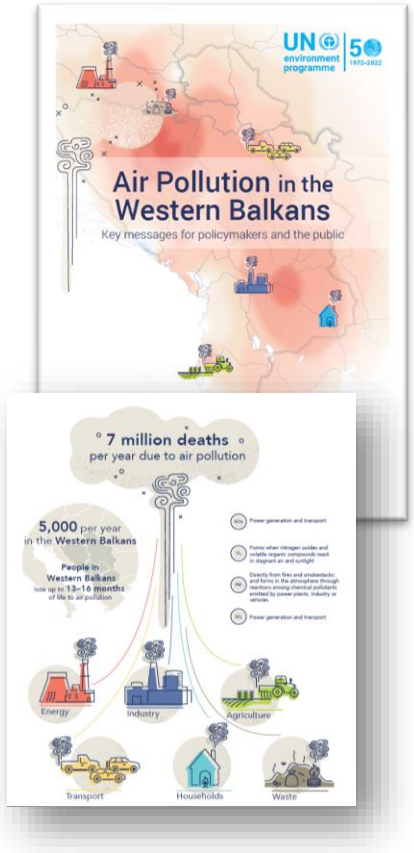
UNEP's regional activities addressing emissions from municipal waste burning, agricultural residue burning and domestic heating

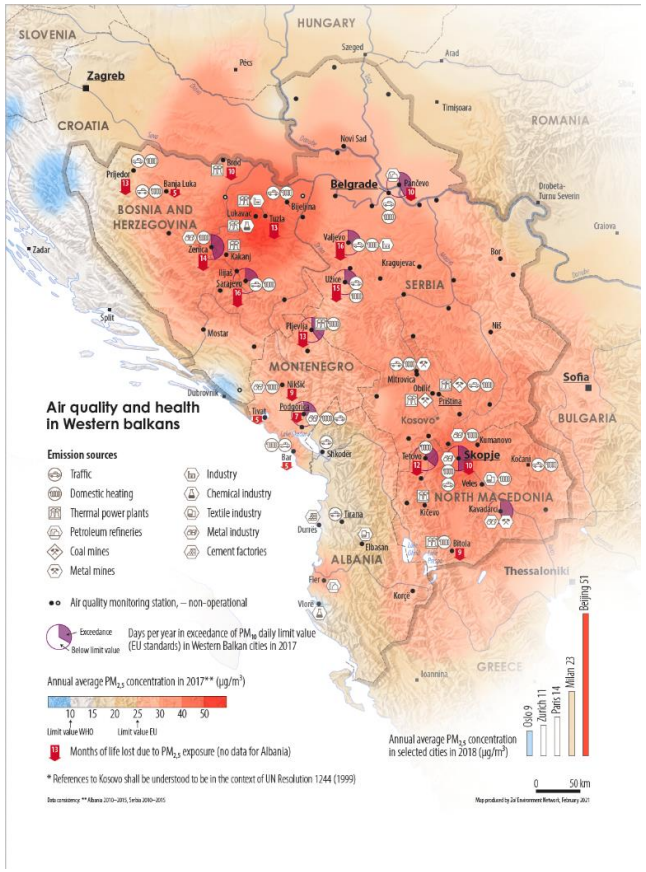
10th Annual Meeting of the Task Force on Techno-Economic Issues under CLRTAP

Tomas Marques, Regional Sub-Programme Coordinator, Chemicals and Polluton Action, UNEP Europe Office
17 October 2024

Air Pollution in the Western Balkans

Under the framework of the South-East Europe (de)Pollution Platform (SEEPP)





- 2018 Ministerial Conference on Innovative Solutions to Pollution in South-East Europe, held in Belgrade
- First regional study that quantifies the impact of air pollution on human health, considering 19 representative towns and cities across the region
- In collaboration with WHO European Center for Environment and Health (Bonn)
- Follow-up: Policy action for mitigating health impacts of air pollution from high-impact sectors

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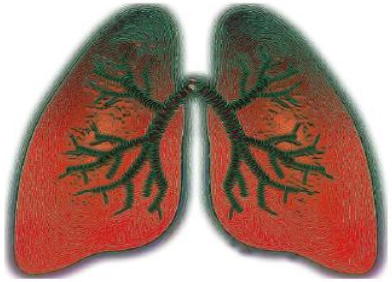
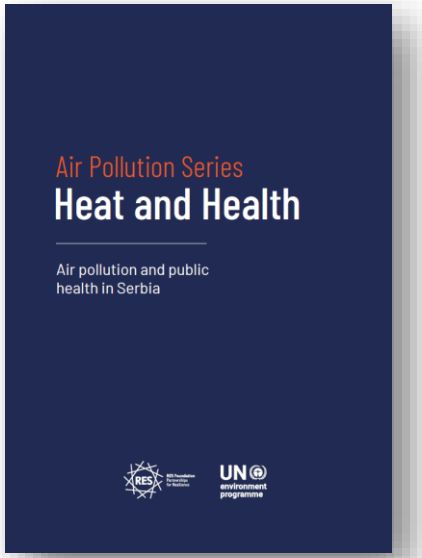
Air Pollution in Serbia

In relation to heating



HEAT AND HEALTH

Knowledge products on health and air pollution stemming from the inefficient combustion of household devices for solid fuel-burning



- Serbia has the second highest number of years of life lost (YLL) per 100,000 inhabitants, due to PM2.5 exposure, among 41 ranked jurisdictions in Europe (EEA report 2022).
- Almost **1,000,000** households in Serbia use inefficient solid fuel individual heating and cooking devices. There is limited awareness of users, but also health professionals, on how polluting these devices are and what are the alternatives.
- Actions that reduce concentrations of PM2.5 by 10 µg/m3 can halve the air pollution.

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Air Pollution in Serbia

UN Joint Framework for Action on Air Pollution from Residential Heating

- … better targeting of beneficiaries through subsidy schemes to include socially vulnerable and energy poor
- … the local level capacities to effectively utilise and implement the disposed funds
- … monitoring and evaluation of the National Air Quality Programme implementation, including at the local level
- … awareness programmes to showcase the benefits of air quality policies and EU eco standards to generate policy demand
- … support knowledge creation on air pollution impacts and alternatives through formal and informal education and training

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Air Pollution in Serbia

in relation to Waste Management

Available at: https://wedocs.unep.org/20.500.11822/45428

- First study linking landfill fires with air pollution and consequent impacts to human health.

- **Conclusions and recommendations:**

- ❑ 01 - Prevent landfill fires
- ❑ 02 - Minimize the consequences of Landfill fires
- ❑ 03 - Improve the monitoring system in order to assess the Impact of Landfill Fires on Air pollution in Serbia
- ❑ 04 - Reduce the risk to public health during and after fire occurrences

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Air Pollution in Serbia

in relation to Waste Management

Innovative circular economy approaches for better air quality

Analized challenges:

- Constant increase in recorded fires at landfills reaching 1,760 in 2022 (Ministry of Interior database).
- Limited coverage of municipal waste collection system (86.4%/2020, of which only 20% ends up in sanitary landfills)
- High content of biodegradable waste (48%/2020)
- Limited capacities and funding for the operation of mobile ecotoxicological units.
- There is no dedicated ambient air quality monitoring within national or local ambient air networks close to landfills, except in Belgrade (close to the largest municipal unsanitary landfill in Europe - Vinca) which does not monitor uPOPs – PCDD/PCDFs and dioxin-like PCBs.
- There are no Standard Operative Procedures.

- New multicountry inter-regional Initiative
- **Target countries**: Serbia, Bosnia and Herzegovina, and India
- Implementation timeframe: 2024 - 2027

Objective

➢ To promote policy solutions for circularity and sound agricultural and municipal waste management for improved urban air quality and resilience to health, economic and social shocks in selected beneficiary countries in Asia-Pacific and the Western Balkans

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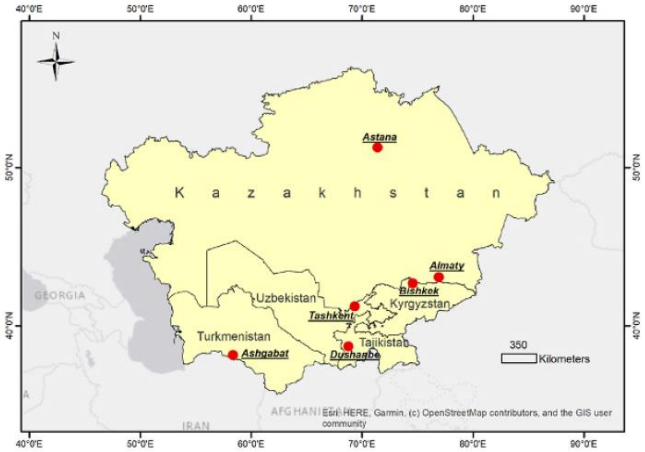
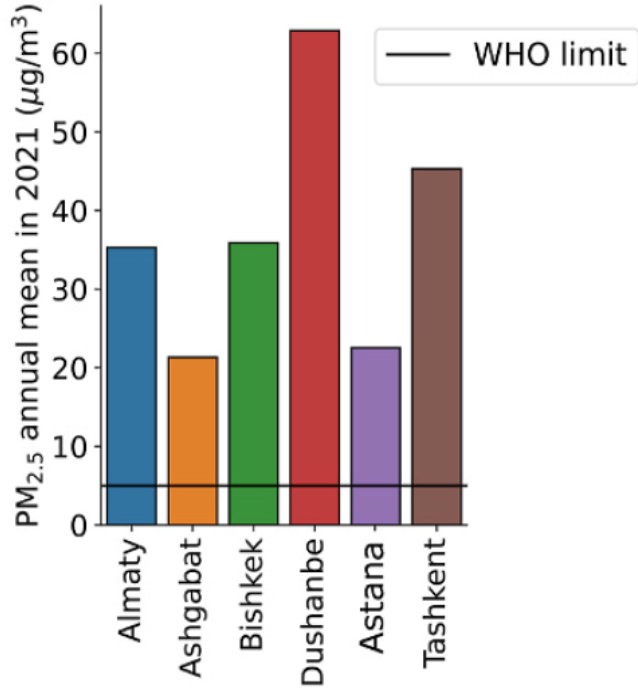
Air pollution in Central Asia

Major sources: **coal combustion for heating (industrial & domestic)**, transport, dust

Cities in Central Asia have become PM2.5 pollution hotspots due to rapid industrialization and urbanization coupled with poor environmental regulations. Coal combustion is the primary source of PM2.5 in major Central Asian cities.

- PM2.5 levels in major Central Asia cities (Astana, Almaty, Tashkent, Bishkek, Dushanbe, Ashgabat) exceeded the WHO annual limit by 4.3–12.6 times
- Common issues in the energy sector leading to higher air pollution:
  - major cities heated by central heating networks supplied by major combined heat and power plants built in Soviet times, using poor quality coal with no or little emissions control
  - settlements with private houses do not have access to a gas network or cannot afford it
  - many buildings are old and not energy-efficient and cold winters require a lot of energy for heating





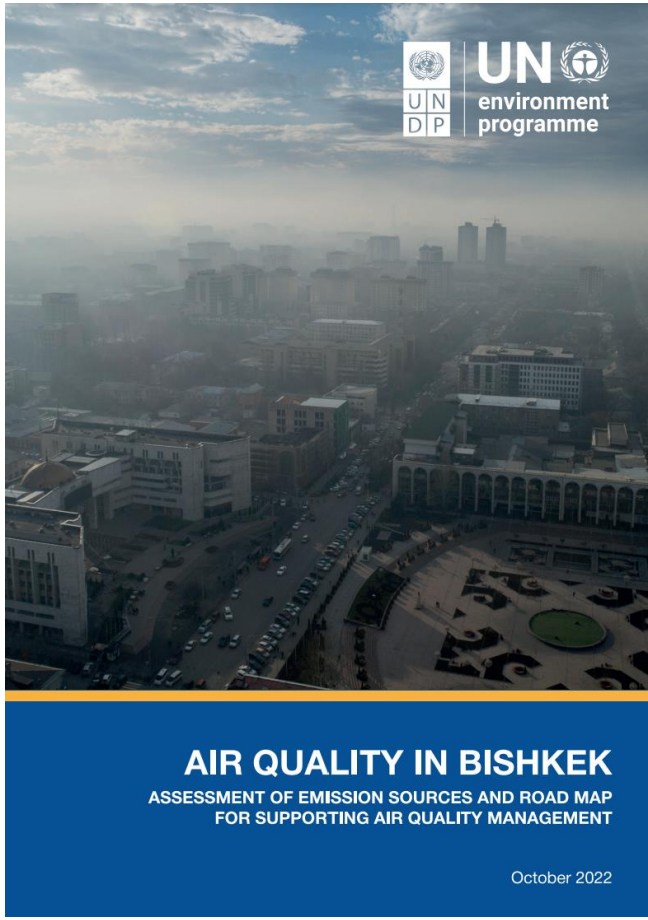
Source: [Tursumbayeva et al., 2023: Cities of Central Asia: New hotspots of air pollution around the world]

Assessment of air quality in Bishkek (UNEP & UNDP with FMI 2022)

The first assessment revealing household heating as the major source of air pollution

The most dangerous air pollution in the capital of Kyrgyzstan is caused by residential heating in wintertime.

- Bishkek experiences poor air quality throughout the year, with extremely dangerous levels during the wintertime heating period, topping the global AQI rankings in the recent couple of years
- The most dangerous levels of fine particulate matter (PM2.5) pollution are caused by residential heating with (sulphur-rich) coal during the wintertime exacerbated by poor mixing conditions of the air. It's an issue of many small emission sources rather than several big sources such as the CHP. Attention should be paid first and foremost to reducing emissions from private housing.
- Sulphur dioxide and benzo(a)pyrene concentrations measured in the Bishkek urban background air quality station are very high, linked to high sulphur content of fuel used in domestic heating
- Policies that incentivise households to **use heating sources other than coal**, such as heat pumps or electric heating provided by substantially increasing the capacity of renewable energy generation, will greatly benefit air quality in Bishkek. Measures that **enhance the energy efficiency** of new and old houses and buildings and reduce energy needs would also significantly improve air quality.



Source: Air Quality in Bishkek: Assessment of Emission Sources and Road map for Supporting Air Quality Management, UNEP and UNDP, 2022

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Policy Brief: Tackling Air Pollution in Bishkek: A Road Map to Cleaner Air

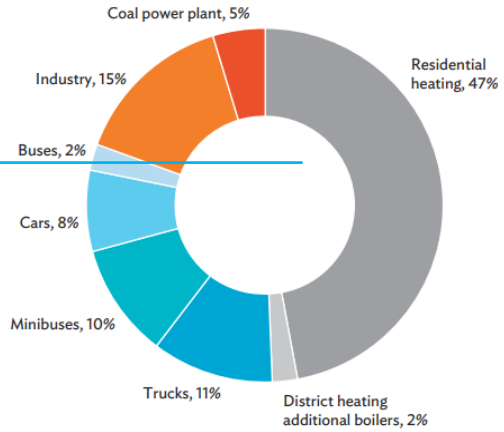
Supporting coherent multi-stakeholder clean air action in Bishkek and Kyrgyzstan

Joint call to action for partners in Kyrgyzstan offering a menu of clean air policy options through multiple sectors, prioritizing clean heating solutions

- Presented to the government by the development partners' working group on air quality co-chaired by UNEP and ADB as a proposal for a holistic approach to urban air quality challenge in Bishkek
- Reinforces the importance of residential heating as the major source of air pollution, as confirmed by 3 major studies by UNEP & UNDP, UNICEF and World Bank
- Highlights on policy options on clean heating:
  - Measures should primarily address space heating, given the large contribution of this sector to air pollution
  - The district heating network should be expanded in densely-populated areas
  - Heat pumps should replace coal-based heating in private houses
  - Improving building energy efficiency to lower the need for heating
  - Eliminating coal heating will require large investments
  - Long-term savings should be channeled to upfront investment in clean heating
  - Cleaner air and lower CO_2 emissions justify subsidizing by the government and international donors

Figure 2: Estimated Emissions of $PM_{2.5}$ in Bishkek by Source, 2023

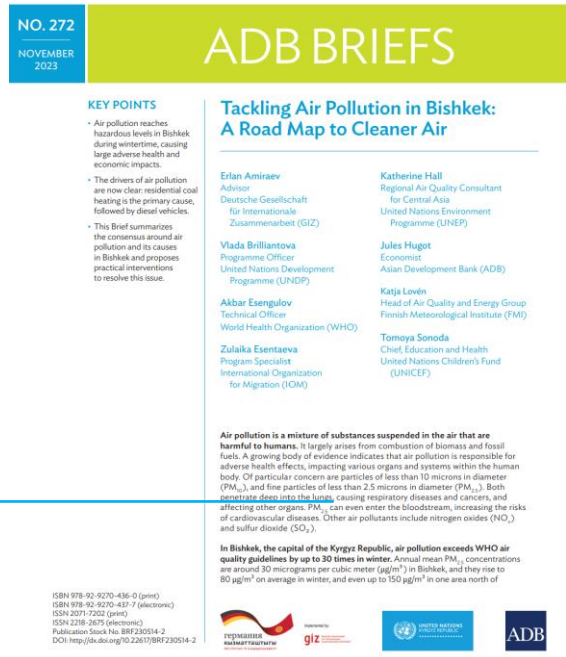
Residential heating is the main driver of fine particle pollution in Bishkek, followed by transport.



$PM_{2.5}$ = particulate matter of less than 2.5 microns in diameter.

Note: Emissions from solid waste burning are excluded from this inventory as they mostly arise outside the city limits.

Source: Authors' computations based on forecasts for 2023 from: UNDP and UNEP. 2022. *Air Quality in Bishkek: Assessment of Emission Sources and Road Map for Supporting Air Quality Management*. Bishkek and Nairobi.


NO. 272
NOVEMBER 2023

ADB BRIEFS

KEY POINTS

- Air pollution reaches hazardous levels in Bishkek during wintertime, causing large adverse health and economic impacts.
- The drivers of air pollution are now clear: residential coal heating is the primary cause, followed by diesel vehicles.
- This Brief summarizes the consensus around air pollution and its causes in Bishkek and proposes practical interventions to resolve this issue.

Tackling Air Pollution in Bishkek: A Road Map to Cleaner Air

Erlan Amiraev
Advisor
Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ)

Katherine Hall
Regional Air Quality Consultant for Central Asia
United Nations Environment Programme (UNEP)

Vlada Brilliantova
Programme Officer
United Nations Development Programme (UNDP)

Jules Hugot
Economist
Asian Development Bank (ADB)

Akbar Esengulov
Technical Officer
World Health Organization (WHO)

Katja Lovén
Head of Air Quality and Energy Group
Finnish Meteorological Institute (FMI)

Zulaika Esentaeva
Program Specialist
International Organization for Migration (IOM)

Tomoya Sonoda
Chief, Education and Health
United Nations Children's Fund (UNICEF)

Air pollution is a mixture of substances suspended in the air that are harmful to humans. It largely arises from combustion of biomass and fossil fuels. A growing body of evidence indicates that air pollution is responsible for adverse health effects, impacting various organs and systems within the human body. Of particular concern are particles of less than 10 microns in diameter (PM_{10}), and fine particles of less than 2.5 microns in diameter ($PM_{2.5}$). Both penetrate deep into the lungs, causing respiratory diseases and cancers, and affecting other organs. $PM_{2.5}$ can even enter the bloodstream, increasing the risks of cardiovascular diseases. Other air pollutants include nitrogen oxides (NO_x) and sulfur dioxide (SO_2).

In Bishkek, the capital of the Kyrgyz Republic, air pollution exceeds WHO air quality guidelines by up to 30 times in winter. Annual mean $PM_{2.5}$ concentrations are around 30 micrograms per cubic meter (μg/m³) in Bishkek, and they rise to 80 μg/m³ on average in winter, and even up to 150 μg/m³ in one area north of

ISBN 978-92-9270-436-0 (print)
ISBN 978-92-9270-437-7 (electronic)
ISSN 2071-7202 (print)
ISSN 2218-2675 (electronic)
Publication Stock No. BRF230514-2
DOI: http://dx.doi.org/10.22617/BRF230514-2

Source: Amiraev et al, 2023. Tackling Air Pollution in Bishkek: A Road Map to Cleaner Air

Promoting clean air and catalyzing stakeholder action

Supporting multi-stakeholder awareness raising and knowledge exchange

- Supporting the [Air Quality Central Asia (AQCA) Platform](): an NGO-led community on knowledge on air quality issues in the region:
  - Building capacities of NGOs leading the air quality agenda
  - Strengthening major air quality events such as the annual Central Asia Air Quality Conference

- Promoting clean air action through the celebration of the [International Day of Clean Air for Blue Skies](): events in Almaty, Tashkent, Bishkek

- **Strengthening communication capacities of key actors**:
  - Communication training for Ministry of Natural Resources, Ecology and Technical Supervision (Kyrgyzstan) and mayor offices of biggest cities
  - Development of PR campaigns to raise awareness on air pollution challenge, impacts and clean energy solutions
  - UN social media campaigns on air quality assessment results

AIR QUALITY CENTRAL ASIA

International Day of Clean Air for blue skies

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Thank you

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UNEP Europe Office
Tomas Marques, Europe Office, Geneva: tomas.marques@un.org
Ekaterina Perfilyeva, Sub-Regional Office in Almaty, Kazakhstan: ekaterina.perfilyeva2@un.org
Aleksandra Siljic Tomic, Project Office in Belgrade, Serbia: aleksandra.siljictomic@un.org