CEE Bankwatch Network

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Results of air pollution independent monitoring call for immediate action in Balkan countries

The echoes of the first ever World Health Organisation (WHO) Global Conference on Air Pollution and Health[1] that took place on 30 October – 1 November 2018 are slowly fading away, but so far they have not triggered a significant response from the Balkan countries' governments indicating a commitment to tackling air pollution .

And yet, according to the latest report on air quality in Europe[2] published by the European Environmental Agency just days after the WHO Conference, air pollution needs to be treated as one of the top environmental issues in the Balkan countries.

The report shows that steady but continuous improvement of air quality is underway in most European countries, but underlines that the Balkan countries are moving in the opposite direction. In most of these countries, including Romania and Bulgaria, a significant increase in both PM10 and PM2.5 annual mean values compared to the previous report can be noted.

The fact that air pollution monitoring in the Western Balkan countries - even in the locations that have monitoring stations - is incomplete and often interrupted by malfunctioning equipment, especially in winter months, adds to the problem. This also raises the issue of data accuracy and raises the question whether the annual mean values are even higher in reality.

Kosovo stands out as the country that is home to the most outdated coal power plant in the region, but doesn't have any air quality monitoring system in place. The only publicly available data on air quality comes from the monitoring station at the American Embassy in Pristina.

Independent particulate matter monitoring implemented by CEE Bankwatch Network and partner organisations from the region between October 2016 and April 2017 in six different coal-heavy locations in the Balkans just scratched the surface of the impact that coal power plants and open-cast lignite mines have on air quality. The indicative findings presented in our first briefing[3] showed that emissions of PM10 and PM2.5 are

CEE Bankwatch Network's mission is to prevent environmentally and socially harmful impacts of international development finance, and to promote alternative solutions and public participation.

Learn more: bankwatch.org

1 http://www.who.int/airpollution/events/conference/en/
2 https://www.eea.europa.eu/publications/air-quality-in-europe-2018
3 http://bankwatch.org/sites/default/files/briefing-Balkans-airpollution-26June2017.pdf

nowhere near being within the EU recommended limits at any of the locations monitored.

Since April 2017 no significant changes in energy policies in the Western Balkans have taken place. Plans for new coal capacities, mine expansions and even coal imports are still on the table. As far as existing coal power plants are concerned, the Energy Community contracting parties (including the Western Balkans countries) are still falling behind on implementing the Large Combustion Plants Directive (LCPD), are implementing very few concrete investment projects to reduce emissions and in some cases, eg. Serbia, also delaying the adoption of National Emissions Reduction Plans.

Even in official government plans to reduce air pollution and improve air quality, coal plants are mostly not even mentioned, as is the case with the latest example from Macedonia.[4]

In an effort to underline the importance of continuous monitoring of all pollutants from coal power complexes as an inseparable part of the process to bring them into line with the LCPD, since June 2017 the Environmental Dust Monitor (EDM 164) has continued its journey through communities affected by coal. There was a return visit to two locations, but also three new locations were included. Only one of those was in the EU - in Romania, with the others in the Western Balkans.

SUMMARY OF RESULTS PER LOCATION

Bitola, Macedonia

Monitoring period: 05.06.2017 – 04.07.2017

In Bitola, the vicinity of the thermal power plant and the ash deposit play a significant role in the PM10 and PM2.5 pollution, however the source of pollution is officially still unclear. For three successive years, the Ministry for Environment in Macedonia has been claiming that a chemical analysis as well as a study about the sources of pollution is underway, but no results have been published so far.

Environmental NGOs have notified the Ministry for the last 4 years about the risks to human health and about measures needed to prevent air pollution, but without success. Additionally, the financial implications of the air pollution originating from thermal power plants in Macedonia in the form of lost productivity and public health expenses have been estimated to be over EUR 20 million/year, and most of that comes from the plant near Bitola.[5]

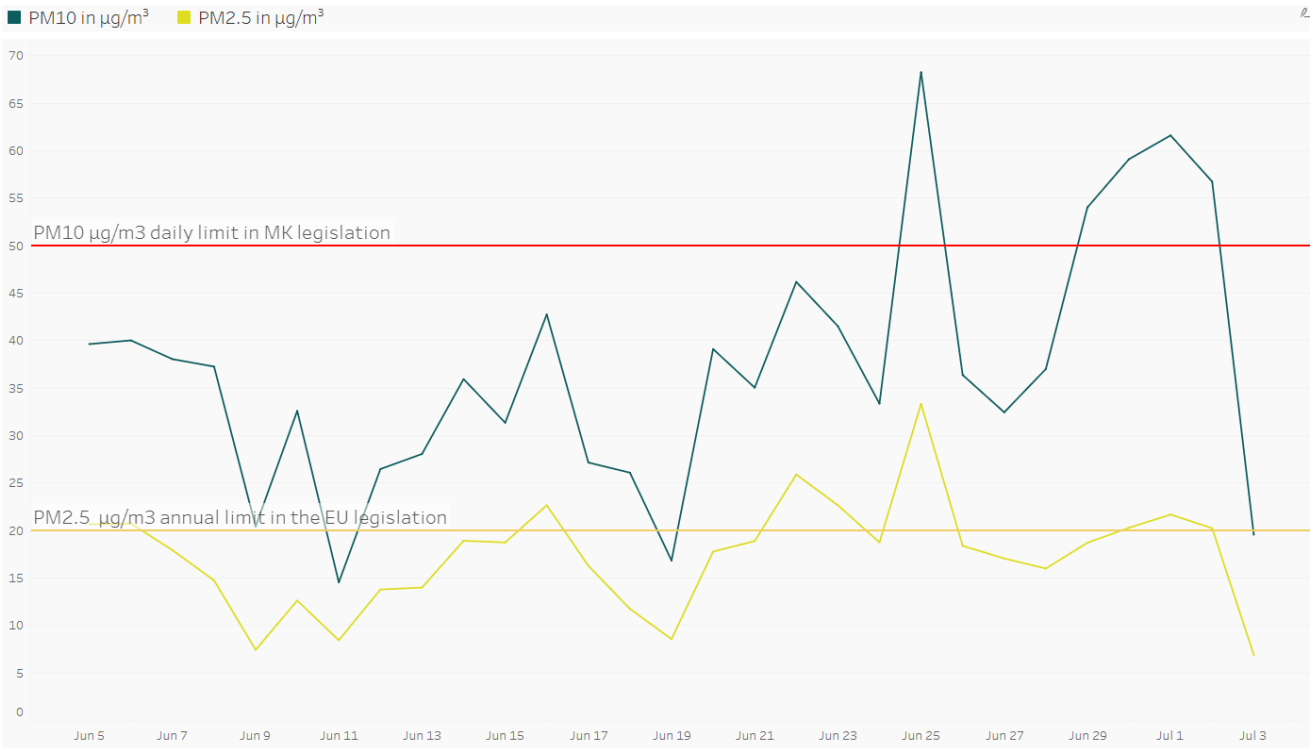
After massive protests attended by thousands of Bitola's residents in 2014 and 2015, the Ministry drew up several urgent measures to decrease pollution levels, but the Government refused to undertake any of them. According to the air quality report by the European Environmental Agency, Macedonia has the highest annual mean value of PM2.5 in Europe - almost three times above the WHO recommendations.

The PM2.5 limit was above the EU's limit value for the annual average on 7 out of 29 days observed, ie. for 25% of the time. While the Macedonian law on air quality does not have a limit for PM2.5, EU legislation does not allow any exceedance of the annual limit for PM2.5.

The EU PM10 limit for the daily average was breached on 5 days out of 29 observed. Over the course of one year, the PM10 limit may be exceeded no more than 35 times. If in June – a month when the government's preferred culprits, individual wood stoves, were not contributing to this pollution – Bitola recorded 5 exceedances, limiting them to 35 for the whole year seems like a distant wish. The observation period was also

4 https://vlada.mk/sites/default/files/dokumenti/PlanZaChistVozduh/programa_namaluvanje_aerozagaduvanje_mkd.pdf
5 https://bankwatch.org/wp-content/uploads/2018/11/kolku_cini_zivotot.pdf

one when schools are on holiday and already people are leaving town for their summer vacation, so traffic numbers are lower than usual. This only leaves the elephant in the room to blame – the Bitola coal power plant.



Bitola: 24 hours average emissions

Tuzla, Bosnia and Herzegovina

Monitoring period: 10.10.2017 – 18.10.2017

Tuzla is notorious for its poor air quality, with locals taking to the streets in recent winters to protest about the heavy levels of fine dust in the atmosphere.

The state-owned electricity company plans to build a new 450 MW lignite-fired unit at the Tuzla power plant. This would only replace two of the four remaining units, increasing the overall capacity.

The main causes of the problem with polluted air are perceived to be the thermal power plant (4 units), traffic and individual heating, but what the local authorities fail to determine is the contribution from each sector.

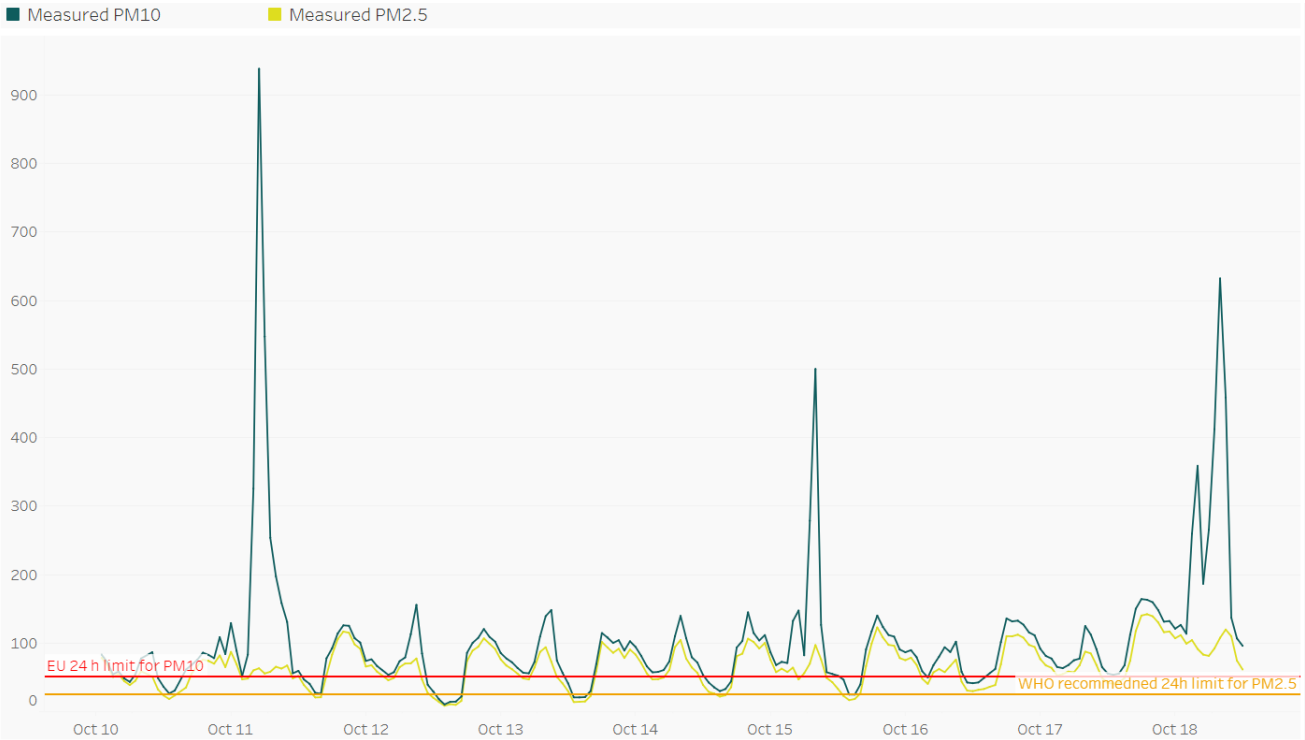
The concentration of PM2.5 is up to 300 micrograms/m^3 and more, along with high concentrations of SO_2, making air pollution in Tuzla even worse than in other cities in Bosnia and Herzegovina.

The lack of interest from the responsible cantonal ministry and inadequate plans for emergency measures, and additionally incomplete Federal legislation (there are no defined maximum concentrations of PM2.5), resulted in no warning or measures related to this pollutant despite the fact that concentrations reached twelve times more than the WHO guidelines of 25 micrograms/m^3 for 24-hour averages in previous years. The monetised

impact on public health of the planned 450MW unit was estimated by a recent HEAL study to be between EUR 4-12 million/year.[6]

The second visit of the Environmental Dust Monitor to Tuzla was shorter than the first, but no less intriguing. Over nine days of monitoring, record breaking values of PM10 were recorded, with the highest peak at 937 micrograms/m³ on 11 October at 5AM - almost 20 times above the limit. Other notable recorded values of PM10 were recorded on 18 October, 8AM – 632 micrograms/m³, followed by 500 micrograms/m³ on 15 October at 8AM.

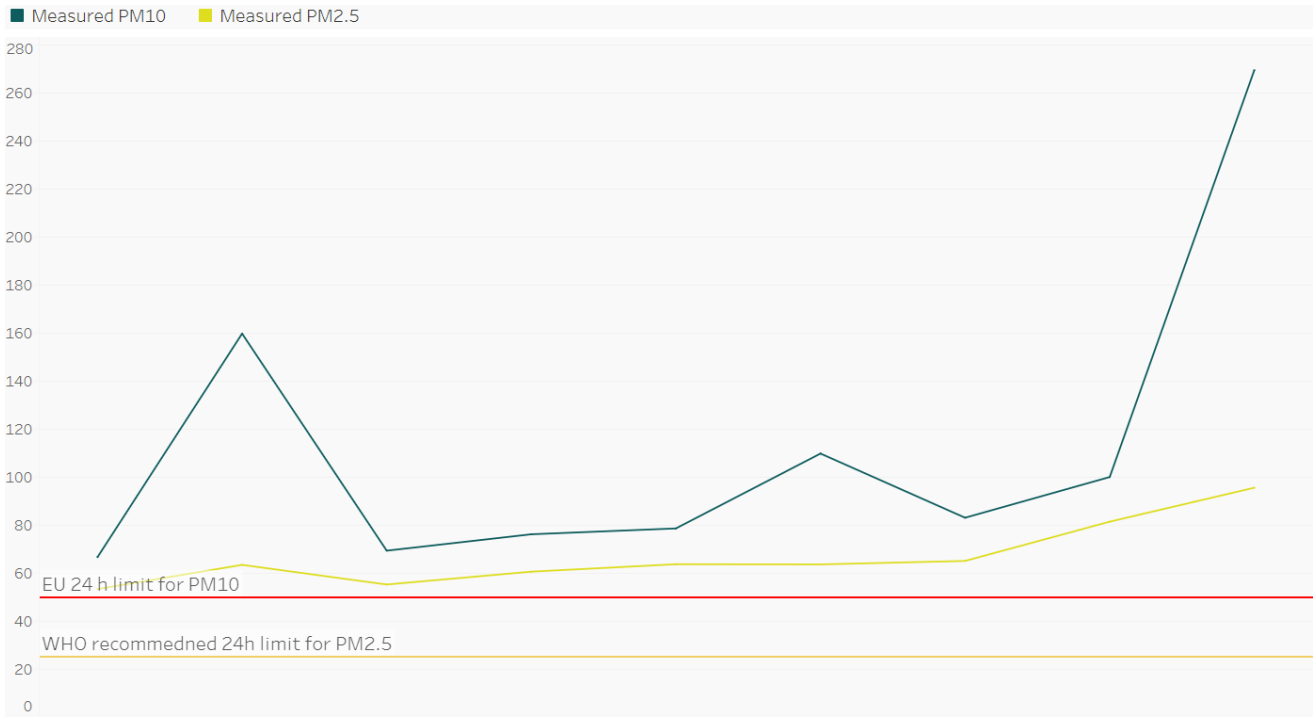
The graph of hourly measurements shows numerous PM10 and PM2.5 spikes, namely 167 out of the total of 203 hours measured for PM10, and 181 exceedances for PM2.5. Interestingly, while PM10 values seem at their highest in the early morning, PM2.5 peaks were recorded predominantly in the evenings. The top 4 hourly values of PM2.5 were on 17 October, between 6 and 9PM, ranging between 129 and 141 micrograms/m³.



Tuzla: hourly values of PM 10 and PM 2.5

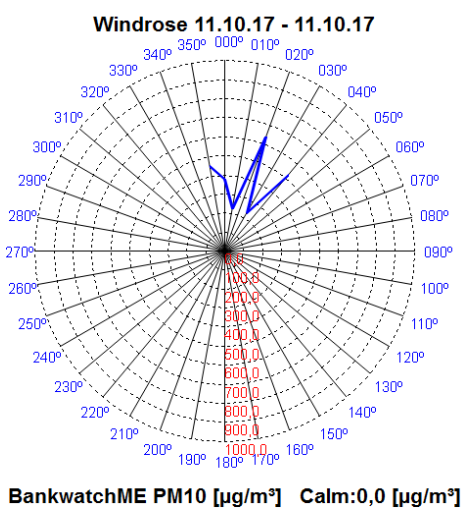
The second graph shows the average PM10 and PM2.5 levels over a 24-hour period. The EU limit for PM10 and the WHO recommended limit for PM2.5 were both blatantly exceeded on all days of measurements. Over the course of one year, the PM10 limit may be exceeded no more than 35 times, according to the EU Air Quality Directive.

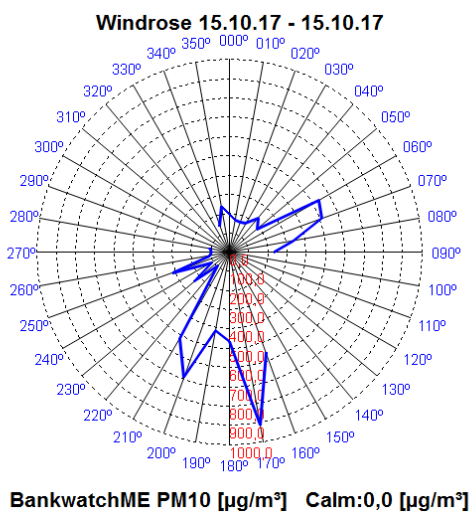
6 http://env-health.org/IMG/pdf/factsheet_bosnia_en_web.pdf



Tuzla: 24 hours average emissions

An analysis of the wind direction provides evidence that the spike in emissions on 11 October was caused by wind blowing from the direction of the ash disposal site, i.e.from the north, while the second peak, on 15 October 15, is attributable to the Tuzla power plant, located south of our monitoring point.



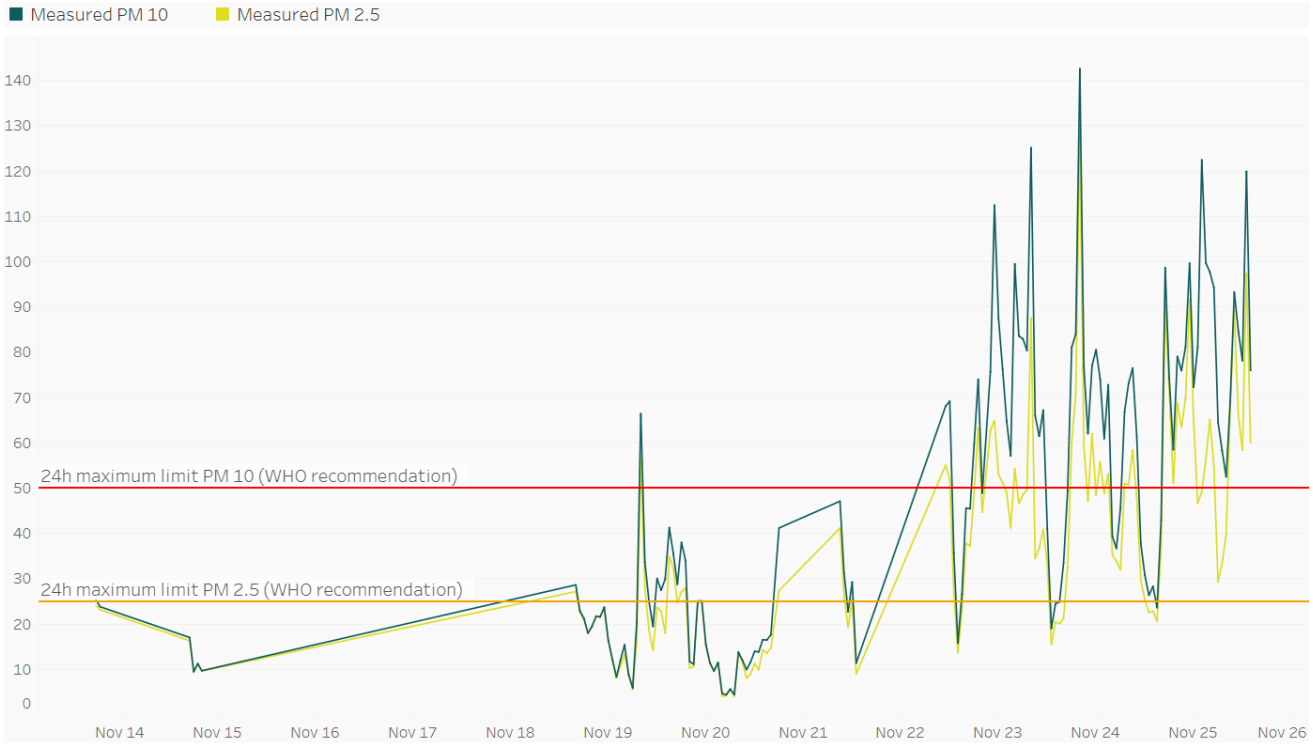


Gacko, Bosnia and Herzegovina

Monitoring period: 13.11.2017 – 25.11.2017

The town of Gacko is home to a 300 MW thermal power plant and an open-cast lignite mine with capacity of 1.8 million tonnes of coal. According to a Health and Environment Alliance report on coal pollution and its health impacts[7], this old plant emits 748 t/year of PM2.5 - almost 12 times above the dust emissions allowed under the Industrial Emissions Directive, which the country needs to implement at the latest in January 2028. State-owned utility Elektroprivreda Republike Srpske, together with China Machinery and Engineering Corporation (CMEC) and Emerging Markets Power Fund, plans to build a new 350 MW lignite power plant in Gacko, near the town's existing plant, and in December 2017 a Memorandum of Understanding was signed to move the project forward.

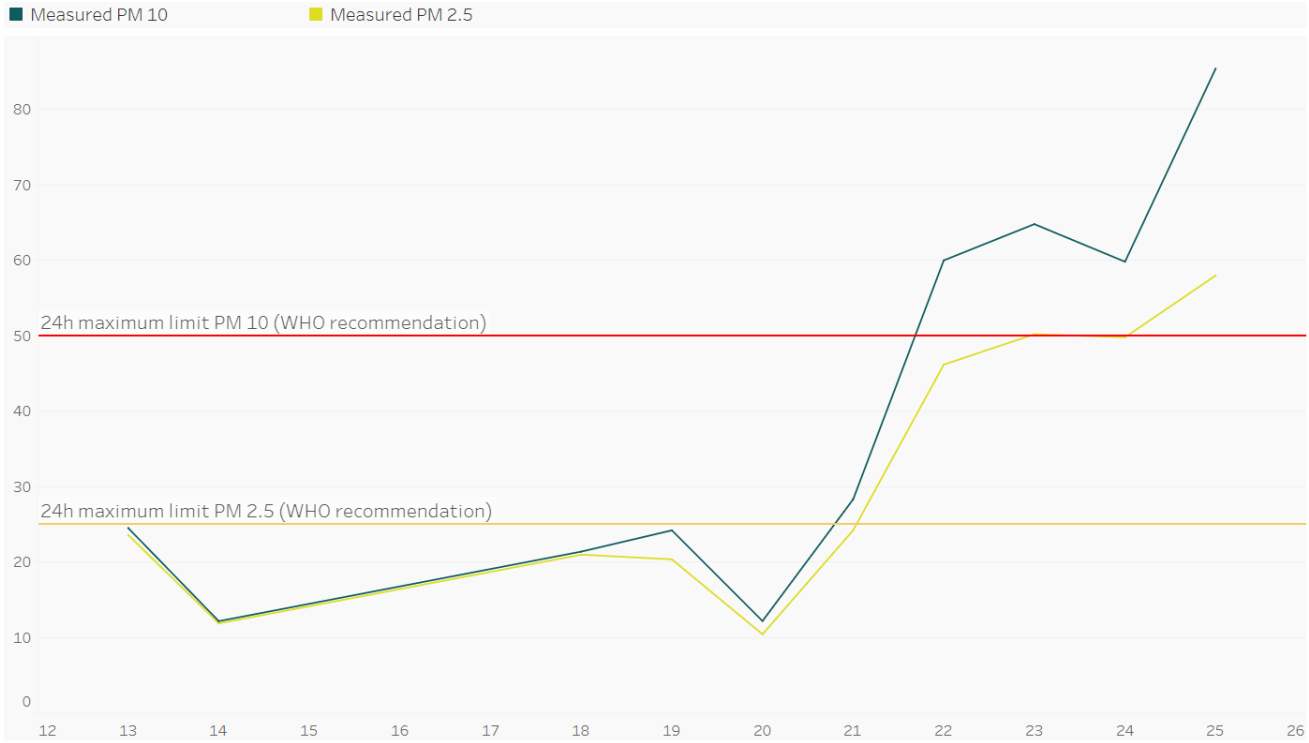
A graph of hourly measurements shows some high PM10 and PM2.5 peaks, with the highest recorded on 22 November at 23:00 (112.4 micrograms/m^3 for PM10, and 64.8 micrograms/m^3 for PM2.5), the following morning at 08:00 (125 micrograms/m^3 for PM10, and 87.5 micrograms/m^3 for PM2.5) and the absolute highest, on 23 November at 20:00 (142.5 micrograms/m^3 for PM10 and 127.8 micrograms/m^3 for PM.25). A wind direction analysis for these peaks showed that the first pollution spike, on 22 November, originated at the local coal-fired power plant, the second at the coal mine, and both the power plant and mine were the source of the peak on the evening of 23 November.



Gacko: hourly values of PM 10 and PM 2.5

7 http://env-health.org/IMG/pdf/13.12.2017_-_boosting_health_by_improving_air_quality_in_the_balkans_ied_briefing.pdf

The graph with daily averages of PM10 and PM2.5 levels shows that the WHO recommended 24-hour limit for both PM10 and PM2.5 was exceeded on 4 of the 10 days of observation. The air quality legislation in Republika Srpska has no 24-hour limit for PM2.5 and the annual average is set at 15 times the WHO's recommendation.



Gacko: 24 hours average emissions

Drmno, Serbia

Monitoring period: 14.04.2018 – 14.05.2018

The village of Drmno is trapped between the Kostolac B power plant and the Drmno open-cast lignite mine which supplies its fuel. A new 350 MW lignite plant is planned at the Kostolac complex, with two of the 4 existing units to continue running alongside the new one.

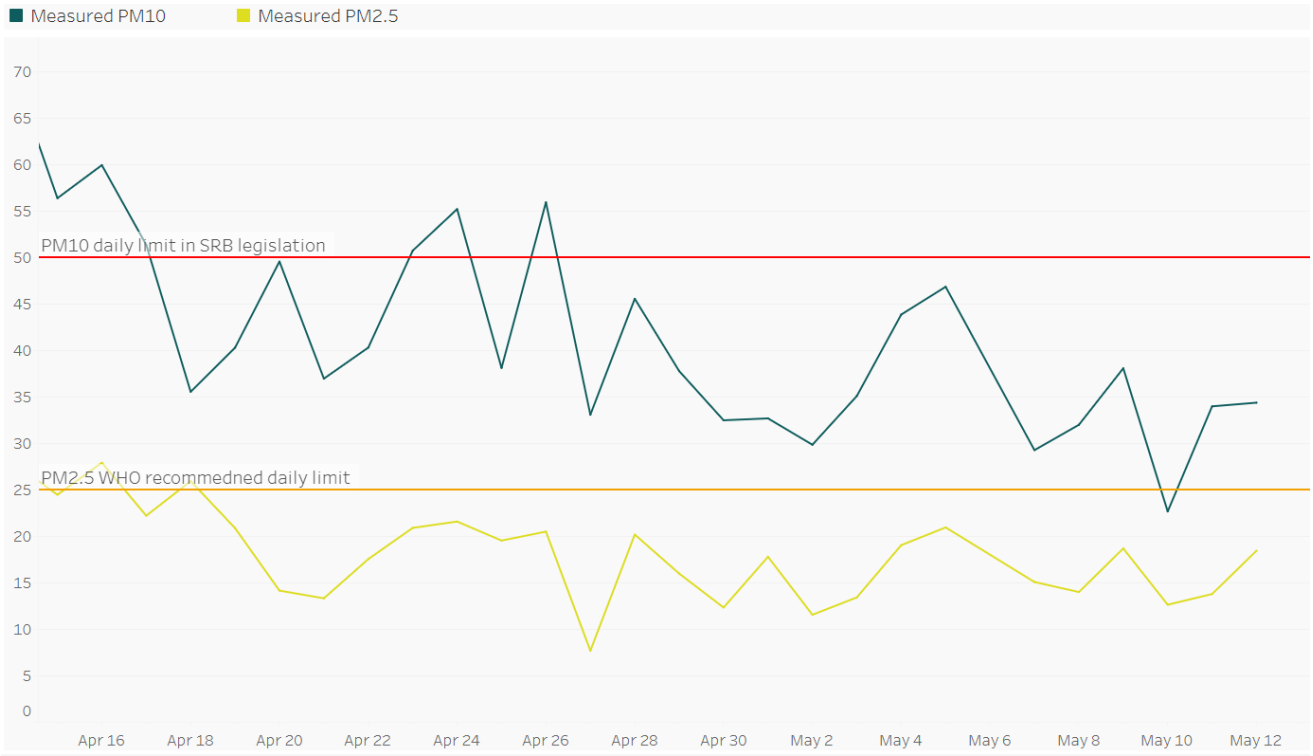
The current ash dump is a constant source of PM pollution, particularly in the dry and windy season, with the north wind blowing in the direction of the inhabited areas around. A new planned dump would be located at the edge of the open-cast mine in the opposite direction, thus increasing dust pollution from that direction and practically surrounding the village with constant pollution.

The existing units are not in compliance with the Large Combustion Plants Directive emissions levels. Moreover the oldest two units (A1 and A2) are expected to keep operating with reduced operating hours until 2023 without any pollution control improvements.

According to the latest EEA report on air quality,[8] more than 13,000 premature deaths in Serbia are due to high PM2.5 concentrations. In relative terms, when considering Years of Life Lost per 100,000 inhabitants, Serbia has the highest ratio.

During the monitoring period in Drmno, the WHO-recommended 24-hour limit for PM2.5 was exceeded on 3 of the 28 days. The Serbian 24-hour limit for PM10 (50 micrograms/m3) was exceeded on 7 days, or 25% of the time. It is noteworthy that the measurements were carried out at a time when household heating was no longer needed and nor was the temperature inversion phenomenon present.

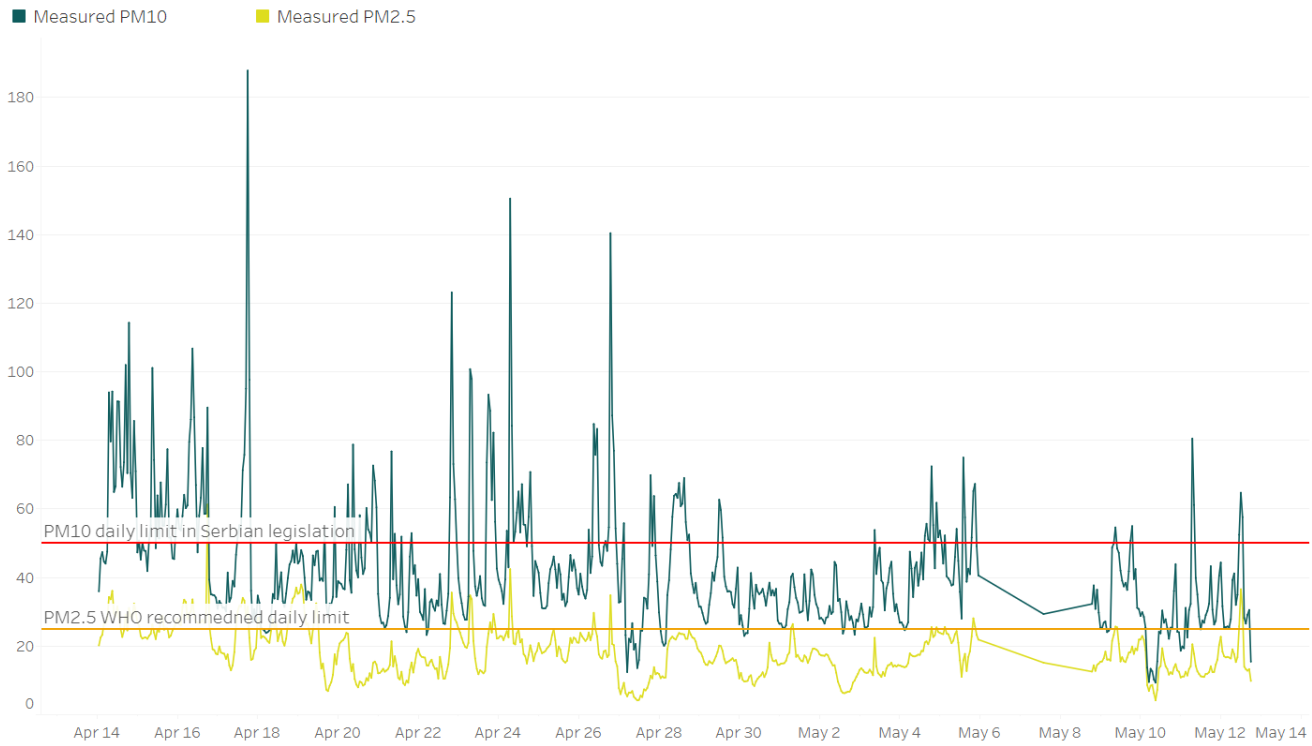
According to the EU Air Quality Directive, over the course of one year, the PM10 limit may be exceeded no more than 35 times, while the PM2.5 limit cannot be exceeded at all.



Drmno: 24 hours average emissions

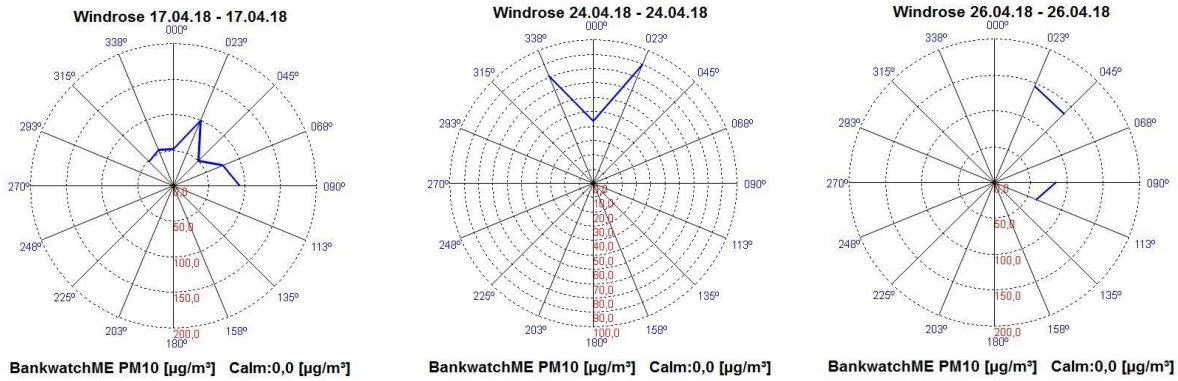
The graph of hourly measurements shows some high PM10 peaks, with the highest recorded on 17 April at 18:00 (187.73 micrograms/m3), followed by the morning of 24 April at 7:00 (150 micrograms/m3), and on 26 April at 19:00 (140.33 micrograms/m3).

8 https://www.eea.europa.eu/publications/air-quality-in-europe-2018



Drmno: hourly values of PM 10 and PM 2.5

The wind direction analysis for these peaks showed, based on the location of the air pollution equipment and the meteorological data provided by the monitoring equipment, that all PM10 spikes originated from the direction of the local coal-fired power plant, Kostolac B and the coal conveyor belt transporting coal from the mine to the power plant.



Our monitoring device, together with the meteorological sensor, was placed about 1 km south-west of the Kostolac B power plant and 2.5 km to the ash disposal site. To the north, there is a conveyor belt, and all the way between 30 and 180 degrees in the diagram is the Drmno open-cast lignite mine.

Therefore, when the wind blows from the north or north-east– as in the top half of the diagram – and the PM10 emissions are high, we can point to either dry ashes blowing from the ash dump in the direction of the village, or to the power plant or to the conveyor belt, all of them being in this direction. Similarly, when the wind is blowing from the east, the right hand-side of the diagram) the dust blown most likely originates from the open-cast lignite mine.

Roșiuța, Romania

Monitoring period: 26.05.2018 – 26.05.2018

The village is sandwiched between two open cast lignite mines, Roșiuța and Motru (also known as Lupoaia) and is exposed to tremendous levels of coarse particulate matter (PM10) pollution.

There is no official air pollution monitoring station in the village, and the host of our EDM164 monitor has for years submitted requests to the local Environmental Protection Agency to come and perform measurements. The method used by the Agency is empirical – a water bucket[9] which is left to collect dust samples for a month and then the quantity of particles is in theory weighed and it is calculated whether the air is in line with the air quality legislation.

The spiking green and yellow lines represent hourly mean values for PM2.5 and PM10. The straight horizontal lines represent EU level standards as per the Air Quality Directive, for the annual mean. The visible high levels of coarse particles, PM10, are indicative of its primary sources: the open-cast mines and open conveyor belts surrounding the village.

There are several hourly PM10 peaks, with the highest recorded on 6 June, at 6 AM local time, with 648 micrograms per cubic metre. The windrose analysis for that particular time of the day shows the wind was blowing from the south-east, which, in relation to our monitor's position, indicates that the Motru (or Lupoaia) mine is the source of pollution.

A second PM10 peak was recorded on 20 June, also at 7 AM local time, of 570 micrograms per cubic metre. In this case, the windrose analysis indicates that the source of the pollution was the Roșiuța lignite mine.

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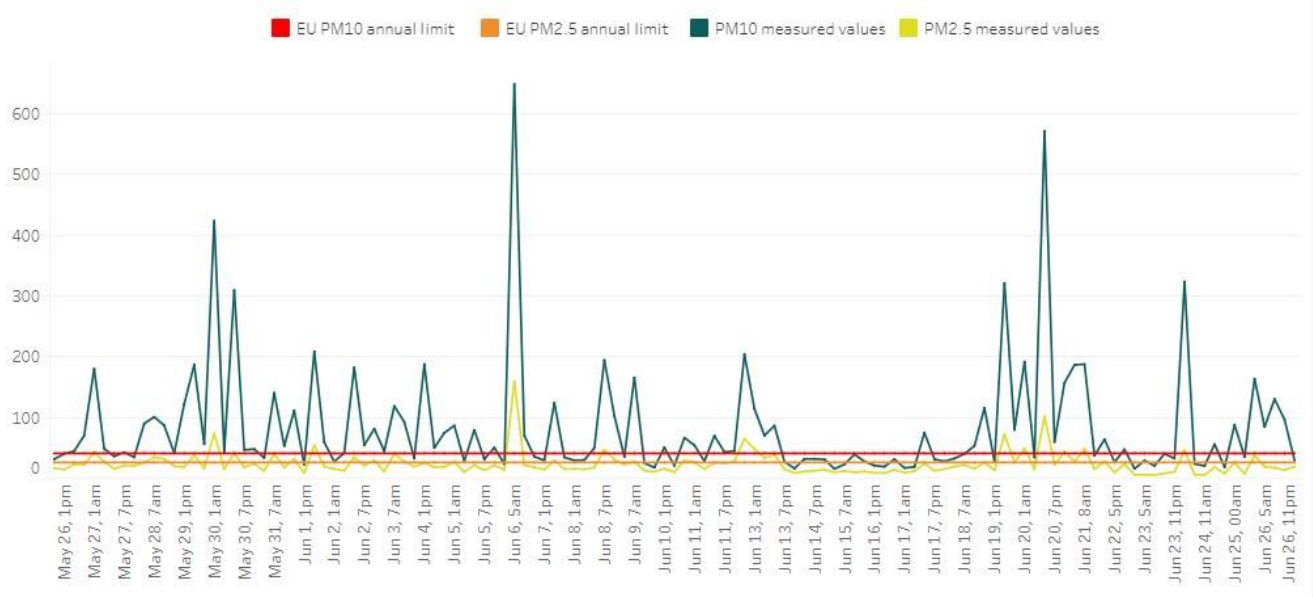
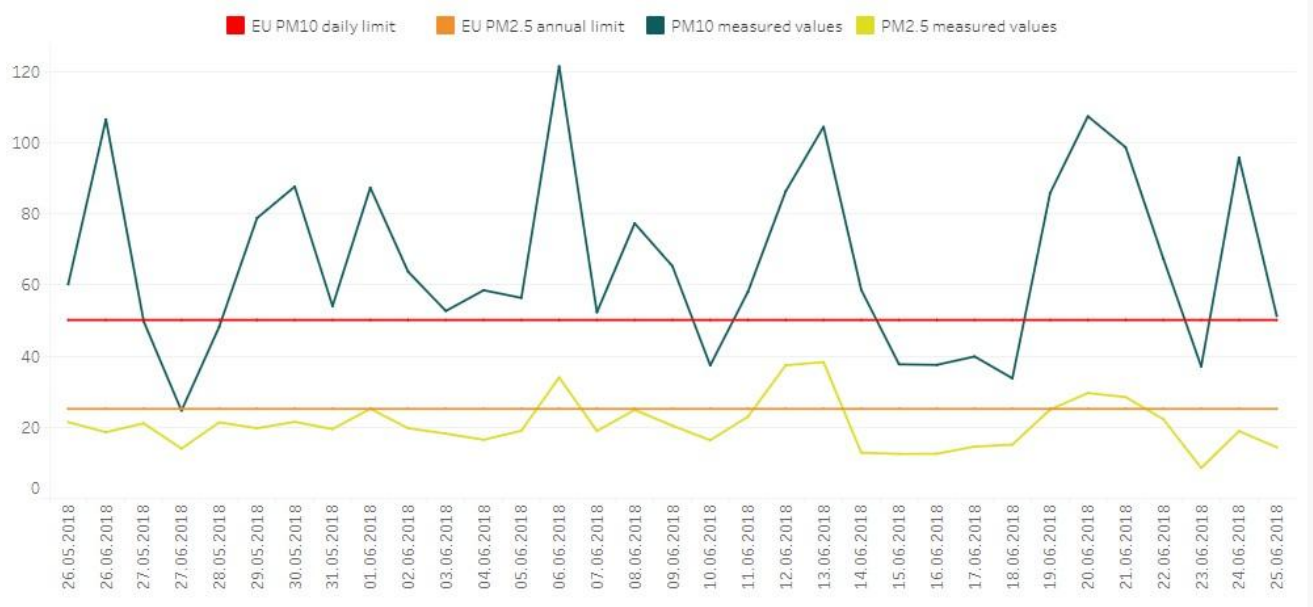
9 https://bankwatch.org/blog/bucket-challenge-in-romania-coal-industry-causes-air-pollution



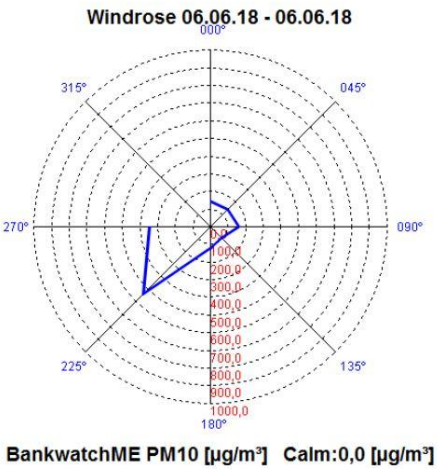
Roşiuţa: hourly values of PM 10 and PM 2.5

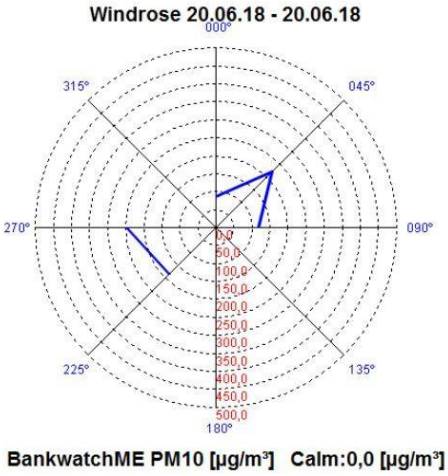
Over the 32 days of monitoring PM10 and PM2.5 emissions in Roşiuţa the EU limit on PM10 was exceeded on 23 days and on 4 of these days, the levels recorded were above double the limit for the daily average. Over a year, only 35 daily average exceedances are allowed.

The EU annual average limit on PM2.5 was exceeded on 6 of the 32 days of monitoring.



Roşiuţa: 24 hours average emissions





Conclusions and recommendations

As one of the most complex environmental issues composed of many sources including different industries, household heating, transportation, waste management etc., air pollution requires strong and immediate intersectoral action.

The findings from over two years of independent air quality monitoring undertaken by CEE Bankwatch Network in coal-dependent regions show that air pollution levels are above both the EU and WHO recommended limit values even in the summer months when sources such as individual household heating can be excluded.

This strongly suggests that these regions will need to put significant efforts into achieving the requirements in the Air Quality Directive as long as the thermal power plants are not in line with the Large Combustion Plants and Industrial Emissions Directives, and as long as air pollution from coal-related facilities, such as mines and ash disposal sites, is not regulated.

Balkan governments are reluctant to include measures directed toward these facilities in their plans to fight the extreme air pollution. This is why it is essential for these countries to introduce continuous monitoring of all pollutants emerging from the different coal capacities so that proper short and long term measures can be set in place to keep the air pollution within the EU 24-hour average limits.

Recommendations

The European Commission should table a proposal for the adoption of the Air Quality Directive or National Emissions Ceilings Directive, adapted for network energy, in the Energy Community as soon as practicably possible.

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The Energy Community is recommended to adopt and implement this legislation promptly after a proposal is presented by the Commission, in order to avoid further worsening of the air pollution and its deadly impacts on health.

The European Commission and Energy Community must ensure LCPD enforcement, currently delayed in most of the countries.

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The national authorities in the Energy Community countries are recommended to thoroughly monitor air pollution levels in locations prone to high emissions because of coal mining and combustion activity and to make this data available to the public.

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The national authorities are encouraged to design a long-term vision that would prioritise decarbonised energy generation sectors across the region, putting energy efficiency first, cleaner/alternative fuels and electrification for all modes of transportation, and strict enforcement of air quality standards.

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Environmental authorities in both the Western Balkan countries, as well as those in Romania, must ensure that existing official monitoring stations measure also PM and must make the measurements available in real-time.

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Environmental and local authorities are recommended to draw up/revise and implement local action plans on air pollution, addressing the local main sources of pollution, and set up emergency measures for periods when the allowed levels of emissions go beyond the EU limit for the 24 hour average ■