



Under the Convention on Long Range Transboundary Air Pollution

*Case Study on EECAs:
Technological Pathway toward the Amended Gothenburg
Protocol Ratification*

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- Approach used: reminder
- Summary of results obtained in Serbia, Moldova, Kazakhstan and Georgia
- Case study 5: Armenia
- **Case study 6: Montenegro**

- **Case study 6: Montenegro**
 - Ratification of Protocols

Montenegro: Status of ratification of CLRTAP and the protocols

Montenegro ratified CLRTAP and the Protocols of EMEP 23 October of 2006 and has joined Protocols on:

- Heavy Metals 30 December 2011
- Aarhus Protocol on Persistent Organic Pollutants 9 February 2012

In 2011 Montenegro established a Law on the approval of the protocol on GP 1999 ("**Official Gazette of Montenegro - International Agreements**", No. 08/11 dated 01.07.2011), however without establishing emission ceilings within it

Montenegro has not signed nor ratified Gothenburg protocol

- **Case study 6: Montenegro**
 - Ratification of Protocols and strategic documents
 - Air quality



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Montenegro: air quality monitoring



- Air quality in Montenegro has been monitored in accordance with European standards since 2009
- Over the past 10 years, the number of automatic air quality monitoring stations has been gradually increased
- There are 9 continuous monitoring stations and 1 additional EMEP station to measure background concentrations
- Assessment of air quality is carried out in accordance with on the Regulation on the Determination of Types of Pollutants, Limits values and other air quality standards (2012) and in accordance with Directives 2008 /50/EC and 2004/107/EC
- Data from the monitoring stations are available to the public and other stakeholders on the website of the Environment protection Agency of Montenegro – EPA Montenegro (<http://www.epa.org.me/vazduh/>)

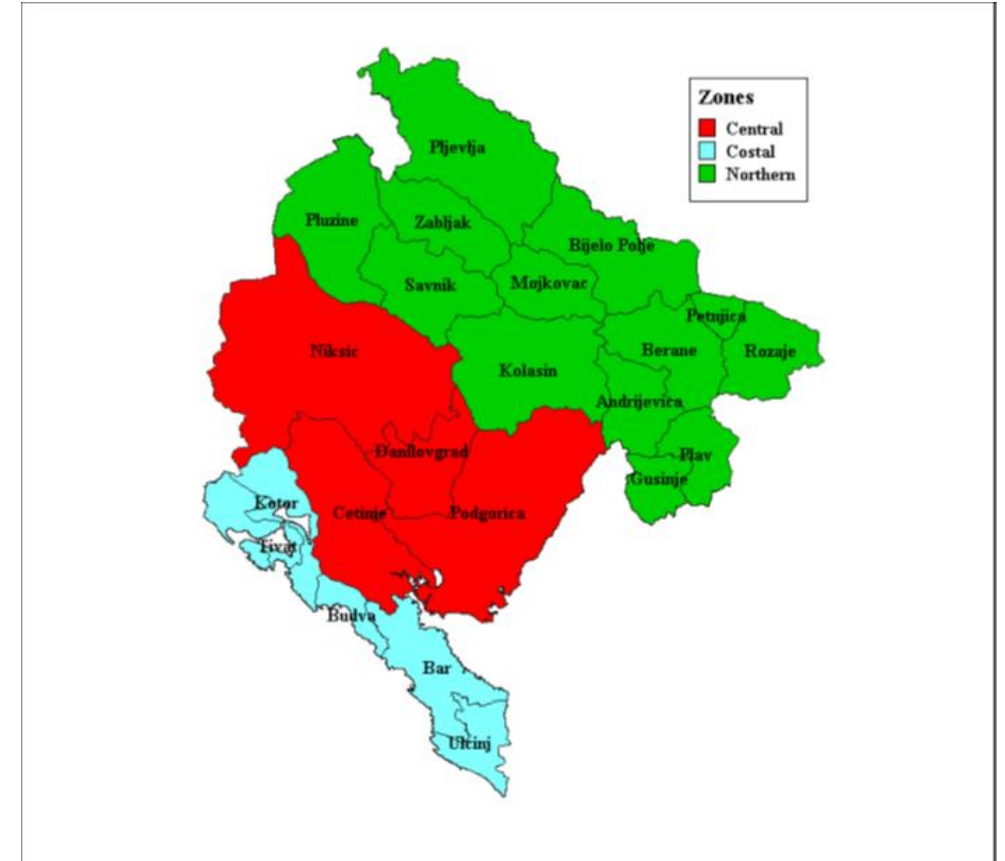
- Current air quality legislation in Montenegro to fulfill all obligations stemming from the EU accession program of Montenegro is aligned with the Directive 2008/50/EC

Law on Air Protection ("Official Gazette of Montenegro", number 25/10 dated 05.05.2010, 040/11 dated 08.08.2011, 043/15 dated 31.07.2015, 73/19 from 27.12.2019)

Regulations and rulebooks:

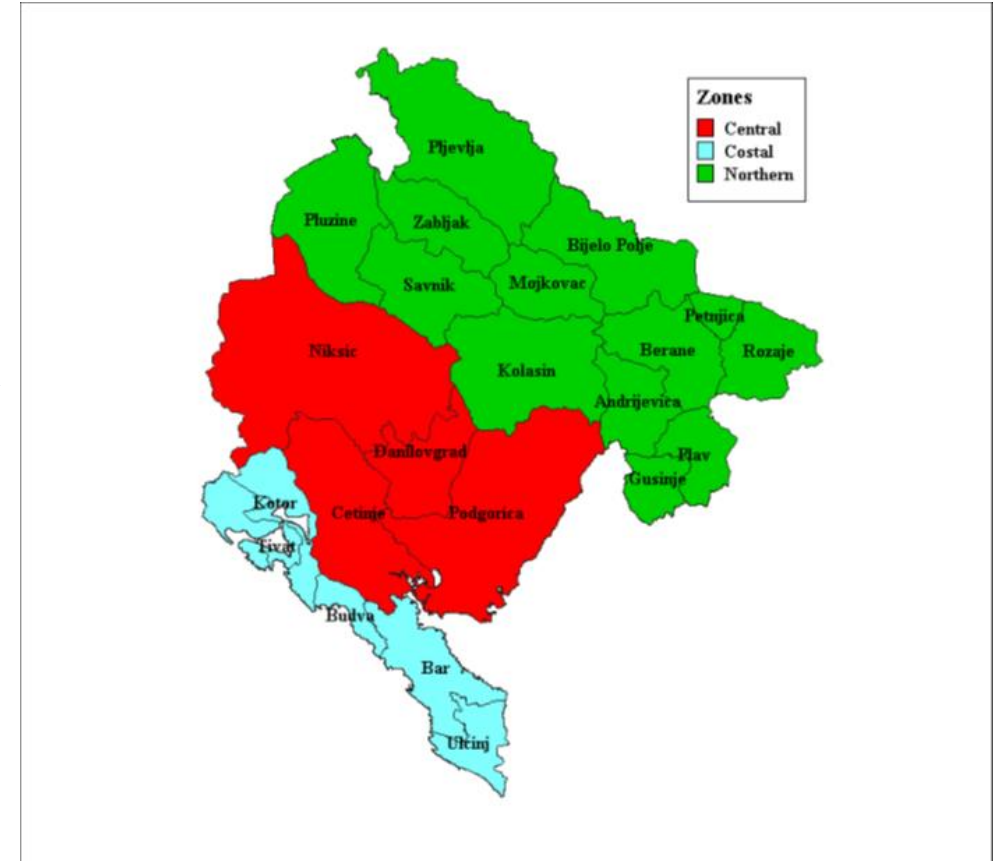
1. Regulation on activities that affect or may affect air quality ("Official Gazette of the Republic of Montenegro", no. 61/2012 of 7 December 2012)
2. Regulation on the establishment of a network of measuring points for air quality monitoring, ("Official Gazette of Montenegro", no. 44/10 of 30.07.2010, 13/11 of 04.03.2011, 064/18 of 04.10. 2018)
3. Regulation on the Determination of Types of Pollutants, Limits values and other air quality standards ("Official Gazette of the Republic of Montenegro", no. 25/12 from 11.5.2012)
4. Rulebook on the manner and conditions for monitoring the quality of air ("Official Gazette of Montenegro", No. 21/2011, 032/16 dated 20.05.2016)
5. Rulebook on the content and method of making annual air quality information ("Official Gazette of Montenegro", No. 27/2012)

- Montenegro is divided into three air quality zones
- Air quality monitoring is mandatory in all zones, but not in all municipalities
- Pollutants covered: SO₂, NO₂, ground O₃, CO, PM₁₀ and PM_{2.5}, Cd, As, Ni, Pb, PAH (b(a)p), and Hg
- Since 2019, EMEP continuous monitoring station in Velimlje was established with continuous measurements of SO₂, NO_x, PM₁₀, and PM_{2.5} among others



In 2021:

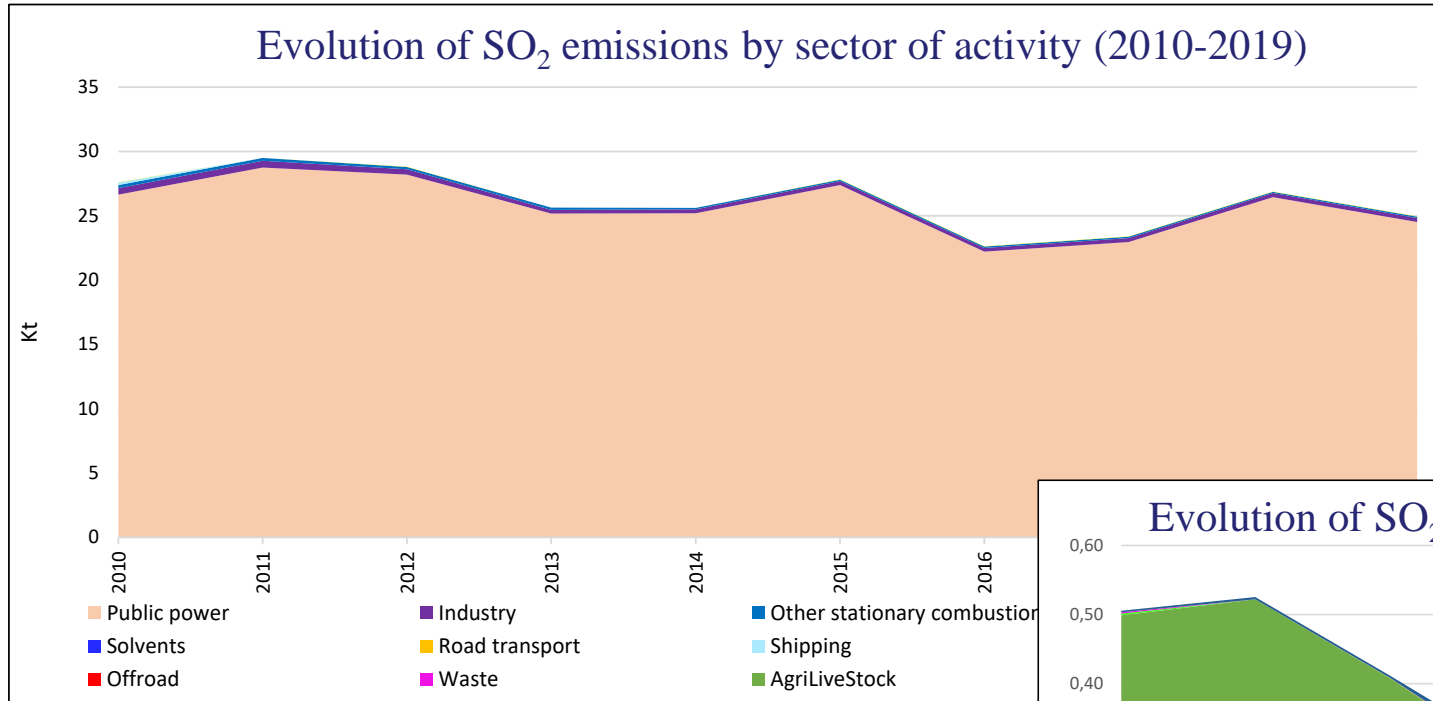
- all stations measuring PM₁₀ have one-hour threshold violations (50 µg/m³)
- measurements of PM_{2.5} at four stationary monitoring stations out of five exceeded the average annual concentration of PM_{2.5} limit value of 20 µg/m³
- only in two stations both of the Northern air quality zone there were SO₂ one-hour threshold violation (350 µg/m³), but no daily threshold violations (125 µg/m³)
- in all stations except Podgorica, concentrations of NO₂ were below one-hour and annual thresholds (200 and 40 µg/m³ respectively)



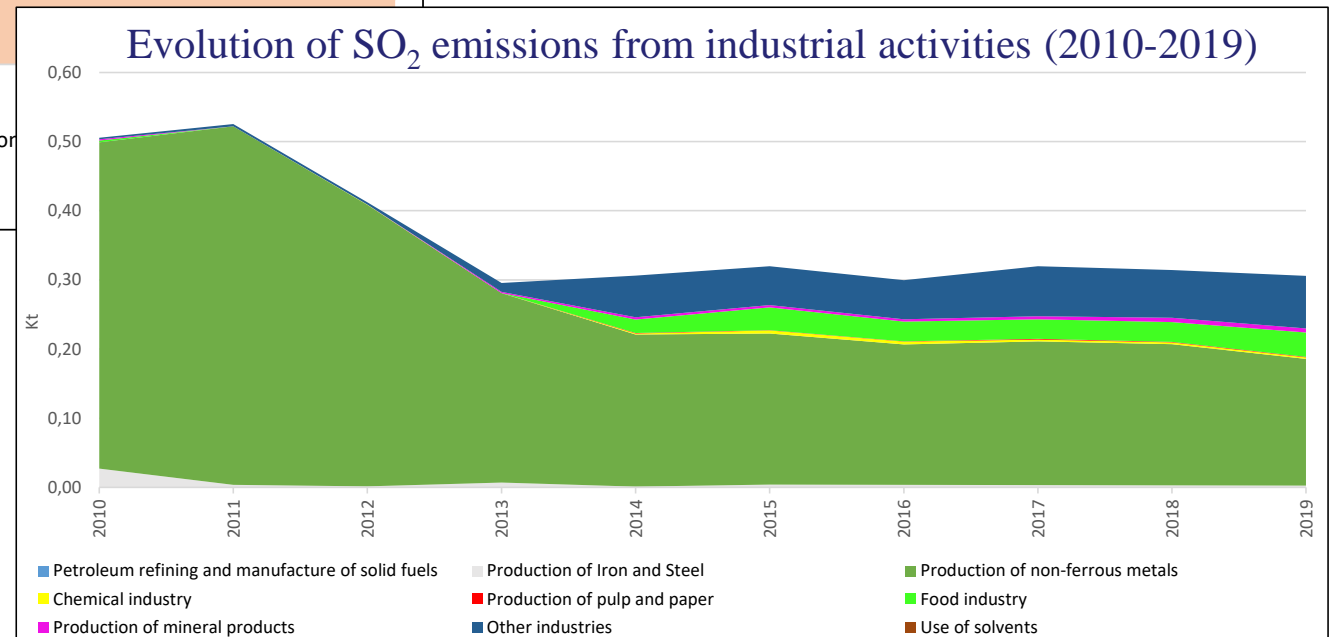
National Air Quality Management Strategy 2021-2029, Ministry of Ecology, Spatial Planning and Urbanism, March 2021

- **Case study 6: Montenegro**
 - Ratification of Protocols and strategic documents
 - Air quality
 - Sources of emissions

Montenegro: main sources of SO₂

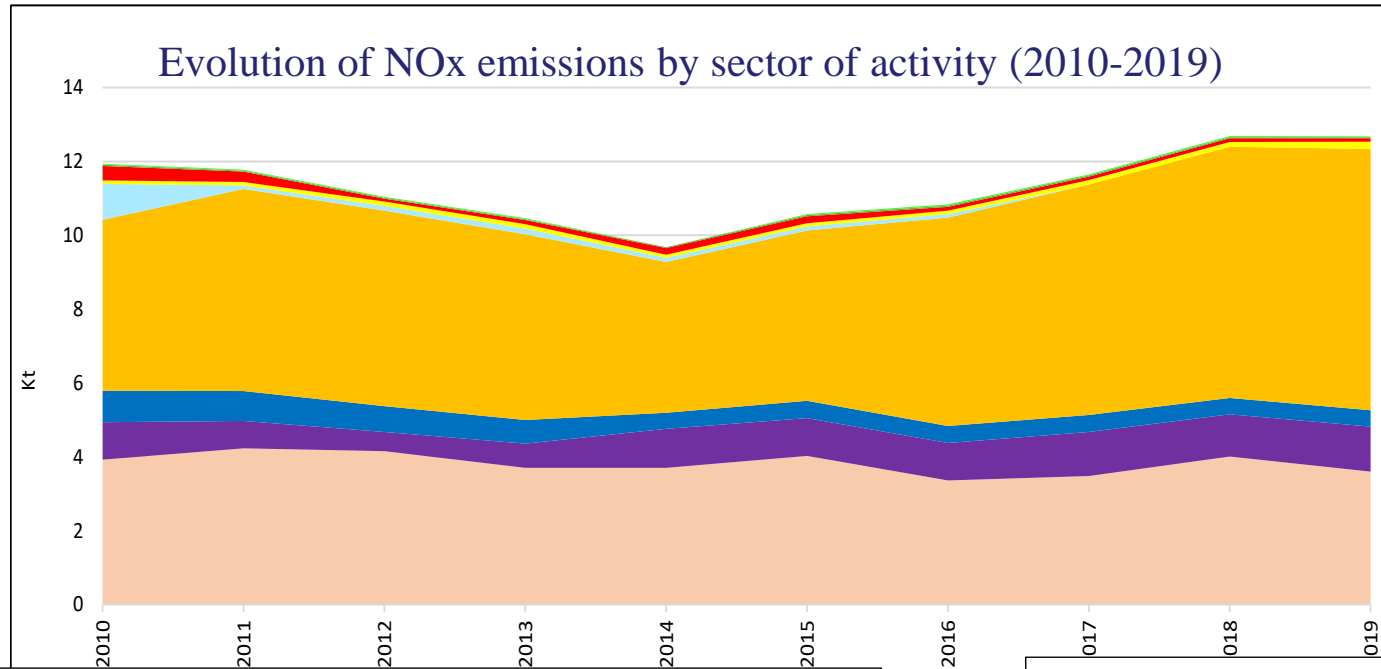


In 2019 24,9 kt including:
24,5 kt Public power

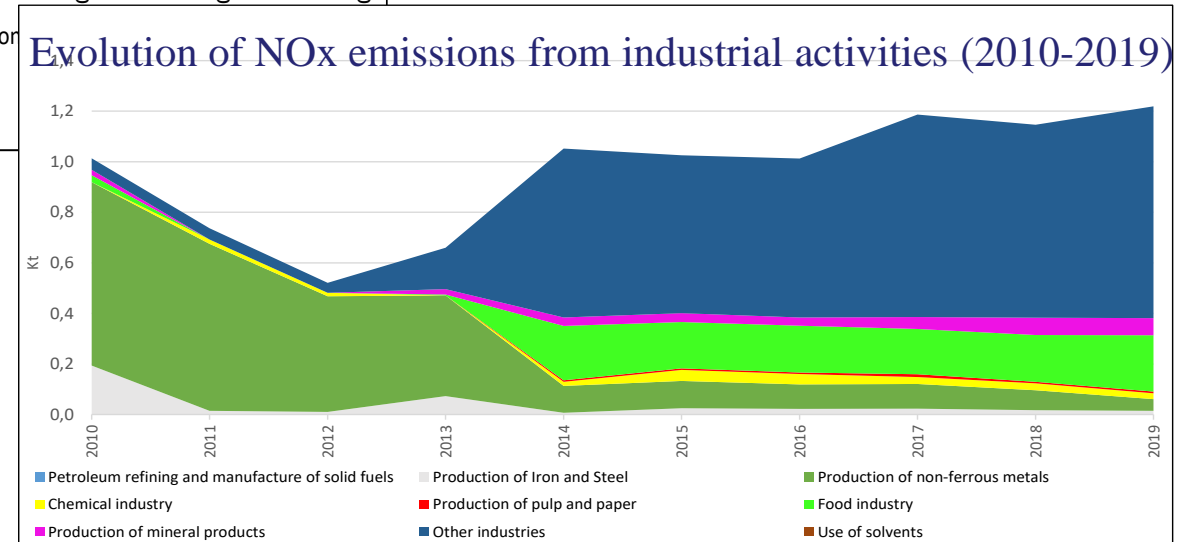
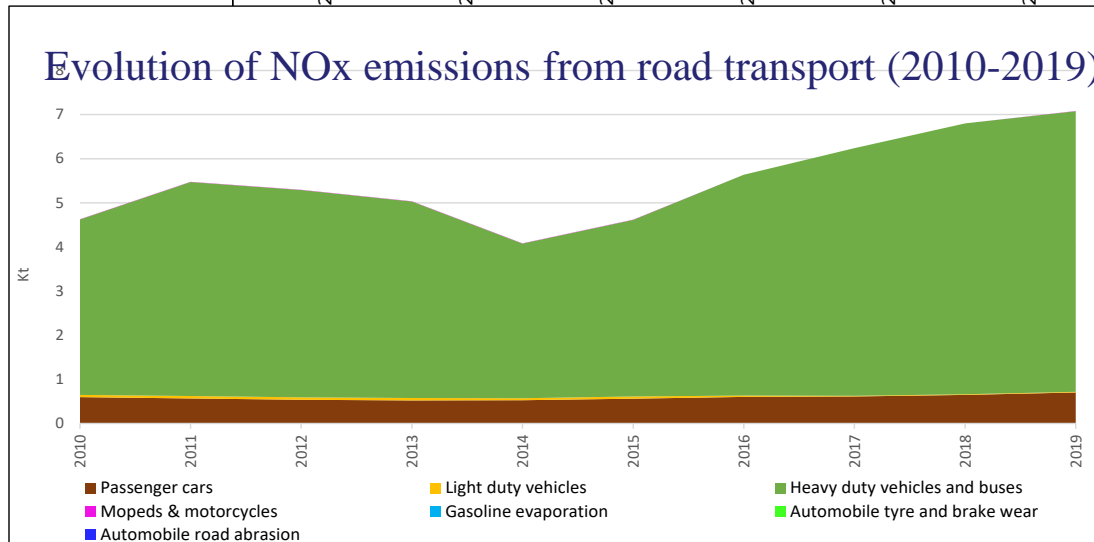


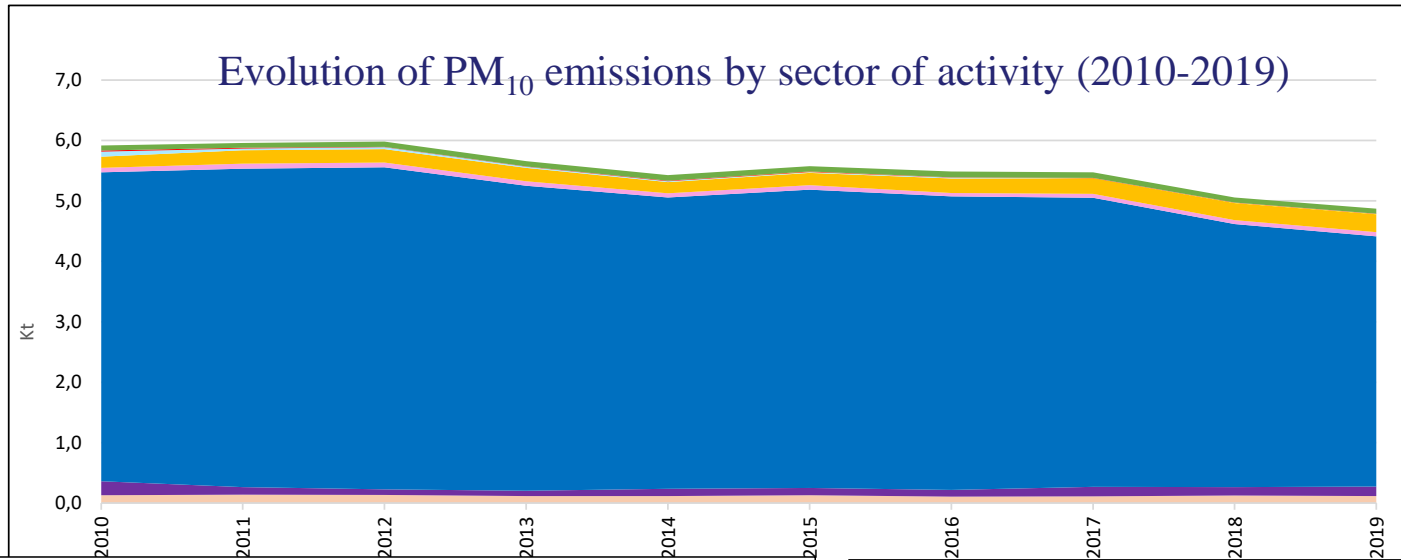
Source: Emission inventory submission 2021 for the Convention (CEIP web site)

Montenegro: main sources of NO_x

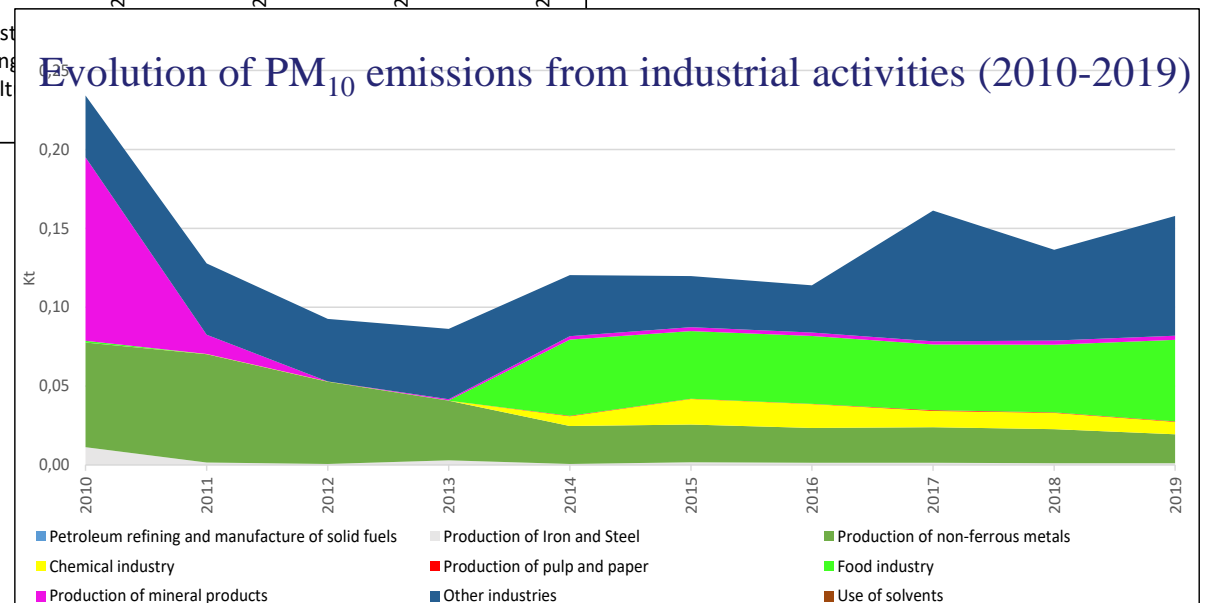
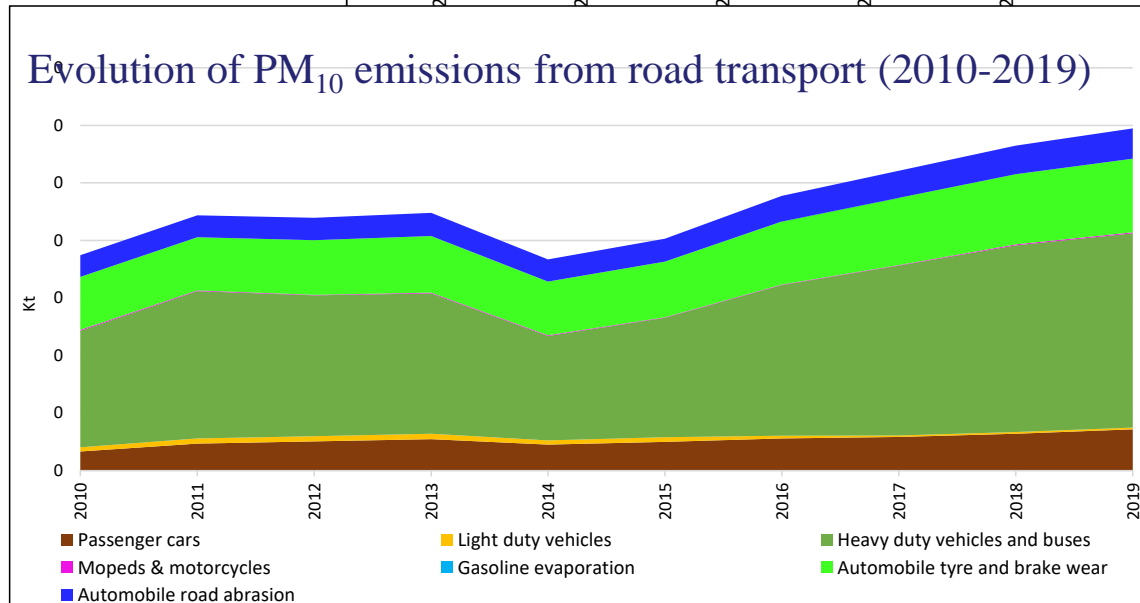


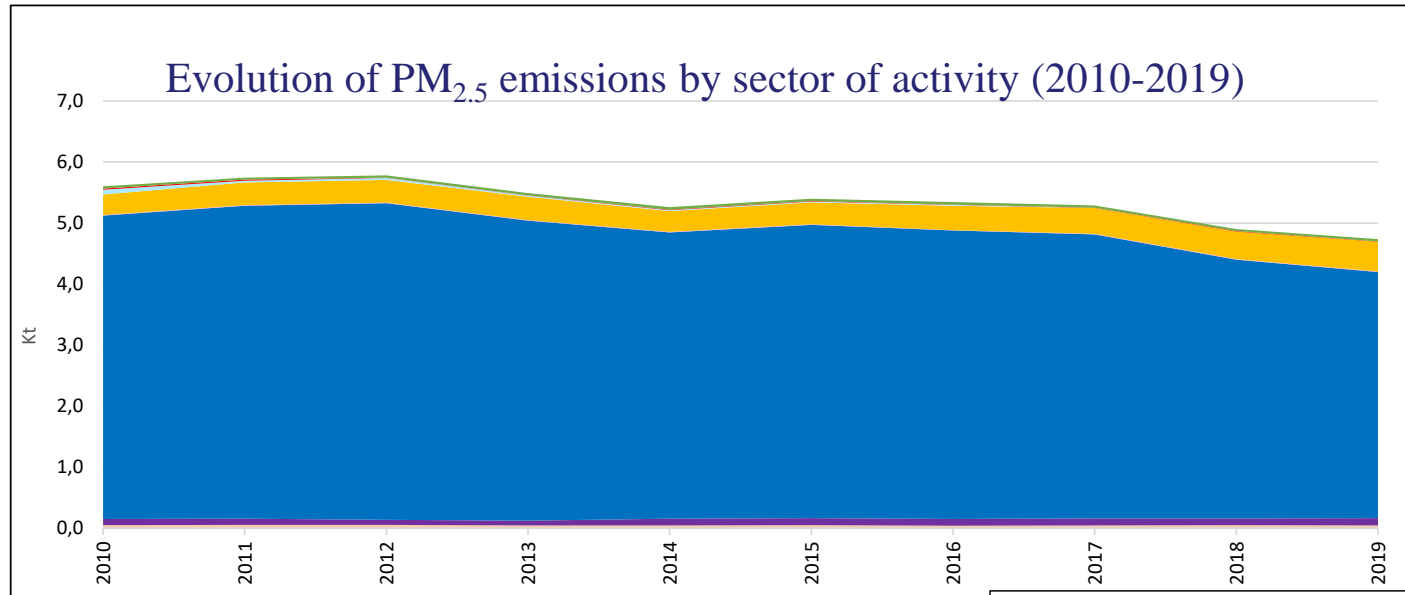
In 2019 12,7 kt including:
 7,1 kt Road transport
 3,6 kt Public power
 1,2 kt Industry



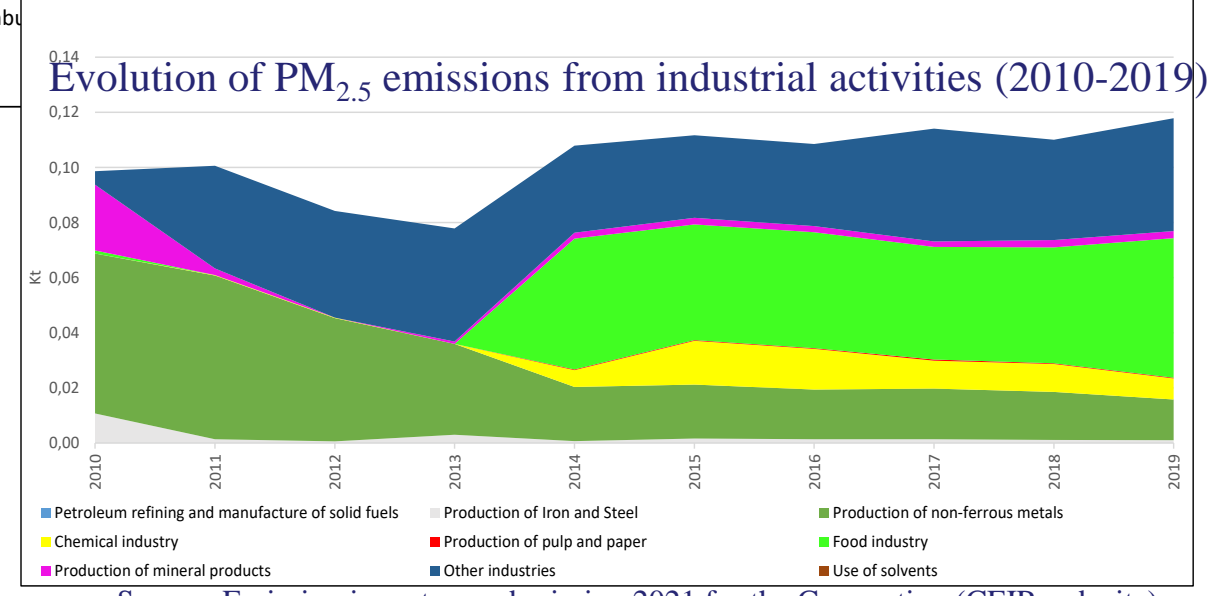
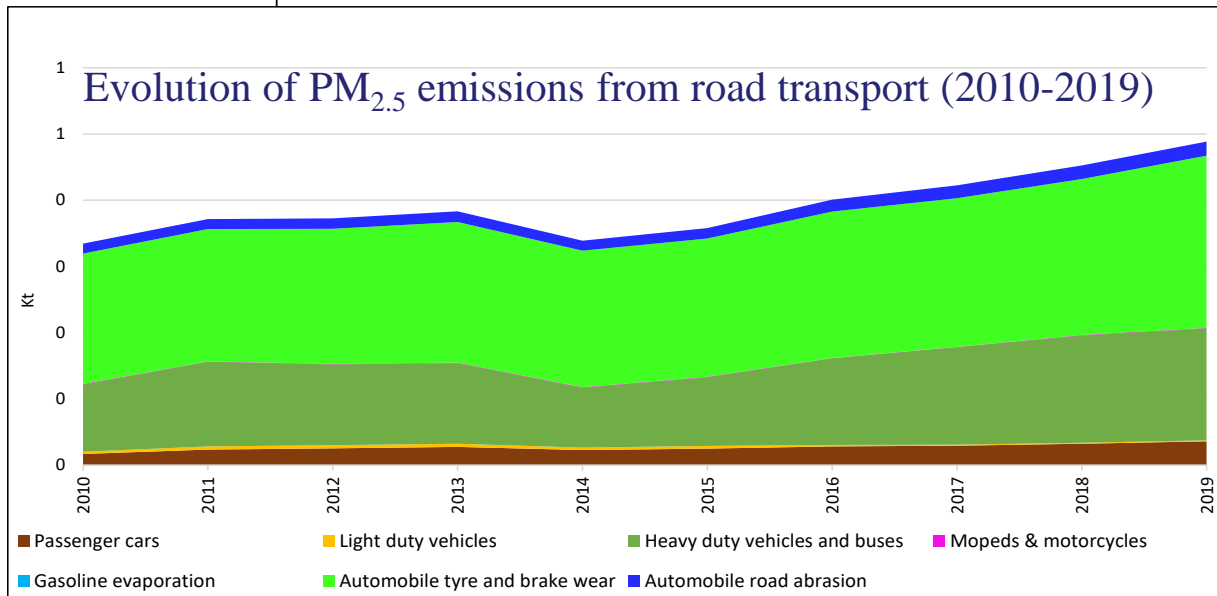


In 2019 4,9 kt including:
4,1 kt other stationary combustion

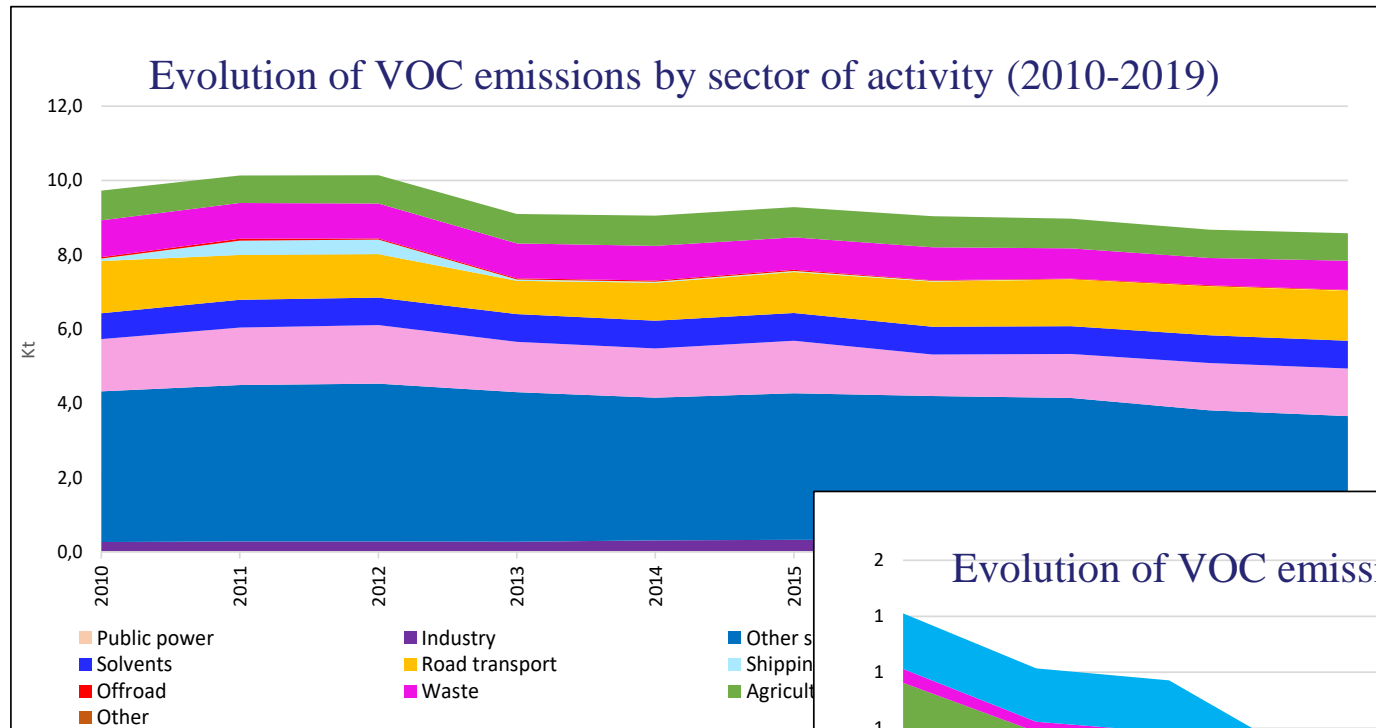




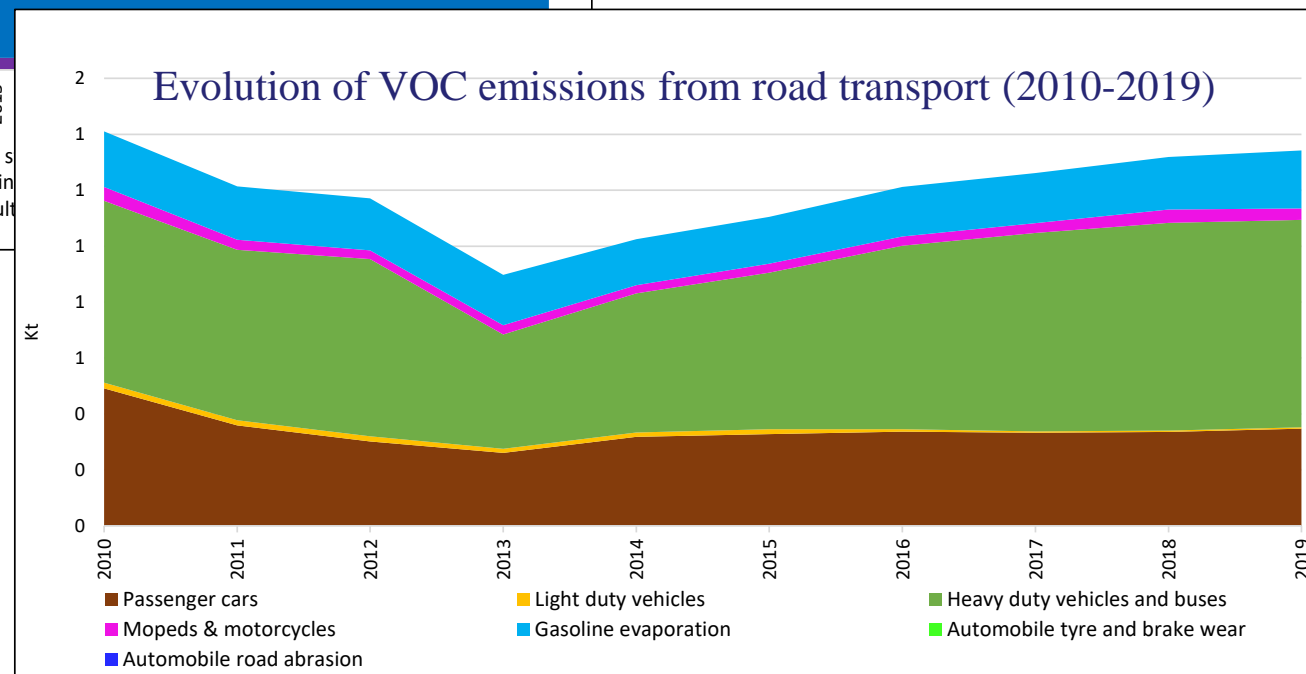
In 2019 4,7 kt including:
4 kt other stationary combustion

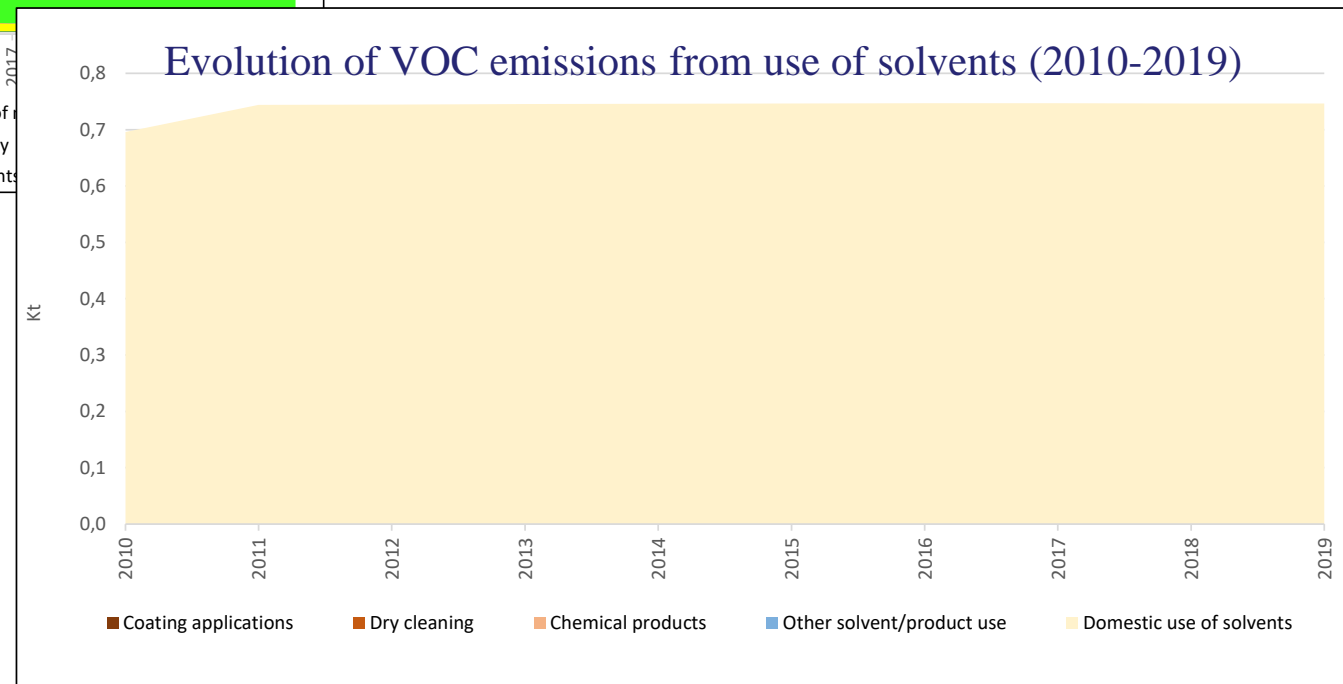
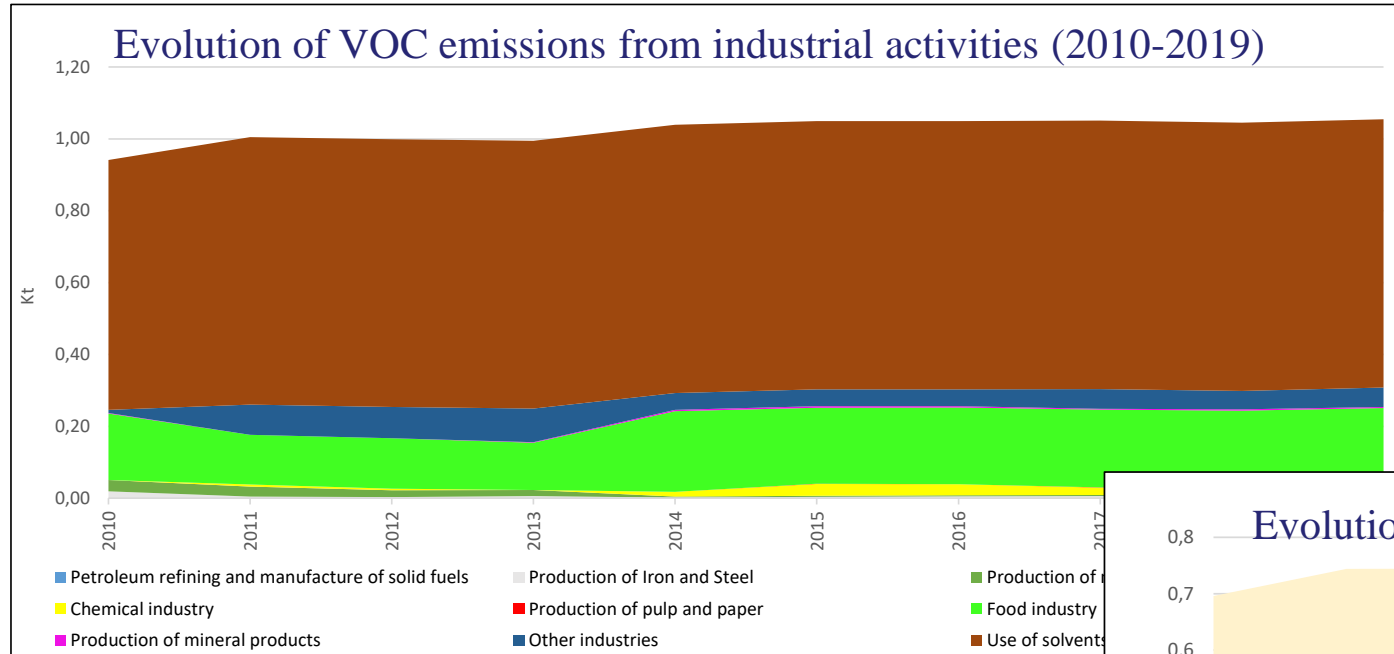


Montenegro: main sources of VOC



In 2019 8,6 kt including:
 3,3 kt other stationary combustion
 1,3 kt road transport
 1,3 kt Fugitive
 0,8 kt waste
 0,7 kt solvents and 0,7 kt agriculture livestock





- Case study 6: Montenegro
 - Ratification of Protocols
 - Air quality
 - Sources of emissions
 - Strategic documents, regulations in place and their evolution

- National strategy of sustainable development until 2030, 2016 (to be updated)
- The innovative Strategy 2019-2024
- The Traffic Development Strategy of Montenegro 2019-2035
- Energy and climate strategies of Montenegro 2030 are under revision, scheduled by the end of 2024
- National Air Quality Management Strategy 2021-2029 was developed and approved in 2021 by the EU (as a part of accession program) with the reduction commitment, however not adopted up to now

- National strategy of sustainable development until 2030, 2016 (to be updated)
 - Air Quality Management Plan for Podgorica was drafted focused on measures to reduce PM₁₀ emissions
 - Previously, due to exceedances of prescribed norms, Air Quality Management Plans for Pljevlja and Nikšić were prepared
 - For industry and energy plants, application of regulations and economic instruments with which transition to technologies and processes with lower emissions were outlined
 - Vehicle age/quality were tackled
 - Public network of air quality monitoring stations was established

- National Air Quality Management Strategy 2021-2029 was developed and approved in 2021 by the EU (as a part of accession program), however not adopted up to now
 - As a part of the negotiations between Montenegro and the European Union, the EU's Joint Position for Chapter 27 - environment and climate change, as one of the final benchmarks for closing the chapter, requires Montenegro to fully comply with the Directive (EU) 2016/2284 and present an analysis of economically viable emission control strategies for the period of 2020-2029, which will serve as the basis for the final agreement between the EU and Montenegro on its obligations to reduce emissions
 - These are in addition to regularly annual reporting the emissions, in accordance with the Directive, CLRTAP, and the creation of the National Pollution control program for air
 - Furthermore, Montenegro is expected to improve the implementation of the acquis of the EU in this area, through regular measures for reduction of air pollution at the national level, and especially in areas where EU limit values for air quality are exceeded, as well as through the creation or updating of air quality plans, in accordance with the Directive 2008 /50/EC

- Operational goals of the National Air Quality Management Strategy 2021-2029:
 - Reduction of SO₂ concentrations in the Northern zone of air quality through the ecological reconstruction of the Pljevlja Thermal Power Plant carried out by the Electric Power Company of Montenegro. The deadline for the completion of works on the installation of the waste gas desulphurization system is 2023
 - Reduction of concentrations of PM in the Northern and Central air quality zones through long-term synergistic actions on the parallel implementation of the next activities:
 - Improvement of household heating through reduced consumption of coal, wet wood for firewood, use of more efficient heating devices, transition to more environmentally friendly fuels, increase in energy efficiency of residential buildings, introduction of central heating systems, etc.
 - Preventive measures related to forest fires and stricter criminal policy related to prohibition of open burning of waste, including agricultural one

- Operational goals of the National Air Quality Management Strategy 2021-2029:
 - Improving data quality on air quality and air pollutant emissions through the following activities:
 - regular maintenance and calibration of measuring instruments and other air quality monitoring equipment
 - regular updating and improvement of the inventory of air pollutant emissions
 - establishment of monitoring of cross-border transfer of pollution in accordance with the EMEP program at the measuring point in Velimlje
 - development of mathematical air quality modeling methods in order to obtain data completed with indicative data for areas where measurements are not performed
 - Improvement of cooperation between relevant institutions, local self-government units, the civil sector and the professional public in the field of air protection through more intensive meetings and joint activities aimed at implementing the strategy, solving ad hoc issues and promoting air protection

- Operational goals of the National Air Quality Management Strategy 2021-2029:
 - Reduction of emissions of pollutants (NO_x, SO₂, VOC, NH₃ and PM_{2.5})
 - measures to reduce emissions of pollutants covered by Directive (EU) 2016/2284

Measures to be applied to SO₂ emission reduction for the period 2020-2029:

- **Installation the system for desulphurization of air emissions** in the Pljevlja Thermal Power Plant
- **Reduction of sulphur content in liquid fuels of petroleum origin and fuel replacement**

In 2011 the Regulation on limit values for the content of polluting substances in liquid fuels of petroleum origin was adopted which prescribe a reduced sulphur content in diesel fuel, fuel oil and marine fuels

The new **Regulation on limit values of the content of polluting substances in liquid fuels of petroleum origin** ("Official Gazette of Montenegro", no. 17/17) additionally tightened the limit values for the content of sulphur in marine fuels in accordance with Directive (EU) 2016/802 on the reduction of content of sulphur in certain liquid fuels



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Montenegro: Current emission regulations



- Operational goals of the National Air Quality Management Strategy 2021-2029:

Regulation on **limit values of the content of polluting substances in liquid fuels of petroleum origin** ("**Official Gazette of Montenegro**", no. 17/17)

This regulation prescribes the types of liquid fuels of petroleum origin, including gasoline, diesel fuels, fuels used in NRMM, vessels, and other gas oils.

It prescribes the limit values for polluting substances, the content of metal-based additives and other characteristics of the fuel, which, in terms of environmental protection, should meet the fuels that are placed on the market, fuel use on vessels in ports, territorial waters and exclusive economic zones and sulfur oxide emissions control zones, methods of determining and monitoring fuel characteristics, methods for reducing emissions of pollutants into the air and reporting on compliance with limit values of the content of pollutants.

Limit values of the content of pollutants and other characteristics of motor gasoline and diesel fuel are given in the Annexes 1 and 2 of the regulation, but currently under analyses

- Operational goals of the National Air Quality Management Strategy 2021-2029:

Regulation on **limit values of the content of polluting substances in liquid fuels of petroleum origin** ("Official Gazette of Montenegro", no. 17/17)

Gas oils that are intended or used as fuel for construction and other machinery, agricultural tractors, river vessels and vessels used for sports, recreation and leisure may be placed on the market if the sulfur content does not exceed 0.01g/kg (0.001% m/m)

Fuel oil can be marketed if the sulfur content does not exceed 10g/kg (1% m/m)

Exceptionally, fuel oil whose sulfur content exceeds 10g/kg (1% m/m) may be placed in traffic only for use:

- 1) in LCP whose emissions of SO₂ are in accordance with the limit values of pollutant emissions into the air, for which an integrated permit is issued, provided that the measurement of pollutant emissions is carried out by a legal entity that has a permit for measuring emissions from stationary sources
- 2) In plants with combustion chambers whose average monthly emission of SO₂ is equal to or less than 1700 mg/Nm³ at a content of 3% vol of oxygen in dry exhaust gas for which a permit is issued on the permitted emissions of pollutants into the air

- Operational goals of the National Air Quality Management Strategy 2021-2029:

Measures to be applied to SO₂ emission reduction for the period 2020-2029

- Kombinat aluminum Podgorica (KAP), the largest industrial plant in Montenegro, starting in 2019 uses liquefied natural gas for the technological process, instead of fuel oil. During the period 2005-2018, SO₂ and NO_x emissions in KAP were reduced even without taking into account the transition to liquefied natural gas
- Željezara Nikšić, iron and steel production plant, also plans to replace its boiler plant, which will use liquefied natural gas as fuel, in order to bring the emissions from this plant in line with the integrated permit
- The goal of reducing SO₂ emissions in the period (2020-2029) can be ambitious because in the coming period, the environmental reconstruction of the Pljevlja Thermal Power Plant, which represents the most important source of emissions, is planned. In accordance with the Action Plan for the implementation of the Environmental Protection Program of this company, a system of wet scrubbers will be installed in the Pljevlja Thermal Power Plant, the performance of which is estimated at 90% efficiency. In the best case, this would achieve a reduction of around 80% of the total current national SO₂ emissions
- **However, the most optimistic estimate of the reduction of SO₂ emissions compared to 2005 is of 50%**

Measures to be applied to NO_x emission reduction for the period 2020-2029

- **Installation the system to abate NO_x emissions** in the Pljevlja Thermal Power Plant

As a part of the environmental reconstruction of the Pljevlja Thermal Power Plant, by 2023 it is planned to install a system to abate NO_x emissions , which will reduce emissions from this source by up to 70% in Pljevlja and represents a reduction of more than 35% in total national emissions

- **Increasing the use of alternative fuels, new generation vehicles and electromobility in traffic**

In Podgorica, the increased concentrations of NO_x are the result of intensive traffic, and in the coming period, increased concentrations can be expected at the new measuring point that was established to monitor the impact of traffic (Zabjelo)

In 2017, about 198,500 passenger vehicles were registered in Montenegro. So, in 2029 the total number of passenger vehicles is expected to increase to 246,695 with the firsttime registered vehicles of 26,881

During this period, the number of diesel-powered cars is supposed constantly decreasing, then the number of gasoline-powered cars, hybrid cars, and electric cars increasing, while the number of LPG-powered passenger cars is supposed to stay approximately constant

The proposed measure can contribute to the reduction of NO_x emissions by up to 75% from the road transport sector, while VOC emissions could increase by 12%, due to the significantly increased use of motor gasoline compared to diesel fuel

Measures to be applied to NO_x emission reduction for the period 2020-2029

- **Increasing the use of alternative fuels, new generation vehicles and electromobility in traffic**

Implementation of the measure is ongoing. Emissions of NO_x from road traffic (trucks and passenger vehicles) have already been partially reduced, due to the introduction of catalysts in cars, as well as the introduction of increasingly strict standards for emissions when importing used and new cars compared to 2005

Through the "Development of low-carbon tourism in Montenegro" project, a certain number of electric tourist vehicles were procured. The dynamics of the implementation of this measure will be dictated by the market, and in order for it to be implemented faster and lead to better results in terms of reducing emissions, it is necessary to plan appropriate regulatory and fiscal instruments

For the transport sector, in which there is a constant trend of energy consumption growth and an increased share of diesel vehicles in the fleet, studies were prepared on the potential of biofuel production and use, the potential of introducing other alternative fuels into the transport sector, the potential of energy efficiency in transport and an action plan for sustainable use of energy in traffic. In addition to the increased use of biofuels, an increase in the level of use of alternative fuels (liquefied petroleum gas-LPG and compressed natural gas-CNG) and electricity in traffic is expected, including the development of infrastructure. Within the project "Development of sustainable use of energy" financed from EU support funds (through IPA 2011), activities on the preparation of the Study on potentials for improving energy efficiency in the transport sector were finalized

Measures to be applied to NO_x emission reduction for the period 2020-2029

- **Increasing the use of alternative fuels, new generation vehicles and electromobility in traffic**

The Rulebook on marking the energy efficiency of vehicle tires and other parameters was adopted in 2017 and was recently updated **Regulation on marking the energy efficiency of vehicle tires and other parameters ("Official Gazette of Montenegro", 119/22 of October 26, 2022)**. Together with the **Regulation on technical requirements for vehicles imported or first placed on the market in Montenegro ("Official Gazette of Montenegro", no. 05/15 of 30.01.2015, 63/18 of 28.09.2018, 10/19 of 13.02.2019, 68/20 of 08.07.2020, 16/21 of 17.02.2021)** they prescribe conditions regarding the limit values of exhaust emissions and noise level of the EURO 6 standard for new vehicles, and the EURO 4 standard for second-hand vehicles

In addition, in the past years, certain initial activities were implemented in terms of supporting projects, the implementation of which can be linked to the increase of energy efficiency in the transport sector. Namely, UNDP and the Ministry of Sustainable Development and Tourism are implementing the innovative project "Development of low-carbon tourism in Montenegro" (GEF)

Before 2021, a polycentric sustainable urban mobility plan (Poly-SUMP) was prepared for Boka Kotor and Cetinje.

The implementation of activities on the development of a SUMP for the capital Podgorica and support to other cities in Montenegro in the development of sustainable urban mobility solutions is planned.

Measures to be applied to NO_x emission reduction for the period 2020-2029

- **Increasing the use of alternative fuels, new generation vehicles and electromobility in traffic**

Podgorica already has over 12 km of existing infrastructure, and with the construction of the last of the five projected green ways, it will have about 15 km. Work is underway on two cycling routes with a total length of about 30 kilometers, which are intended for more experienced cyclists

Combined application of installation the system to abate NO_x emissions in the Pljevlja Thermal Power Plant and increasing the use of alternative fuels, new generation vehicles and electromobility in traffic could result in a total reduction of NO_x emissions by 55%, while emissions from key sources (energy production, road traffic) should be reduced by (70-75)%

Although the reduction of NO_x emissions from energy production is certain, the reduction of NO_x emissions from traffic through the renewal and change of the structure of the vehicle fleet is an expensive and long-term process that can hardly be achieved in the next 10 years, particularly bearing in mind the fact that the share of new first-time registered of passenger vehicles in the total number of registered passenger vehicles in 2018 was only 1.1%

Based on available data, by 2030 NO_x emission reductions of up to 15% can be expected

Measures to be applied to PM and VOC emission reduction for the period 2020-2029

- **Increasing the use of alternative fuels, new generation vehicles and electromobility in traffic**

To reduce PM emissions, the next measures in industry and energy production were applied in the previous period:

- Commissioning of a new electric arc furnace with a built-in system for dedusting gases in the Nikšij Ironworks and disconnection of the old furnace from the production system (2012)
- In the "Pljevlja" thermal power plant, an overhaul of the electrostatic precipitator for controlling the emissions of PM was carried out (2013). For 2021, the values measured after the overhaul of the filter were within the prescribed limits
- Through the environmental reconstruction of the Pljevlja Thermal Power Plant, further optimization of the electrostatic precipitator is planned in order to comply with the requirements of the new BAT for large combustion plants
- By changing the fuel (from fuel oil to natural gas) in the anode baking furnace and Bertrams boiler plants in KAP, emissions of PM were significantly reduced (2018)
- Further planned investments in this facility will achieve significant reductions in PM emissions in the Electrolysis facility

Measures to be applied to PM and VOC emission reduction for the period 2020-2029

- Before 2021, the Ministry of Economy passed 17 regulations transposing EU regulations for the introduction of eco-design requirements and 6 regulations transposing EU regulations for marking the energy efficiency of products that affect energy consumption
- For most product application began on January 1, 2019, except for light bulbs, for which application began in 2018
- In this context, regulations governing requirements for space heating devices are of particular importance

Measures to be applied to PM and VOC emission reduction for the period 2020-2029

1. Rulebook on the technical requirements of **eco-design for devices for space heating and combined heating devices** ("Official Gazette of Montenegro", No. 035/19 od 24.06.2019) (NO_x emissions)
Transposition of Commission Regulation (EU) 813/2013 of 2 August 2013 implementing Directive 2009/125/EC (Ecodesign Directive) with regard to ecodesign requirements for space heaters and combination heaters
2. Rulebook on the technical requirements of **eco-design for devices for local space heating** ("Official Gazette of Montenegro", No. 076/22 od 21.07.2022) (NO_x emissions)
Transposition of Commission Regulation (EU) 2015/1188 of 28 April 2015 implementing Directive 2009/125/EC (Ecodesign Directive) with regard to ecodesign requirements for local space heaters
3. Rulebook on the technical requirements of **eco-design for devices for solid fuel local space heating** ("Official Gazette of Montenegro", No. 035/19 od 24.06.2019) (NO_x, PM, VOC emissions)
Transposition of Commission Regulation (EU) 2015/1185 of 24 April 2015 implementing Directive 2009/125/EC (Ecodesign Directive) with regard to ecodesign requirements for solid fuel local space heaters
4. Rulebook on the technical requirements of **eco-design for boilers using solid fuels** ("Official Gazette of Montenegro", No. 035/19 od 24.06.2019) (NO_x, PM, VOC emissions)
Transposition of Commission Regulation (EU) 2015/1189 of 28 April 2015 implementing Directive 2009/125/EC (Ecodesign Directive) with regard to ecodesign requirements for solid fuel boilers

Measures to be applied to PM and VOC emission reduction for the period 2020-2029

In addition to implementation of eco-design regulations, the Ministry of Economy has been implementing **financial support programs** for energy efficiency (EE) investments for a long time:

- ENERGY WOOD - interest-free loans for installation of heating systems on modern forms of biomass (before 2018)
- ENERGY EFFICIENT HOME - interest-free loans for the installation of modern forms of biomass heating systems and the performance of works to improve the energy characteristics of the building envelope (since 2018)
- Subsidized procurement of briquettes and pellets in Pljevlja - during 2015-2019 heating seasons

In the previous period, several units of local self-governments continued the implementation of the subsidy program for the installation of solar systems in new buildings, through the reduction of communal fees



Measures to be applied to PM and VOC emission reduction for the period 2020-2029

- **Construction of the system for district heating in Pljevlja**

Elektroprivreda Crne Gore AD Nikšić, as part of the ecological reconstruction of the Pljevlja thermal power plant, has foreseen works on the construction of the base, peak and reserve heating source of the city, as well as exchange substations within the Pljevlja thermal power plant with a capacity of up to 50MW, which will significantly speed up the implementation of this project

Certain funds have already been allocated from the capital budget for the construction of the infrastructure for district heating in Pljevlja

In the coming period, it is necessary to plan the construction of the district heating network and the infrastructure for connecting households to the network

Measures to be applied to PM and VOC emission reduction for the period 2020-2029

- **Use of renewable energy sources**

The largest project started is the Briska Gora solar power plant with an installed capacity of 250 MW, the construction of which will be carried out in phases (I phase 50 MW, and II phase 200 MW)

Wind power plants Krnovo (72 MW) and Možura (46 MW) are already in operation, while VE Gvozd (55 MW) and SE Velje Brdo (50 MW) are in the phase of preliminary analysis, and VE Brajići with a total installed capacity of 100 MW is in the phase tender announcements

In addition, in recent years, existing hydroelectric plants and small hydroelectric plants have been revitalized, 11 new small hydroelectric plants have been built, and in the coming period, the construction of one large and several small hydroelectric plants is planned

Measures to be applied to PM and VOC emission reduction for the period 2020-2029

- Prohibition of burning of residues harvests and agricultural waste

The measure is recommended by Directive (EU) 2016/2284, Annex III Part 2 B (points 1 and 2). The ban on open burning waste is prescribed by **Law on Waste Management (“Official Gazette of Montenegro” no. 064/11 and 039/16)** whereby the burning of harvest residues and agricultural waste is not explicitly stated

This measure is also recommended through **the Code of Good Agricultural Practices (MPRR, 2013)**

Measures to be applied to PM and VOC emission reduction for the period 2020-2029

In addition, special measures to reduce VOC emissions are reflected in :

- Application of the regulations on VOC emissions from the use of paints and varnishes is going through **Regulation on the prohibition and restriction of the use, placing on the market and production of chemicals that represent an unacceptable risk to human health and the environment (“Official Gazette of the Republic of Montenegro” No. 70/18 of 31.10.2018, 076/20 of 28.07.2020, 134/22 of 07.12.2022)** which is in force (to be further analyzed)

Measures to be applied to PM and VOC emission reduction for the period 2020-2029

Rulebook on the type of activities, **emission limit values and methods performing monitoring in plants using organic solvents** (“Official Gazette of Montenegro”, No. 030/20 od 07.04.2020)

The activities covered:

- 1) application of glue (adhesive) is a process in which glue (adhesive) is applied to a surface, except for adhesive coatings and production
- 2) coating process is any activity in which coating layers are applied once or repeatedly to:
 - a) on the following vehicles: new vehicles from category M1, and category N1 if they are coated in the same plant as vehicles of category M1; - truck cabins for accommodating drivers, as well as all integrated accommodation spaces for technical equipment of vehicles of category N2 and N3; vans and trucks of categories N1, N2 and N3, but not truck cabins; buses of vehicle category M2 and M3; trailers of categories O1, O2, O3 and O4;
 - b) Metal and plastic surfaces, including surfaces of airplanes, ships, trains, and others;
 - c) wooden surfaces;
 - d) textiles, fabrics, foil and paper surfaces;
 - e) the skin

ELV are coherent with the AGP (Annex VI, to be further analysed)

Measures to be applied to PM and VOC emission reduction for the period 2020-2029

- Application of the **Regulation on technical conditions for air protection from emissions of volatile organic compounds resulting from the storage, transfer and distribution of petrol** (“Official Gazette of the Republic of Montenegro” no. 07/14, 008/19 from 06.02.2019) , which is also in force

Taking into account the economic analysis that was prepared for the proposed set of measures, as well as the fact that almost all the proposed measures are already in various stages of implementation, Montenegro will implement these measures in the coming period to the extent that financial resources will allow. The proposed set of measures will be included in the updated Air Quality Management Strategy (expected in 2023)



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Montenegro: Current emission regulations



The Directive 2010/75/EU on Industrial Emissions (IED) has transposed into Montenegrin legislation through the new Law on Industrial Emissions **Law on Industrial Emissions ("Official Gazette of the Republic of Montenegro", no. 17/19 and 3/23)** and accompanying bylaws

Law on Industrial Emissions ("Official Gazette of the Republic of Montenegro", no. 17/19 and 3/23) regulates the set of measures aimed at prevention and control of emissions deriving from industrial plants located on the territory of Montenegro (rules and topics for the integrated prevention and control of industrial environmental pollution).

Adopted principles of integrated pollution prevention and control are as follows:

- general environmental protection-precautionary principle;
- principle of integrated approach;
- principle of sustainable development;
- principle of waste hierarchy;
- polluter pays principle;
- principle of access to information and public participation (see article 4 for detailed contents).

Law on Industrial Emissions ("Official Gazette of the Republic of Montenegro", no. 17/19 and 3/23)

- The integrated environmental permits
- Best available techniques and criteria for their determining
- Emission limit values, equivalent parameters and technical measures
- Provisions for:
 - Large and medium-sized combustion plants
 - Waste incineration and co-incineration plants
 - Plants using organic solvents
 - Plants producing titanium dioxide
 - Mercury, mercury compounds and mixtures plants
 - Preparation of annual inventory and reporting
- LCP with a total nominal input thermal power of 100 MW or more is obliged to provide continuous monitoring of emissions of SO₂, NO_x and PM in waste gases
- Inspection and surveillance provisions and penalty measures

Law on Industrial Emissions ("Official Gazette of the Republic of Montenegro", no. 17/19 and 3/23)
accompanying bylaws:

1. Rulebook on the form of **integrated permit** ("Official Gazette of Montenegro", No. 059/19 dated 23.10.2019, 060/21 dated 08.06.2021)
2. Rulebook on content and method of application for an **integrated permit** ("Official Gazette of Montenegro", No. 055/20 od 12.06.2020)
3. Regulation on **limit values of emissions from combustion plants** and method of calculating emission limit values for plants using multiple types of fuels ("Official Gazette of Montenegro", No. 129/21 dated 15.12.2021)
Limit values of emissions of polluting substances into the air from existing and new large combustion plants are applied from 15/11/2021 and are aligned with the ELVs of AGP
4. Rulebook on method and procedure for **monitoring of emissions from stationary sources** ("Official Gazette of Montenegro", No. 039/13 dated 07.08.2013)
5. Rulebook on the type of activities, **emission limit values and methods performing monitoring in plants using organic solvents** ("Official Gazette of Montenegro", No. 030/20 od 07.04.2020)



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6. Rulebook on emission limit values, technical measures for **exemption** of application of limit values and monitoring methods (“Official Gazette of Montenegro”, No. 061/20 od 24.06.2020)
7. Rulebook on criteria for determination of the **best available techniques** for environment protection and the list of pollutants from industrial installations (“Official Gazette of Montenegro”, No. 035/19 od 24.06.2019)
8. Rulebook on the method of performing **monitoring of emissions** in water and **air** from plants that produce **titanium dioxide** (“Official Gazette of Montenegro”, No. 070/20 of 15 July 2020) (continuous monitoring)
9. Rulebook on the limit values of the emissions of pollutants, method of performing **monitoring** and operating conditions of the plant for **incineration and co-incineration of waste** (“Official Gazette of Montenegro”, No. 079/20 of 02.08.2020)
10. Regulation on **Emission Limit Values of Air Pollutants from Stationary Sources** (“Official Gazette of Montenegro”, 10/2011 of 11 February 2011, 129/21 of 15 December 2021) (to be further analysed)



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Law on Industrial Emissions ("Official Gazette of the Republic of Montenegro", no. 17/19 and 3/23)

Conclusions on the best available techniques are translated and published by the Ministry on its website, including:

- LCP
- Cement, lime and magnesium oxide industry
- Iron and steel production
- Non-ferrous metal industries
- Production of cellulose paper and cardboard
- Surface treatment using organic solvents including protection of wood and products from wood with chemicals
- Food industry, the beverage industry and the milk industry
- Waste treatment
- Poultry and pig farming
- Air and water emissions monitoring

ELVs of the BATs for industrial sources and LCP that are lower or equal of the ones in the Annexes of VI, V, and X of the AGP so far

Overview of the issued permits for the existing plants

Operator-plant	Location of activity	Type of activity	Date of permit issuing/ permit validity	Date of permit revision	Competent authority
„FAB LIVE“ Podgorica	Mahala bb. Podgorica	2.6 Plants for surface treatment of metals and plastic materials using electrolytic or chemical processes, where the volume of the bathtub for treatment exceeds 30 m ³	13.12.2013, permit revision: 10/2018/validity period- 5 years	2023	City of Podgorica
„Alu-line“ Vojislava Šćepanovića, bb Mojkovac	In the part of the flotation plant of the old mine „Brskovo“ in Mojkovac	2.6 Plants for surface treatment of metals and plastic materials using electrolytic or chemical processes, where the volume of the bathtub for treatment exceeds 30 m ³	31.07.2014/5	2019 „Aluline“ Mojkovac has ceased to operate so there will be no revision of the permit.	Municipality Mojkovac
„Montenegrin Electric Enterprise“ AD Nikšić	Kalušići bb, Pljevlja	1.1 Thermal power plants with a thermal input exceeding 50 MW	22.03.2018/ 5	2023	Agency for Nature and Environment Protection
„Deponija“ Podgorica	Ul. Španskih boraca bb Podgorica	5.3 Facility for the disposal of non-hazardous waste with a capacity exceeding 50 t per day	13.03.2013/ 5 25.03.2018 (extended permit)/ 6 years	03/2024	Agency for Nature and Environment Protection



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Montenegro: Current emission regulations



Review of submitted applications for issuing operating permits for existing plants

Operator-plant	Operator's address	Type of activity	Application date	Permit status	Competent authority
TOSCELIK NIKŠIĆ Steel, Nikšić	VUKA KARADŽIĆA BB Nikšić	2.2 and 2.3 Production of pig iron or steel (primary or secondary fusion) including continuous casting, with a capacity exceeding 2,5 tonnes per hour and Processing of ferrous metals:	27.12.2018/ 5 18.04.2019 / 5 years	04/2023	Agency for Nature and Environment Protection
KAP, aluminum factory Podgorica AD	DAJBABE B.B., Podgorica	2.5 Processing of non-ferrous metals	30.12.2016.	Ministry issued a conclusion on suspension of the proceedings until determining who the operator plant and the taxpayer to obtain integrated work permit.	Agency for Nature and Environment Protection
POLIEX AD, Explosives factory	Police bb, Berane	4.6 Production of explosives	Poliex AD submitted the request to the ANEP for int. permit on 29.10.2018, which was returned for amending on October 30, 2018, and afterwards requested an extension of the deadline, which was granted. After the expiry of the	ongoing procedure	Agency for Nature and Environment Protection

- **Case study 6: Montenegro**
 - Ratification of Protocols and strategic documents
 - Air quality
 - Sources of emissions
 - Regulations in place and evolution of the legislative frame work
 - Technological pathway

Montenegro: Technological Pathway to comply with the AGP technical provisions

PM (Annex X)

A key sector in Montenegro for which only recommended limit values are proposed by the AGP is **domestic heating** with solid fuels

- The role of policies related to energy efficiency and energy saving is crucial
- Use of most efficient appliances, based on the Code of good practices for wood burning and small combustion installations developed by UNECE

In all industrial sectors covered:

Fabric filters and electrostatic precipitators are the techniques recommended to able compliance with limit values implemented by the Annex X

- Fabric filters
- Electrostatic precipitators

When desulphurisation is also conducted, the following techniques are also available:

- wet flue-gas, desulphurisation (FGD)
- dry or semi-dry FGD system

The proper sizing of the equipment is essential

Kazakhstan: Technological Pathway to comply with the AGP technical provisions

SO_x Annex IV:

Large combustion plant - the key sector for action and industry

The following secondary measures can be used

- boiler sorbent injection
- dry sorbent injection (DSI)
- spray dry absorber (SDA)
- wet flue-gas desulphurisation (FGD)

associated with the use of low Sulphur content solid or liquid fuels

Montenegro: Technological Pathway to comply with the AGP technical provisions

NO_x Annex V

A combination of primary and secondary measures in large combustion plants and industry

- combustion optimisation
- combination of primary techniques for NO_x reduction such as air or fuel staging, flue-gas recirculation, low-NO_x burners (LNB)
- selective non-catalytic reduction (SNCR)
- selective catalytic reduction (SCR)

Montenegro: Technological Pathway to comply with the AGP technical provisions

VOC from solvent uses in certain activities (Annex VI)

Depending on activities using solvents, primary measures (reduction of the solvent content of products, increase of efficiency of application devices, changes of products) and end of pipe techniques such as adsorption and oxidation

Solvent in paints (Annex XI)

Development of products with reduced solvent content or without solvents (water based or solvent free)

Technological Pathway to comply with the AGP technical provisions

Mobile sources (Annex VIII)

There is no production of vehicles of Non Road Mobile Machineries in Montenegro

Only vehicles or NRMM compliant with standards enabling the lowest emissions should be imported (at least, equivalent to Euro 6 standards for road vehicles, EU regulation 2016 stage V for NRMM)

- **Case study 6: Montenegro**
 - Ratification of Protocols and strategic documents
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 - Sources of emissions
 - Regulations in place and evolution of the legislative frame work
 - Technological pathway
 - Conclusions

- Air quality: the main concerns are PM_{10} and $PM_{2.5}$ concentrations in all the territory, and SO_2 in the northern part of the country
- Residential heating is the major source of $PM_{2.5}$, PM_{10} and VOC emissions driven by the use of solid fuels in small domestic heating appliances. The road transport is the main source of NO_x emissions. The emissions from industrial sources are much less significant due to the few existing installations. The only existing LCP burns local coal is the important source of SO_2 emissions
- Implementation of the National Air Quality Management Strategy 2021-2029 with important measures to reduce SO_2 , NO_x , $PM_{2.5}$, VOC is coherent with the technological pathway proposed for the main emitting sectors of Montenegro and in line with the all Annexes of AGP under the study, however, was not adopted up to now

- Technical solutions for small domestic heating appliances exist but are not sufficient. Energy saving and energy efficiency are essential. Links to be made with energy and climate policies
- Montenegro has transposed several EU directives such as the EU eco-design and has extensive financial programs to improve energy efficiency
- The use of Code of good practices for wood burning and small combustion installations developed by UNECE is recommended

- The adoption of provisions of several EU Directives such as the Industrial emission directive, sulphur in fuels directive, etc. in the national legislative framework should enable the consistency with limit values of the AGP technical annexes for stationary sources IV (SO₂), V (NO_x), VI (VOC industry), X (PM) and annex XI (VOC paints).

By the implementation of the provisions in key EU Directives in its legislative framework, Montenegro would be in the condition to have a consistent legislative framework with the requirements of the four AGP technical annexes IV, V, VI, X and XI, in particular their ELVs, tentatively around 2025-28

Thank you very much
for your attention!

Questions?

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