On the basis of Article 38, paragraph 1 of the Law on the Planning System of the Republic of Serbia ("Official Gazette of the RS", No. 30/18)

The Government adopts

AIR QUALITY PROGRAMME OF THE REPUBLIC OF SERBIA FOR THE PERIOD 2022-2030 WITH AN ACTION PLAN

1 INTRODUCTION

Harmful effects of air pollution are well known and ambient Air pollution is a major environmental risk to health. The pollution is a mix of chemicals, particulate matter, and biological materials that react with each other to form tiny hazardous particles. The concentration of particulate matter (hereinafter: PM) is a key air quality indicator since it is the most common air pollutant that affects short term and long-term health. The smaller particles are more concerning since they don't stop in the upper airways but rather penetrate deep into the cardiopulmonary system. A 2013 assessment by WHO's International Agency for Research on Cancer (IARC) concluded that outdoor air pollution is carcinogenic to humans, with the particulate matter component of air pollution most closely associated with increased cancer incidence, especially lung cancer. Furthermore, poor air quality contributes to breathing problems, chronic diseases, increased hospitalization, and premature mortality. In addition to particulate matter, exposure to even short period of high concentration SO_2 can harm the human respiratory system and make breathing difficult. People with asthma, particularly children, are sensitive to these effects of SO_2.
Ozon at ground level which is mainly formed during the summer months by the reaction with sunlight (photochemical reaction) of pollutants such as nitrogen oxides (hereinafter: NO_x) from vehicle and industry emissions and volatile organic compounds (hereinafter: VOCs) can cause breathing problems, trigger asthma, reduce lung function and cause lung diseases. In addition to the above-mentioned pollutants the symptoms of bronchitis in asthmatic children increase in association with long-term exposure to NO_2.

In order to respond to the persisting problem of air pollution, numerous local communities and cities in the Republic of Serbia have already prepared or initiated the preparation of the local Air Quality Plans, furthermore the Government adopted National plan to reduce emissions of major pollutants from old large combustion plants ("Official Gazette of the Republic of Serbia". No 10/20: the NERP) in order to address the emissions from the biggest air pollution source in the country, however since additional actions are needed both at the national and local level, Serbia prepared, for the first time, the Programme of Air Quality in the Republic of Serbia for the period 2022-2030 with accompanying action plan (hereinafter: the Programme).

The National Environmental Protection Programme ("Official Gazette of the Republic of Serbia", No. 72/09), adopted in 2009, has expired in the meantime, so listing the short-term and medium-term goals defined therein is not recommended. However, it should be stated in the introduction that in the previous period goals and measures related to air protection have been planned through the National Environmental Protection Programme (*"improved air quality pursuant to prescribed requirements for air quality through reduction of emissions from the energy, industry,*

transport sectors and so on", and *"adopted and implemented international agreements in the area of air protection, climate change and ozone layer protection"*).

The Program, *inter alia,* proposes the National Emission Reduction Commitments for SO_2, NOx, NH_3 and $PM_{2.5}$ and VOC and thus represents the contribution of the Republic of Serbia to the improved air quality in the context of the approximation to the EU legal framework in particularly to the transposition and the implementation of the Directive 2016/2284/EU on the reduction of national emissions of certain atmospheric pollutants, amending Directive 2003/35/EC and repealing Directive 2001/81/EC, which requires Members states to reduce its emissions of air pollutants compared to 2005 a base year and to prepare national programs and adopt appropriate policies and measures in order to achieve its target for emission levels in 2030 and beyond. Furthermore, this document will allow Republic of Serbia to engage in the negotiation for ratification of the Gothenburg protocol to Abate Acidification, Eutrophication and Ground-level Ozone under the Convention on long-range Transboundary Ari pollution (hereinafter: CLRTAP).

In order to prepare the future emission reduction pathways, taking into account Serbia's national circumstances different modelling tools were used in the context of the EU IPA project - Additional Development of EU Environment Approximation for Air, Chemicals and Horizontal Acquis.
For the mentioned purposes and in order to evaluate different mitigation options, three air quality emission scenarios are developed, while the Programme determines the pathway until 2030.

While modified RAIN model was used to assess the future effects of the mitigation potential of proposed policies and measures (PaMs) and to determine national emission reduction commitments for 2030 and beyond. Those results than served as an input to CHIMERE multi-scale chemistry-transport model for atmospheric composition analysis and forecast which allows to translate future reduced emissions of air pollutants from different sectors and sources into the expected future ambient air quality.
The results regarding the ambient air quality allowed for further adjustment and indenisation of policies and measures to the level at which the modelling results show the acceptable level of air quality by 2030 and beyond.

An Action plan for the implementation of the Air Protection Programme in the Republic of Serbia for the period 2022-2030 (hereinafter: the Action Plan), that is printed together with this Programme and forms its integral part, is determining the activities for implementation of measures and achievement of goals set by the Programme. The first Action plan is prepared for the period of 5 years (from 2022 to 2026).

Development of the Programme and its Action plan was led by the Ministry of Environmental Protection (hereinafter: MOEP) with the support of EU instrument for Pre-Accession Assistance (IPA) and in a close cooperation and permanent consultations with relevant stakeholders (governmental, public, private and CSOs organizations[1]).

[1] **Error! Reference source not found.**

List of Abbreviations

Acronyms	Meaning
BC	Black carbon
BAT AELs	Best Available Techniques Associated Emission Levels
CLRTAP	Convention on Long-range transboundary air pollution
DSIP	Directive specific Implementation Plan
EEA	European environmental agency
EMEP	European Monitoring and Evaluation Programme
E-PRTR	European Pollutant Release and Transfer Register
GNFR	Gridded aggregated NFR sector data
HCBs	Hexachlorobenzene
IE	Included elsewhere
IIR	Informative Inventory Report
NEC	National emission ceiling
NH_3	Ammonia
NMVOC	Non-Methanic volatile organic compounds
NRMM	Non-road mobile machinery
PAHs	Polycyclic aromatic hydrocarbons
PaMs	Policies and measures
PCBs	Polychlorinated biphenyls
PM_{10}	particulate matter 10 micrometres or less in diameter
$PM_{2,5}$	particulate matter 2,5 micrometres or less in diameter
SEPA	Serbian Environmental Protection Agency
SO_X	Sulphur oxides
TSP	Total suspended particles
UNECE	UN Economic Commission for Europe
VOC	Volatile organic compounds
WAM	Scenario with additional measures
WEM	Scenario with existing measures

2 PLANNING AND REGULATORY FRAMEWORK OF RELEVANCE FOR THE PROGRAMME

2.1 European Union and International policy framework

EU and International policy framework have been strengthening over the last decade when negative effect of air pollution to the environment and human health have been even more scientifically substantiated and confirmed. The focus of the last decade was on small particulate matter resulting from emissions from households, cars, trucks, industrial estates and power sector. In order to address deteriorating air quality especially in the agglomerations caused by increased emissions from expanding diesel vehicle fleet and road freight transport, industry and power sector the Clean Air For Europe Programme (CAFÉ) was established to support European Commission's development of the Thematic Strategy on air pollution, the Directive on Ambient Air Quality and Cleaner Air for Europe and its Impact Assessment. On that basis EU action has focused on establishing minimum quality standards for ambient air and tackling the problems of acid rain and ground level ozone. Polluting emissions from large combustion plant and mobile sources have been reduced; fuel quality improved and environmental protection requirements integrated into the transport and energy sectors.

At the EU level both top-down emission reductions as well as bottom-up measures were implemented. The new Directive on the reduction of national emissions of certain atmospheric pollutants (2016/2284/EU) entered into force at the end of 2016.

This Directive establishes the emission reduction commitments for the Member States' anthropogenic atmospheric emissions of SO_2, NO_x, non-methane volatile organic compounds (hereinafter: NMVOC), NH_3 and fine particulate matter ($PM_{2,5}$), with a view to moving towards achieving levels of air quality that do not give rise to significant negative impacts on and risks to human health and the environment. All emission reductions are compared with year 2005. Member states shall also take the necessary measures aimed at limiting their 2025 anthropogenic emissions of SO_2, NOx, NMVOC, NH_3 and fine particulate matter. The indicative levels of those emissions shall be determined by a linear reduction trajectory established between their emission levels defined by the emission reduction commitments for 2020 and the emission levels defined by the emission reduction commitments for 2030.

Furthermore, Member States shall draw up, adopt and implement their respective national air pollution control programmes[2] in order to limit their annual anthropogenic emissions. The national air pollution control programmes should also contribute to the successful implementation of air quality plans established under Article 23 of Directive 2008/50/EC on ambient air quality and cleaner air for Europe. To that effect, Member States should take account of the need to reduce emissions, in particular of NOx and fine particulate matter, in zones and agglomerations affected by excessive air pollutant concentrations and/or in those zones and

[2] Under Article 6(10) of the Directive on the reduction of national emissions of certain atmospheric pollutants, the European Commission is required to specify the format of the programme by means of an implementing act: To this end, the Commission Implementing Decision (EU) 2018/1522 was adopted on 11 October 2018. It lays down a common format for National Air Pollution Control Programmes under Directive (EU) 2016/2284

agglomerations that contribute significantly to air pollution in other zones and agglomerations, including in neighbouring countries.

When drawing up, adopting and implementing the Programme, Member States shall:

1) assess to what extent national emission sources are likely to have an impact on air quality in their territories and neighbouring Member States using, where appropriate, data and methodologies developed by the EMEP under the Protocol to the LRTAP Convention on long-term financing of the cooperative programme for monitoring and evaluation of the long-range transmission of air pollutants in Europe;
2) take account of the need to reduce air pollutant emissions for the purpose of reaching compliance with air quality objectives in their territories and, where appropriate, in neighbouring Member States;
3) prioritise emission reduction measures for BC when taking measures to achieve their national reduction commitments for fine particulate matter;
4) ensure coherence with other relevant plans and programmes established by virtue of the requirements set out in the legislation of the Republic of Serbia or the European Union.

The directive introduces a number of new reporting requirements for Member States and require from member states to report emissions from air pollutants. These are defined in Annex I of the directive and include annual information on emissions of a number of pollutants:

1) the five main air pollutants NOx, NMVOCs, SO_2, NH_3 and $PM_{2.5}$ as well as carbon monoxide (CO);
2) in addition to $PM_{2.5}$, also PM_{10} particulate matter and, if available, BC and TSP;
3) heavy metals cadmium (Cd), lead (Pb) and mercury (Hg) and, if available, the additional heavy metals arsenic, chromium, copper, nickel, selenium and zinc);
4) persistent organic pollutants (POPs) including selected PAHs, dioxins and furans, PCBs and HCB.

In addition, Member states are also obliged to report on projections prepared in a harmonised manner with climate legal framework and gridded countries emissions.

Since in many agglomerations around the EU has issues with air quality the Legal framework also prescribed the obligatory content of the Local Air quality plans and is monitoring.

In parallel with the limitation of emission of air pollutants from sources the EU legal framework also strengthen the monitoring of ambient air through the amendments of the Directive 2008/50/EC on ambient air quality and cleaner air for Europe. This Directive defines and establish objectives for ambient air quality designed to avoid, prevent or reduce harmful effects on human health and the environment as a whole. To this end, it sets out measures for the assessment of ambient air quality in Member States on the basis of common methods and criteria as well as for obtaining information on ambient air quality in order to help combat air pollution and nuisance and to monitor long-term trends and improvements resulting from national and European Community measures and ensuring that such information is available to the public. Amendments amending several annexes of the Directive 2008/50/EC of the European Parliament and of the Council are laying down the updated rules concerning reference methods, data validation and location of sampling points for the assessment of ambient air quality. In addition, the cooperation between the Member States in reducing air pollution is increased.

Furthermore, the EU legal framework is also addressing the concentrations of heavy metals through Directive 2004/107/EC relating to arsenic, cadmium, mercury, nickel and polycyclic aromatic hydrocarbons in ambient air (known as 4th Daughter Directive). The directive objectives are to establish a target value for the concentration of arsenic, cadmium, nickel and benzo(a)pyrene in ambient air so as to avoid, prevent or reduce harmful effects of arsenic, cadmium, nickel and PAHs on human health and the environment as a whole; to ensure that ambient air quality is maintained where it is good and that it is improved in other cases, to determine common methods and criteria for the assessment of concentrations and to ensure that relevant information is available to the public.

Since the air pollutants know no borders, international coordination of air pollution policy remains indispensable. UNECE Convention on Long-range Transboundary Air Pollution (Law on Ratification of the Convention on Long-range Transboundary Air Pollution ("Official Gazette of the SFRY – International Agreements", No. 11/86), adopted as a public outcry against the detrimental impacts of Acid Rain in Europe is a cornerstone of the international efforts to reduce r key harmful pollutants in the atmosphere. Gothenburg protocol was amended in 2012. The revised Protocol is also the first binding agreement to include emission reduction commitments for fine particulate matter. The Gothenburg Protocol also introduced some flexibilities to facilitate accession of new Parties, mainly countries in Eastern and South-Eastern Europe, the Caucasus and Central Asia.

Amendment sets out new national emission reduction commitments for 2020 onwards. In particular, the amendment includes: emission reductions for BC, an update of the emission limit values set in the annex to the protocol and new standards on the content of NMVOCs in products. Furthermore, the amendments require each party to apply the limit values for the fuels and new mobile sources (introduction of EURO5 and EURO6 for passenger cars and EUROV and EURO VI for heavy duty vehicles, and emission standard for other modes of transport such as motorcycles and mopeds, locomotives, railcars, waterway weasels, recreational crafts and non-road machinery (hereinafter: NRMM)).

2.2 National policy framework

The main building block of the national policy framework regarding the air quality is the Law on Air protection ("Official Gazette of the Republic of Serbia", Nos. 36/09, 10/13 and 26/21-as amended). This Law regulates and the relevant bylaws regulate air quality management and determines the measures, method of organization and control of the implementation of protection and improvement of air quality as a natural value of general interest that deserves special protection.

It controlling of the air quality is conducted through identifications of zones and agglomerations and prescribed actions for the assessment of the air quality in such zones and agglomerations for the selected air pollutants. This law also provides legal background for the air quality monitoring system at the state and local level and defines responsibilities for the institutions involved. Furthermore, it defines and specifies requirements for air quality, air quality categories, timelines

for exceedance and exceptions and provide for procedures for informing the public in the event of threshold exceedance. In addition, the law also defines pollutions form natural sources and exceedances because of road sanding or salting.
Special chapter in the law is dedicated to Instruments of National Policy and planning namely: Air Protection Programme, Air Quality Plans, Short-term action plans, National programme for gradual decrease of annual national emission ceilings of the pollutants, National plan for decreasing the emissions from the existing combustion installations and Operator's plans for decreasing emissions from stationery installations, for which the Law prescribes relevant content.

In addition, a chapter on Measures for Air quality improvements defines measures for preventing and decreasing the air pollution from stationary sources, Emission of volatile organic compounds, proposal of national emission ceilings (hereinafter: NEC), prescribing the allowed amounts of individual pollutants in specific products (in fossil fuels and in paints and polishes), gradual decrease of the use of substances that deplete the ozone layer and other measures for pollution preventing and decreasing.
The law is also regulating the matters of measurement the emissions and level of the pollutants in the air and issues relating to the Informing and reporting and on the content of the air quality information system and funding the protection and improvement of the air quality. Funds for financing protection and improvement of air quality shall be provided from the budget of the Republic of Serbia and through the operator's obligations pursuant to the Law on Air Protection.

On the basis of this Law multiple by-laws are for the purpose of management and improvement of the ambient air quality in detail defining zones and agglomerations[3], defining the categories of air quality in zones and agglomerations.

Furthermore, the Regulation on monitoring conditions and air quality requirements ("Official Gazette of the Republic of Serbia", No. 11/10, 75/10 and 63/13) determines criteria for determining the minimum number of measuring points and locations for sampling in the case of fixed measurements and in the case when fixed measurements are supplemented by indicative measurements or modelling procedures; air quality measurement and assessment methodology (reference measurement methods and concentration assessment criteria); data requirements used to assess air quality; method of data quality assurance for air quality assessment (according to the requirements of SRPS ISO / IEC 17025); scope and content of information on air quality assessment in accordance with the Law on Air Protection. In addition, the regulation also sets air quality requirements such as limit values for the level of pollutants in the air; upper and lower limits for assessing the levels of air pollutants; tolerance limits and tolerance values; concentrations hazardous to human health and concentrations reported to the public; critical levels of air pollutants; target values and (national) long-term targets for air pollutants and deadlines for reaching the limit and / or target values, in cases when they are exceeded. In order to achieve the established limit values or target values and deadline and to harmonise the approach the Rulebook on the Air Quality Plans ("Official Gazette of the Republic

[3] The Republic of Serbia has three zones: Srbija, Vojvodina and zone Kosovo and Metohija and eight agglomerations: Belgrade, Novi Sad, Niš, Bor, Užice, Kosjerić, Smederevo and Pančevo

of Serbia", No. 21/10) and the Rulebook on the content of short-term air quality plans ("Official Gazette of the Republic of Serbia", No. 65/10) which in more detail the content of air quality plans and short-term action plans adopted by the competent authorities of the Autonomous Province and / or the competent authority of the local self-government units. Responsible body of the autonomous province and the responsible body of an LSG unit to prepare the Air Quality Plan in zones and agglomerations at their territory where the air quality is in the 3rd category. By the end of 2020 there were Air quality plans prepared for Belgrade, Bor, Novi Sad, Pančevo, Smederevo , Užice and Kragujevac.

Where, in a given zone or agglomeration, there is a risk that the levels of one or more pollutants will exceed concentrations dangerous to human health, the Responsible body of the autonomous province and the responsible body of an LSG unit shall draw up short-term action plans indicating the measures to be taken in the short term in order to reduce the risk or duration of such an exceedance. Short term action plans and information on the manner of their implementation must be available for the public and interested organisations. Such plans are prepared for Užice, Sombor and Bor , Sremska Mitrovica, Kragujevac and Leskovac got approval from the MoEP in 2021, while short term actions are for Belgrade included in the updated air quality plan.

In order to ensure the appropriate level of the air quality measurement within the state network the governments passed the Regulation on determining the Air Quality Control Program in the state network ("Official Gazette of the Republic of Serbia", No. 58/11). Also, the Rulebook on conditions for issuing a license for measuring air quality and a license for measuring emissions from stationary pollution sources ("Official Gazette of the Republic of Serbia", No. 1/12) was adopted and it prescribes detailed conditions for issuing permits for measuring air quality and permits for measuring emissions from stationary sources of pollution, as well as conditions to be met by a legal entity established by the competent authority of the Autonomous Province, i.e. the competent authority of the local self-government unit, to conduct the air quality monitoring, monitor the operation of automatic stations, and to collect and process data obtained by air quality control in the local network.

Since the information on air quality received from the national and local network is essential for the proper assessment of the ambient air quality in the Republic of Serbia a Rulebook on the manner of exchange of information on measuring points in the state and local network, measurement techniques, as well as on the manner of exchange of data obtained by monitoring air quality in the state and local networks ("Official Gazette of the Republic of Serbia", No. 84/10) was adopted in order to enable the reporting and its content to be conducted in electronic manner, ensuring the integrity of the Air quality Information system which is an integral part of the unique environmental protection information system.

Also, the Annual Progress Report of the European Commission, for 2021, regarding Chapter 27 – Environment and climate change, the key recommendation was for Serbia to adopt the EU air quality index, in order to achieve harmonization with the index used by the European Environmental Protection Agency.

In view of the expected volume of work, the lack of staff and the fact that capacity would have to be built up gradually over time, support from external experts would be important as well as long-term partnerships with scientific institutes which would provide external support.

Sectoral air quality related legislation

Energy and Manufacturing industries

When it comes to sectoral legislation and programmes that significantly contribute to the general objective of the Law on air protection it has to be noted that the Regulation on limit values of emissions of pollutants into the air from combustion plants ("Official Gazette of RS", No. 6/16 and 67/21) has been adopted on the basis of the Law on air protection. This regulation prescribes: limit values for the emission of pollutants into the air from a combustion plant; methods and deadlines for submission of data; the procedure for determining the total annual emission from the combustion plant. Provisions of this Regulation shall apply to combustion plants, which can be large, medium and small combustion plants. Emissions of air pollutants from combustion plants shall be determined by measuring and/or calculating the emission parameters based on measurement results.

On the basis of provisions of this regulation the Government, as part of its obligation as contracting Party of the Energy Community, adopted NERP. The implementation of the NERP will by 2027 result in significant reduction[4] of air pollutants from the combustion in old large combustion plants[5], since all the existing old large plants will by 2027 comply with limit values for emissions of air pollutants.

Furthermore, the Law on Integrated Pollution Prevention and Control (IPPC) ("Official Gazette of the Republic of Serbia", No. 135/04, 25/15 and 109/21) which was adopted in December 2004 and amended in March 2015 and November 2021 lays down the conditions and procedure for issuing an integrated permit for plants and activities that may have negative impacts on human health, the environment or material goods, types of activities and plants, supervision and other issues of importance for preventing and controlling environmental pollution. According to the preliminary list of existing facilities created on the basis of the Regulation on types of activities and facilities that require issuance of the integrated permit ("Official Gazette of the RS", No 84/05), there are 227 facilities in the Republic of Serbia covered by the Law however only 39 integrated permits were issued by the end of 2020. The Law on Integrated Prevention and Control of Environmental Pollution sets for division of competencies regarding the issuing the integrated permits (national level, provincial level and local level)

The law sets for numerous by-laws, among others also the Decree on criteria for determination of best available techniques, for implementation of quality standards, as well as for determination of emission limit values in the integrated permit - (Official Gazette of the RS, No. 84/05)[6] and decree on the content of the measures for bringing of the existing installation or activities in compliance with the provisions of the Law on IPPC (Official Gazette of the RS, No. 84/05) - description of: the measures for bringing of the installation in compliance with the

[4] It is expected that SO_2 emissions will be in 2027 at the national level be reduced for 84%, NOx for 34% and for particulate matters for 1% compared to 2015

[5] NERP applies for old large combustion plants with a total rated thermal input equal to or greater than 50 MW

[6] Recast of Annexes III and IV of the IPPC Directive, including in addition requirements referring to environmental quality standards and emission limit values

provisions prescribed by the Law on IPPC, the time schedule of the planned measures together with the commencement and termination of the measures, the expected results, monitoring (control) of the measures, expected coasts of the measures.

In addition to the secondary legislation mentioned above additional by-laws are adopted defining, inter alia, Regulation on the type of activities and installations that the integrated permit shall be granted for, the Rulebook on the content, appearance and method of filling in the application for granting of the integrated permit ("Official Gazette of the RS", No. 30/06, 32/16 and 44/18 – other law), the Rulebook on the content and appearance of integrated permit ("Official Gazette of the RS No. 30/06).

Furthermore, Regulation on limit values of emissions of air pollutants from stationary pollution sources[7], excluding combustion plants *("Official Gazette of the RS", no. 111/15 and* 83/21*)*[8] *prescribes* limit values for the emission of pollutants into the air from stationary sources of pollution, except for combustion plants; the content of the emission balance report and method of submission of emission data for the purposes of the information system and deadlines for data submission. Measurement of pollutant emissions in the air from stationary sources of pollution shall be carried out in accordance with the provisions of the regulations governing the measurement of pollutant emissions into the air from stationary sources of pollution. For new and existing stationary sources of pollution emission limit values shall apply as of the date of entry into force of this Regulation; Emissions from the existing stationary sources must comply with the emission limit values for new stationary sources of pollution within a period of five years as from the date of entry into force of this Regulation (from 6.1.2016). For the existing stationary sources of pollution that are subject to integrated permitting the deadlines for attainment of the limit values for air pollutants shall apply until the issuing of the integrated permit.

Transport sector

In Republic of Serbia, in the field of motor vehicles in general, standards are prescribed by the Rulebook on division of motor vehicles and towed vehicles, and technical requirements for vehicles in road traffic ("Official Gazette of RS", 40/12, 102/12, 19/13, 41/13, 102/14, 41/15, 78/15, 111/15, 14/16, 108/16, 7/17, 63/17, 45/18, 70/18, 95/18, 104/18, 93/19, 2/20 – correction, 64/21, 129/21 – other rulebook and 110/22 – other rulebook). The abovementioned rulebook prescribes different requirements for domestically produced and imported new vehicles with regard to the exhaust gases since for busses and heavy-duty vehicles[9] produced in the Republic of Serbia at least EURO 4[10] for and at least EURO 5 standards are required if

[7] Stationary sources of pollution, in the context of this Regulation, are industrial plants, technological processes, certain activities and devices from which pollutants are released into the air.

[8] The provisions of this regulation do not apply to thermal waste treatment processes. The provisions of this Regulation shall not apply to activities and installations using volatile organic compounds.

[9] Heavy-duty vehicles are defined in accordance with the Rulebook on the Division of Motor Vehicles and Trailers and Technical Conditions for Road Vehicles and are classified as N1, N2 and N3.

[10] In the European Union, emissions of nitrogen oxides (NOx), total hydrocarbon (THC), non-methane hydrocarbons (NMHC), carbon monoxide (CO) and particulate matter (PM) are regulated for most vehicle types, including cars, trucks (lorries), locomotives, tractors and similar machinery, barges, but excluding seagoing ships and aero planes. For each vehicle type, different standards apply. Compliance is determined by running the engine at a standardized test cycle.

busses are assembled in the Republic of Serbia. For used imported vehicles at least EURO 3[11] standard is required.

Households

Emission limit values from households are regulated through provisions of the Regulation on limit values of emissions of pollutants into the air from combustion plants relevant for small combustion plants which are plants that produce thermal energy for heating households and sanitary water for households and whose thermal input is less than 1 MW_{th} when using solid fuels, 5 MW_{th} when using liquid fuels and 10 MW_{th} when using gaseous fuels. However, it has to be noted that operational monitoring of emissions of air pollutants from small combustion plans is not defined or stablished.

While Eco-design which is in the EU regulating environmental characteristics of more than 20 sets of products and among these, there are two EU regulations impacting solid fuel boilers and solid fuel local space heaters in domestic heating which are of high interest for reducing emissions of suspended particles from small domestic heating appliances using biomass or fossil solid fuels, for which transposition is according to NPAA[12] planned for after December 2021, or rather, after the accession to the EU, when delegated regulations will apply directly.

Agriculture sector

Since agriculture is a predominant source of NH_3 emissions, emission form agriculture is to some extent regulated through law on Law on integrated Pollution Prevention and Control which regulates emission from installations for the intensive rearing of poultry and pigs that require integrated permit (91 of such installations in the Republic of Serbia).

One of the important segments of NH_3 the emissions is also nitrogen fertilisers which are applied to arable agricultural land. Those emissions are indirectly regulated through the Law on Water ("Official Gazette of the RS", No. 30/10, 93/12, 101/16 and 95/18 – other law).

The Republic Water Directorate, a body within the Ministry of Agriculture, Forestry and Water Management, is responsible for determining Nutrient Vulnerable Zones and their boundaries, proposing Action Programmes with mandatory measures for protected areas designated as vulnerable zones, proposing good agricultural practice, in order to achieve a general level of protection of water against pollution by nitrates from agricultural sources of all water bodies, surface and groundwater. The Code of Good Agricultural Practice (CGAP)[13] was drafted in 2016, but has not been adopted so far.

<u>Horizontal legislation to reduce air pollution</u>

[11] For all new registration of vehicles in the EU EURO 3 standard enters into force in January 2001.

[12] National Programme for adoption of the acquis – 3rd revision, February 2018

[13] The draft Code of Good Agricultural Practice (CGAP) has been developed, through implementation of project: "Preparations for negotiations related to Serbia's EU accession process, Phase 2, Environment Accession Project (ENVAP 2) - Designation of Sensitive Areas and Vulnerable Zones According to the EU Nitrates and Urban Wastewater Treatment Directives (ENVAP 2 Project 2014-2016)".

Emissions of some pollutants (such as SO_2 and VOC) are due to their nature best regulated through quality of fuel or the content pollutant released from the production process, product or material.

Therefore, SO_2 emissions from liquid fuels are best regulated through limitation of Sulphur content in fuels. While Sulphur content in solid fuels is not regulated, Sulphur content in liquid fuels is regulated through the Rulebook on Technical and Other Requirements for Liquid Fuels of Petroleum Origin ("Official Gazette of the RS" No. 150/20, 127/21 and 129/22) which prescribes technical and other requirements that must be met by liquid fuels of petroleum origin used as fuels for internal combustion engines and as energy fuels placed on the market of the Republic of Serbia, as well as method of assessing the conformity of liquid fuels. Sulphur content in heavy fuel oil is from 1. January 2021 reduced from 3% to a maximum of 1%, in gas oil, Sulphur content is set at 0,1% and in Euro diesel at as low as 10 parts per million (ppm).

For reduction of VOC emissions, (taking into account the nature of the emissions where emissions are not necessary caused by combustion of fuel and/or material but rather from evaporation) a specific set of legal frameworks is being set in place such as:

Regulation on the list of industrial installations and activities in which volatile organic compounds emissions are controlled , values of emission of volatile organic compounds under specific consumption of solvents and total permissible emissions, as well as emission reduction scheme ("Official gazette of RS" No 100/11) which provides for a list of industrial installations and activities in which volatile organic compounds emissions are controlled, the emission values of volatile organic compounds at a given solvent consumption, and the total permissible emissions of volatile organic compounds from installations and activities, as well as schemes for reducing emissions of volatile organic compounds.

Furthermore, emissions of volatile organic compounds where source of emissions is transportation, storage and distribution of motor fuels are regulated by the Law on Air Protection and by the Rulebook on technical measures and requirements in relation to allowed emission factors for VOCs resulting from the storage and transport of petrol ("Official gazette of RS", No. 1/12, 25/12, 48/12 and 96/19) which lays down technical measures and requirements pertaining to the permitted emission factors for VOCs originating from the process of storage and transport of petrol, that is, for storage, loading and unloading installations at terminals and for mobile tanks, loading and unloading installations in retail objects.

Since certain paints, varnishes and vehicle refinishing products are significant sources of volatile organic compounds, emissions from those sources are regulate through Law on Chemicals ("Official Gazette of Republic of Serbia", No. 36/09, 88/10, 92/11, 93/12 and 25/15) and Rulebook on Bans and Restrictions of Production, placing on the Market and Use of Chemicals ("Official Gazette of the Republic of Serbia", No. 90/13, 25/15, 2/16, 44/17, 36/18, 9/20 and 57/22) which prescribes restrictions and prohibitions[14] on the production, placing on the

[14] Restrictions and prohibitions referred to certain dangerous substances, mixtures or products; long-lasting organic pollutants; the total content of volatile organic compounds in certain coatings (paints and varnishes) applied to buildings, their equipment and fittings, as well as in certain means and coatings for repair of road vehicles or their parts during repair, conservation or decoration outside production facilities

market and use of chemicals, prohibited or permitted uses, as well as other conditions for the production, placing on the market and use of substances, mixtures or products unacceptable risk to human health and the environment.

Ozone Depleting Substances (HCFCs) and Fluorinated Greenhouse Gases (HFCs)

The Republic of Serbia ratified the Montreal Protocol on ozone depleting substances (Law on ratification of the Montreal Protocol on ozone depleting substances ("Official Gazette of the SFRY – International Agreements", No. 16/90 and the "Official Gazette of Serbia and Montenegro – International Agreements", No. 24/04 – other law), as well as all amendments to the Protocol, after which it undertook certain obligations related to the control of production and consumption of ozone depleting substances and fluorinated greenhouse gases.

In the Republic of Serbia, the production of ozone-depleting substances is prohibited, as well as the consumption of a certain group of these substances:

CFCs, halons (except for critical use), carbon tetrachloride, methyl chloroform, methyl bromide.

Imports are allowed only for one group of these substances, i.e. chlorofluorocarbons (hereinafter: HCFCs), which is strictly controlled through the licensing system and annual quotas.

In accordance with clearly defined time schedule, the Republic of Serbia, as a country under Article 5 of the Montreal Protocol, has been implementing measures to reduce consumption of HCFC substances, starting in 2013, when the baseline level (base consumption) of 8.37 ODP (ozone depleting potential) tons was set. After that, in 2020, the goal was achieved by reducing the consumption of HCFCs by more than 35% compared to the baseline level. The next goal and commitment of the Republic of Serbia is to reduce the consumption of HCFCs by 67.5% compared to the baseline level by 2025, followed by the complete phase out of these substances from use in 2030.

When it comes to HFCs, i.e. fluorinated greenhouse gases, the first measure and commitment is to determine the base consumption of these substances in 2024, based on average consumption in 2020, 2021 and 2022, followed by a reduction in consumption of these substances according to clearly defined time schedule:

1) by 10% compared to the baseline level in 2029,
2) by 30% compared to the baseline level in 2035.

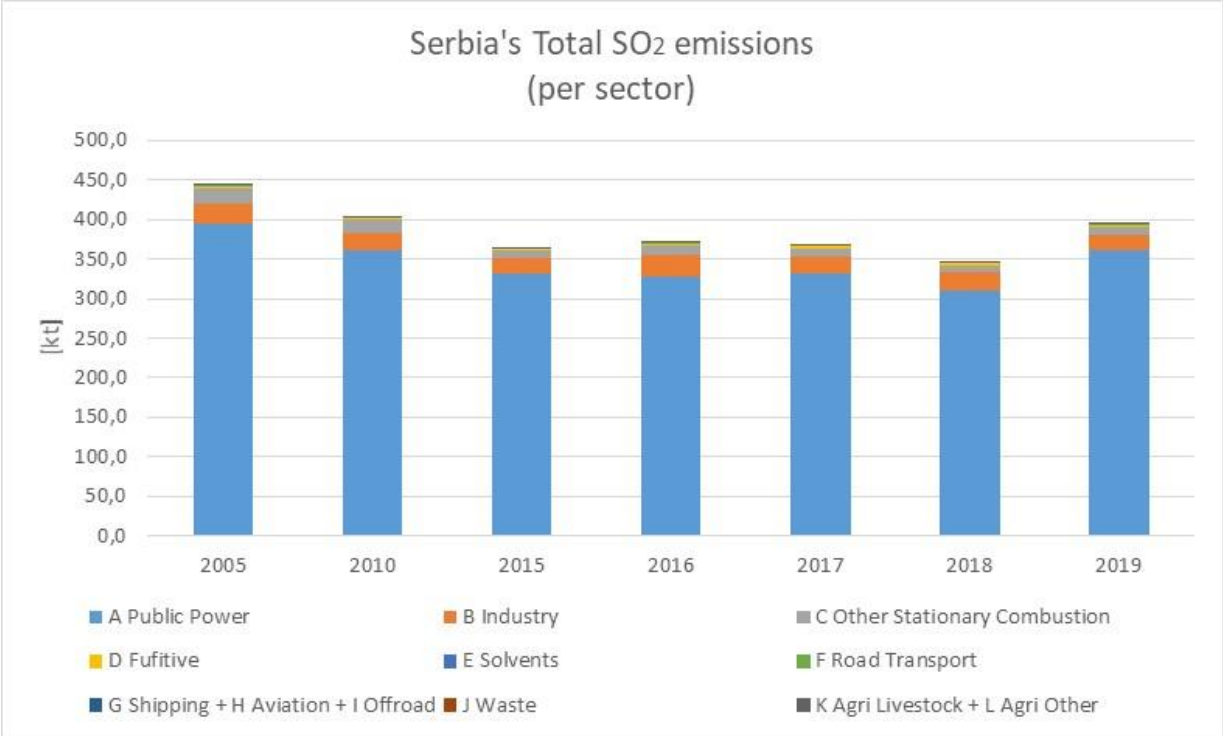
The list of the legal framework needed for full implementation of this Programme independently of the EU legislation transposition, is provided in Annex 2 – Information on the legal framework to be adopted or amended and supplemented, which is printed along with this Programme and forms its integral part.

3 CURRENT SITUATION REGARDING AIR QUALITY

3.1 Historical emissions of air pollutants

Total emissions of SO_2 in 2019 amounted to 395,4 kt SO_2, which represents 8,6% increase of emissions compared to the year 2015 and decreased for 11,2% compared to 2005. (Figure 1).

Figure 1 : Total SO_2 emissions in the Republic of Serbia (2005-2019)

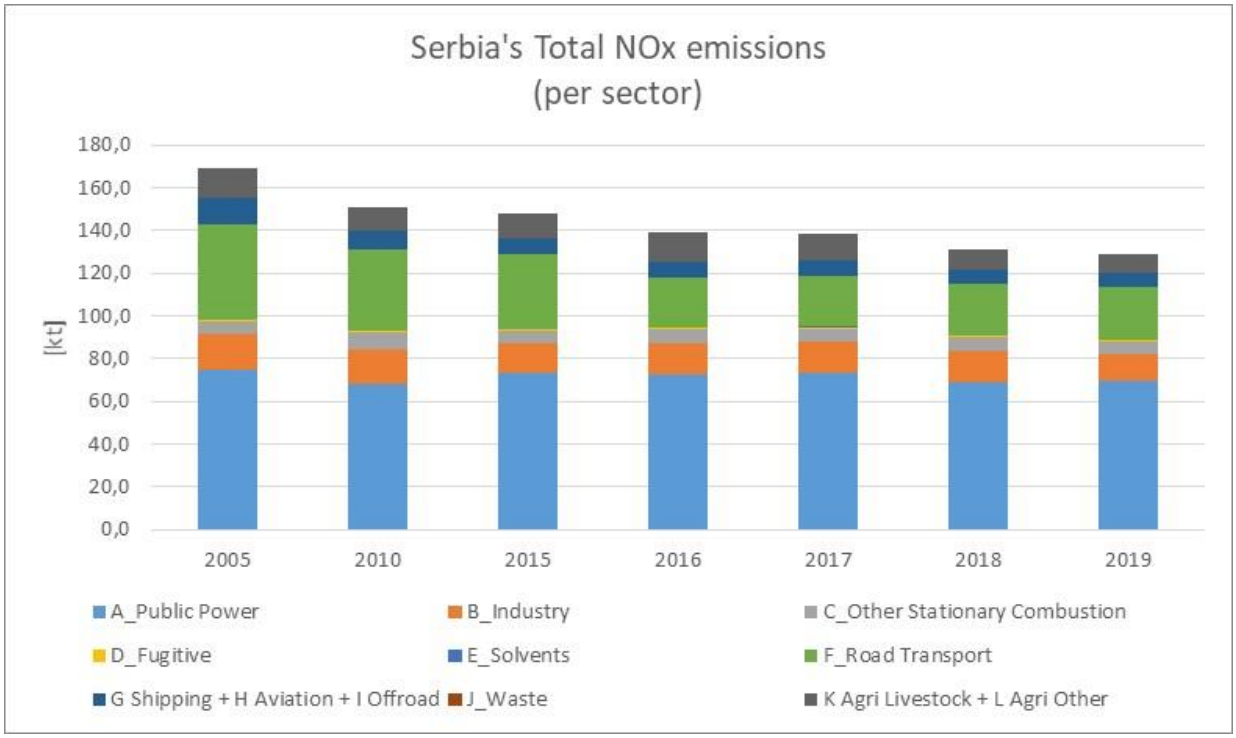


Public electricity and heat production is by far the biggest source of SO_2 emissions accounting for 91,5% of the overall emissions. SO_2 emissions are driven by the consumption of domestic lignite in thermo-power plants and the sulphur content of the domestic lignite. It has to be noted that according to NERP emissions in 2018 and 2019 should already be significantly lower; in 2018 and 2019 54,6 kt instead of 310,3 kt and 361,8 kt respectively.

The remaining 4,9% of the SO_2 emissions is coming from Industry, predominantly from lignite (66%) followed by heavy fuel oil (33%) the remaining SO_2 emission in industry are coming from other fuels.

Total emissions of NOx in 2019 amounted to 128,9 kt NOx, which represents 13,0% decrease of emissions compared to the year 2015 and 23,8% compared to 2005. Total emissions are in having a steady declining trend driven by reduction of emissions in transport sector (29.6% reduction compared to 2015) and to some extent form industry (7,9% reduction compared to 2015) (Figure 2).

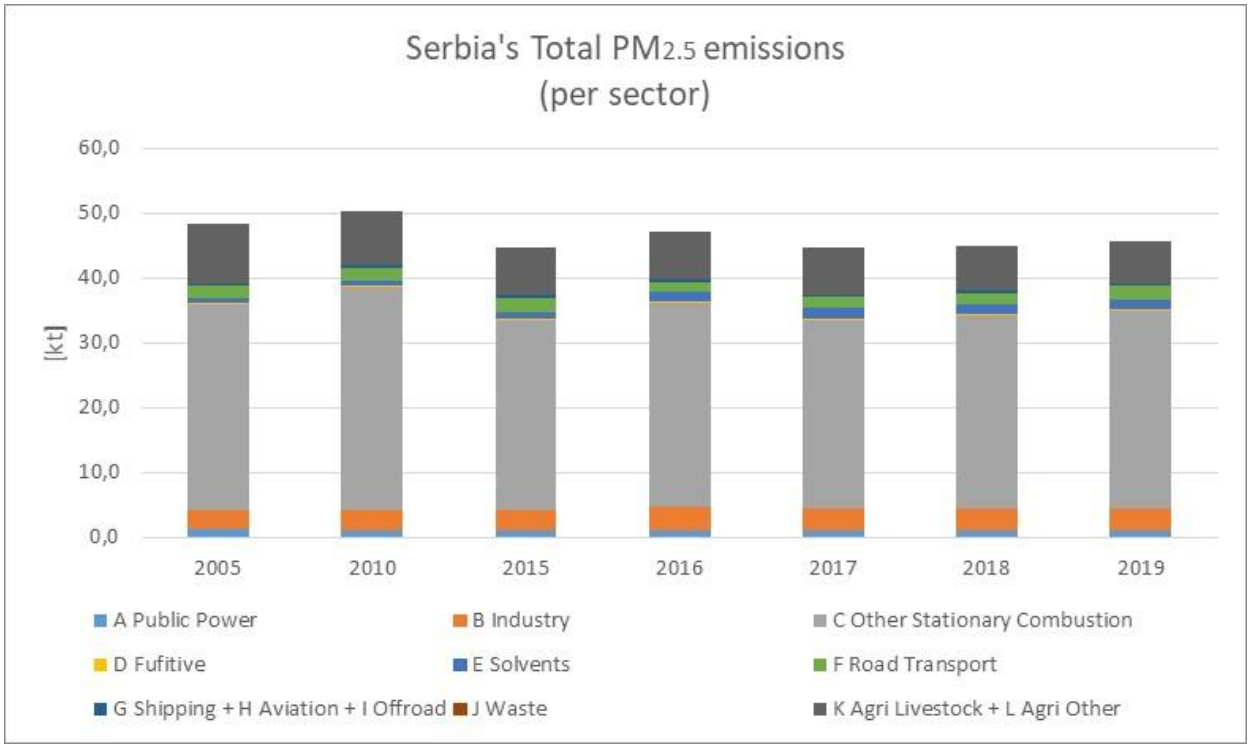
Figure 2 : Total NOx emissions in the Republic of Serbia (2005-2019)



When it comes to NOx emissions in the Republic of Serbia, Public Electricity and Heat production is with 53,8% share a predominant source of emissions. The share is increasing since 2015 when it was 49,5%. Transport sector is with 19,2% the next significant source of emissions, however the share of transport sector is since 2015 decreasing, due to renewal of vehicle fleet with better emission standards, despite the increase in road fuel consumption. Within the Road Transport sector 52,8% of NOx emissions from are accounted for heavy duty vehicles and busses, 36,3% for passenger cars and 10,9% for light duty vehicles. It has to be noted that since 2016 NOx emission from road transport have an increasing trend.

Emissions of $PM_{2.5}$ in 2019 amounted to 45,6 kt $PM_{2.5}$ which represents 2,3% increase since 2015 and 5,7% decrease since 2005. Total $PM_{2,5}$ Emission have an increasing trend since 2015. Predominant source of emission of $PM_{2.5}$ is Other stationary combustion with 67.4% of emissions (where emission of $PM_{2.5}$ from biomass and lignite burning in households represents 99.3% of $PM_{2.5}$ emissions), followed by Agriculture waste burning (field burning) with 14,2% and Industry with 7,3%. (Figure 3). The increasing trend of emissions since 2016 is driven by Road Transportation sector where emission of PM2.5 have since 2016 increased for as much as 23,7% driven by increase in diesel fuel sales and on increased old diesel vehicle fleet in the Republic of Serbia. Due to increased total mileage driven by cars vans and heavy-duty vehicles $PM_{2.5}$ emissions from tyre and break wear is also steadily increasing (since 2005 those emissions are increasing in average for 4,6% a year and between 2005 and 2019 therefore increased for as much as 187,5%).

Figure 3 : Total $PM_{2.5}$ emissions in the Republic of Serbia (2005-2019)



$PM_{2.5}$ Emission from households' biomass burning show no significant improvement since 2005, which reflects poor technology improvement regarding the biomass and other solid fuels burning, which can be attributed also to the lack of relevant legislation stimulating producers of biomass boilers, cookers and other appliances using solid fuels to improve emission performance through improved design of their products dedicated to domestic market.

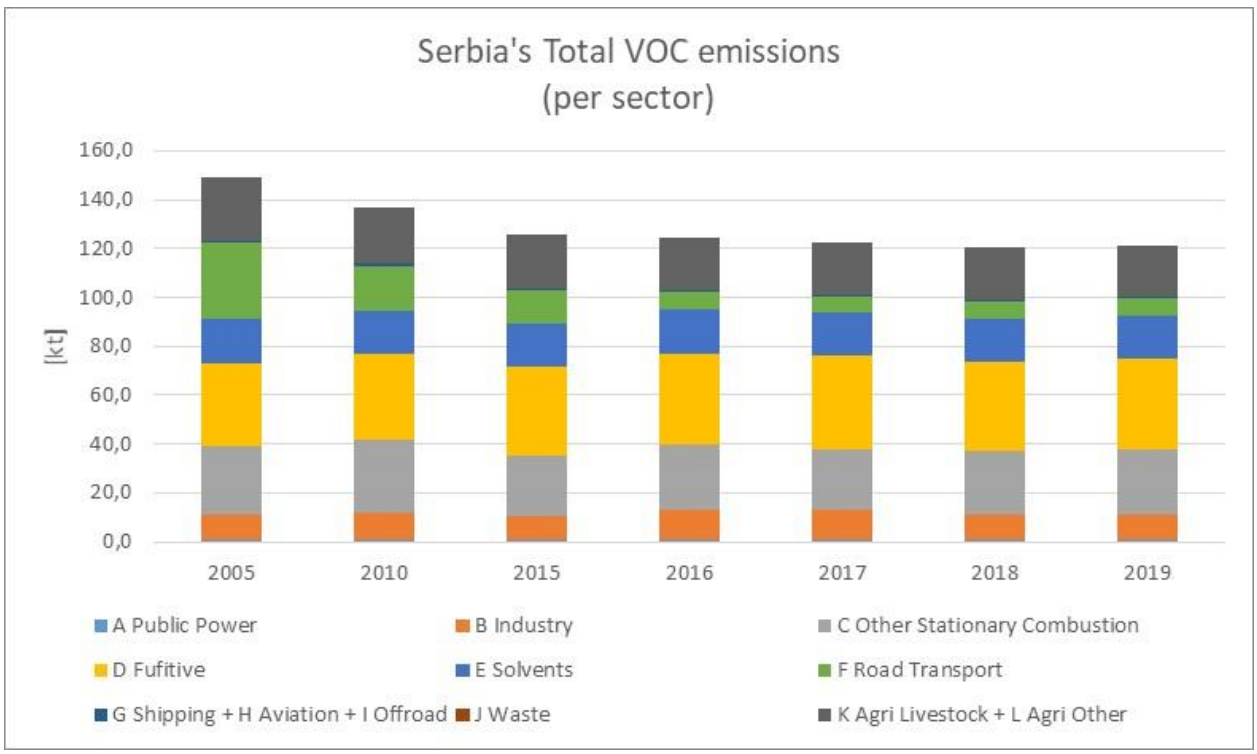
Furthermore, it has to be noted that Agriculture field burning is also one of the significant contributors to the $PM_{2,5}$ emissions in particularly since those emissions are concentrated to the period of few months. It has to be noted that field burning in the Republic of Serbia is occurring despite being formally banned by both Fire Protection Act ("Official Gazette of the Republic of Serbia", No. 111/09, 20/15, 87/18 and 87/18 – other law) and Law on Agriculture land ("Official Gazette of the Republic of Serbia", No. 62/06, 65/08 – other law, 41/09, 112/15, 80/17 and 95/18 – other law).

The PM2.5 emissions contained in the national CRLTAP inventory are primary PM2.5 emissions. It should be noted that in addition to primary PM2.5, ambient air also contains secondary PM2.5. Secondary formation occurs due to complex photochemical reactions in the atmosphere. Therefore, the values detected by the ambient air monitoring system represent both primary and secondary PM2.5. The main precursors/components for the secondary formation of PM2.5 are SO2, NOx, VOC and NH3. For example, SO2 in ambient air can be oxidized by oxidants such as ozone and hydroxyl radical (OH) in H2SO4 and almost all H2SO4 gas may be a result of its low vapour pressure of ambient air which is converted from gaseous phase to particulate phase because H2SO4 further reacts with NH3 to form sulphate salts (NH4)2SO4, which are thermally stable. Therefore, any reduction in CO2 emissions will, in addition to primary reductions in PM2,5 (triggered by applied desulphurisation technology), be reflected in a reduction in secondary PM2,5, and the combined effect will be detected by the ambient air quality monitoring network. A similar process applies to NOx emissions that result in the formation of nitrate salts which are not thermally stable and may decompose under specific atmospheric conditions.

VOC emissions in Serbia in 2019 amounted for 121.3 kt VOC, which represents 18,8% decrease compared to 2005 and 3,6% decrease compared to 2015. Most notable VOC emission reduction is observed in the road transportation sector where VOC emissions compared to 2005 decreased for 77,2% and compared to 2015 for 49,7%, mainly due to environmental improvements of gasoline powered passenger cars and vans. VOC emissions in Fugitive sector[15] which represents 30,8% of all emissions have since 2015 increased for 3,2% mainly due to increase in Fugitive emission from solid fuels: Coal mining and handling (+1,9%) and increase in distribution of oil products (+11,9%).

VOC emissions in Fugitive sector is followed by Other Stationary Combustion (with biomass burning in households) with 21,9% of overall VOC emissions. Since 2015 VOC emissions from this sector have been increased for 6,5%, mainly due to the increase of biomass burning in households.

Figure 4: Total VOC emissions in the Republic of Serbia (2005-2019)



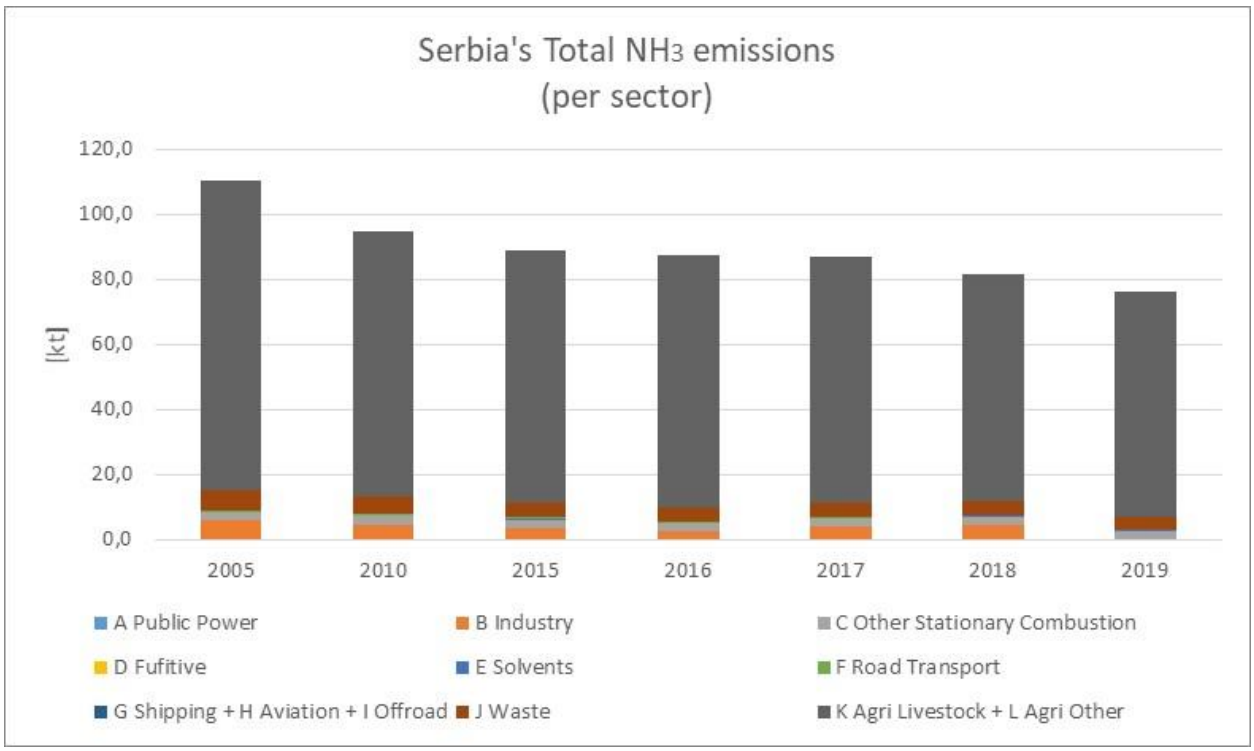
VOC emission from Agriculture account for 17,5% and have decreased for 3,7% since 2015. The main source of VOC emissions from Agriculture sector remains manure management with 83,3% and VOC from Cultivated crops account for 14,1% and filed burning for 2,6% of overall VOC emissions. Within the manure management VOC form of dairy cattle accounts for 42,8%, from non-dairy cattle for 23,9%, from swine 12,2% and 21,2% for other animals such as sheep, goats, laying hens and broilers.

Ammonia emissions in the Republic of Serbia in 2019 amount to 76,1 kt NH_3 which since 2005 represents a decrease of emissions for since 2005 for 31,2% and since 2015 a decrease for 14,5%. Predominant driver for trends of NH_3 emissions is agriculture sector which represents 90,7% of

[15] Includes Fugitive emission from solid fuels (Coal mining and handling, transformation) and fugitive emissions from Oil and Gas (exploration, production, processing, transmission, storage, distribution and other such as venting and flaring)

all national totals. The remaining 9,3 % accounts for waste sector 5,1% and Industry 3,4% and all other sectors 0,7%. The main source activity for NH_3 production is manure management which account for 85,5% of agriculture emissions, 10,6% accounts for emission from Innorganic N-feltilizer (including urea applications), remaining 3,8% of ammonia emissions are coming from field burning. The declining trend in ammonia emissions is driven mainly driven by reduced activities in pigs breeding in in the Republic of Serbia.

Figure 5: Total NH_3 emissions in the Republic of Serbia (2005-2019)



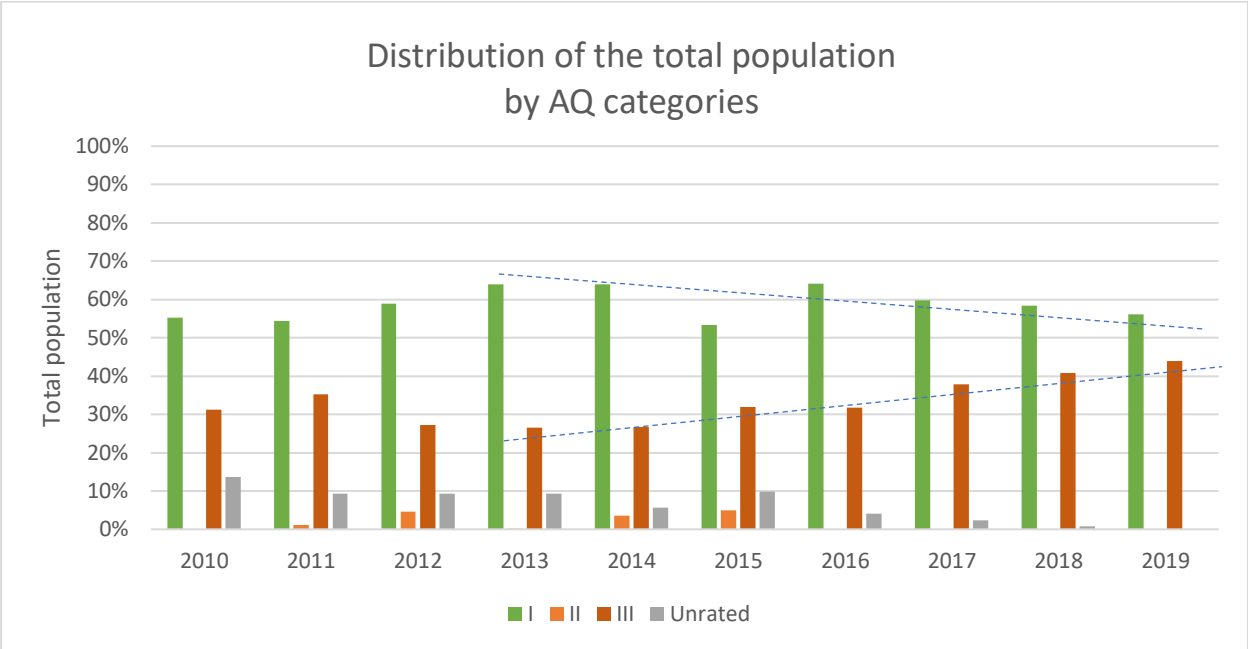
Furthermore, it can be noted that NH_3 emissions in Industry in 2019 decreased significantly. The reduction of NH_3 emissions is due to stoppage of production of ammonium nitrate due to non-compliance with environmental legislation and market conditions.

3.2 Historical situation regarding the Air quality in zone and agglomerations in the Republic of Serbia

Automatic and systematic air quality monitoring in Serbia is dated back to 2002 where first automatic monitoring in the Republic of Serbia started in Pančevo municipality and Belgrade PHI in 2002. Shortly after establishment of SEPA, in 2006 SEPA monitoring stations were installed and put into operation. The state network for automatic air quality monitoring in the Republic of Serbia operated by SEPA was expanding and was completed in 2009-2010 through an EU project. In parallel awareness of the availability of the information on air quality grow also at the local communities and agglomerations. By the end of 2020 state network has [34] locations. Different locations measure different air quality parameters such as SO_2, NO_2, PM_{10}, $PM_{2.5}$, O_3, CO, BTX (benzene, toluene, xylene), different heavy metals and PAHs. In 2019 air quality monitoring

network with fixed measurements cover 47,6% of total populations. Air quality in the Republic of Serbia is classified in three categories. Air quality Category I is ambient air which is pure or slightly polluted air where the limit values of none of the pollutants are exceeded. While Category II is for moderately polluted air where limit values of one or more pollutants are exceeded, but tolerant[16] values of none of the pollutants are not exceeded, Category III describes for ambient air which is too polluted and where tolerant values for one or more pollutants are exceeded.
In the Republic of Serbia the number of inhabitants exposed to poor air quality is increasing since 2013 (Figure 6)

Figure 6 : Distribution of total population of the Republic of Serbia by air quality categories (2010-2019)

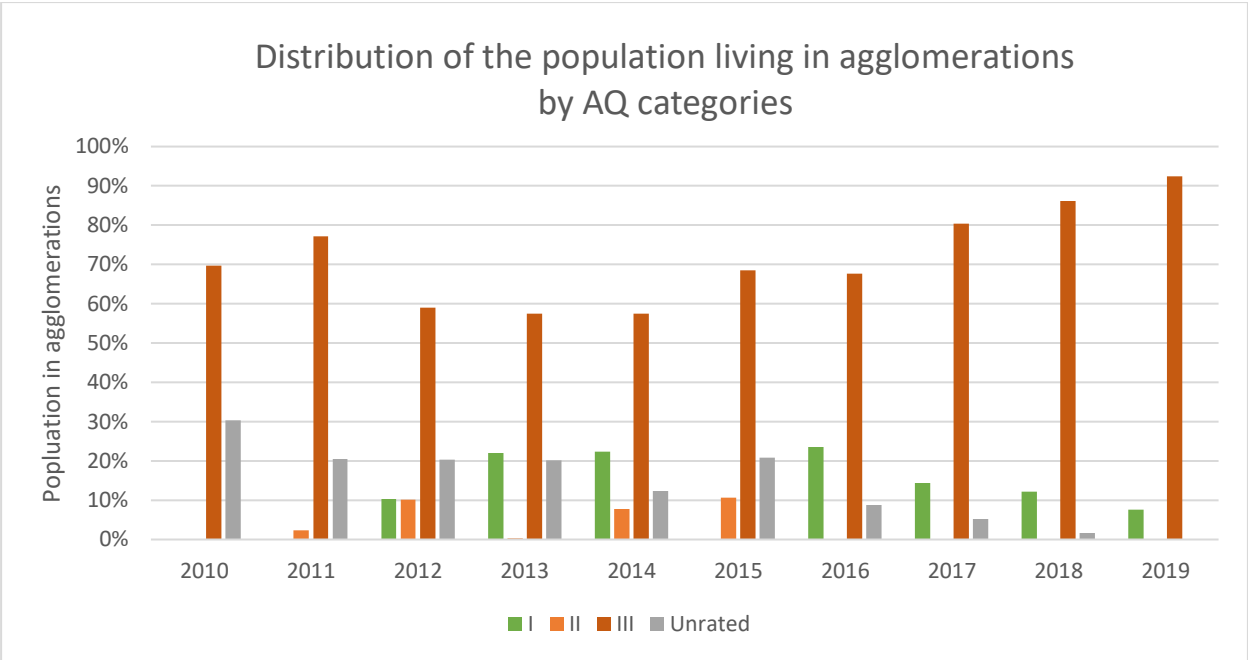


The number of cities in Zone of Serbia and Vojvodina and agglomerations with poor air quality is increasing since 2013 when 26,7% of all the populations lived in cities and agglomerations with category III air quality, while in 2019 this number has increased to 44%. When observing only

[16] In event of a pollutant not having a prescribed tolerance limit, its limit value shall be taken as the tolerant one

agglomerations and cities with AQ measurements in zone Serbia and zone Vojvodina it can be observed that air quality is deteriorating.

Figure 7 : Distribution of the population living in agglomerations[17] by air quality categories (2010-2019)

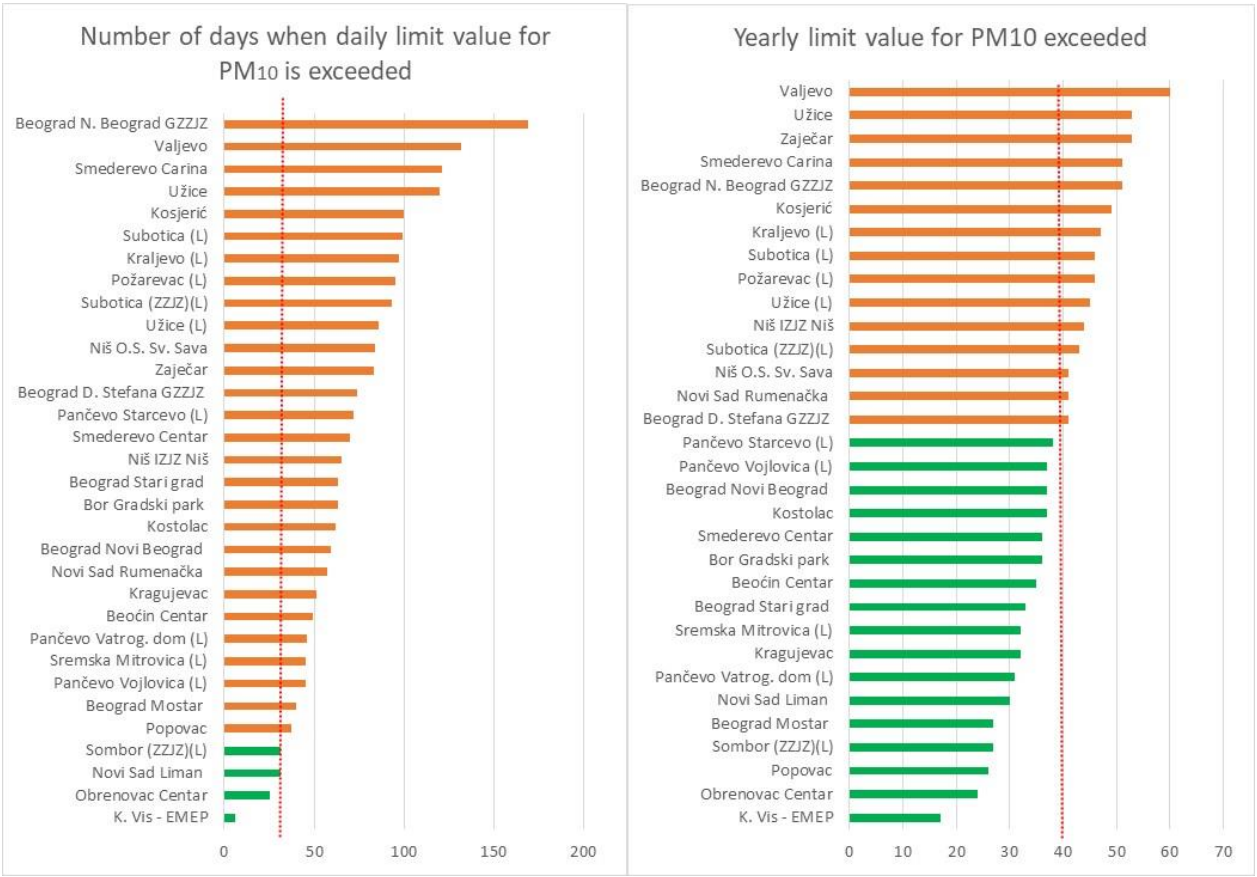


In 2019 92,4% of the population living in those agglomeration (3,053 Mio.) where ambient air was too polluted and where tolerant values for one or more pollutants are exceeded, where in 2014 this share was 57,5%.

The assessment of the composition of the exceedances of limit values show that the main source of exceedances is due to exceedances in PM_{10}. Number of calendar days where limit values for the protection of human health of 50 µg/m^3 can be exceeded is 35. This requirement was exceeded in 28 out of 32 locations included in the national network where this parameter is measured (Figure 8)

[17] Note: including cities with air quality measurements that belong to Zone Serbia and Zone Vojvodina

Figure 8 : Air quality measuring point with number of days where daily limit value of 50 µg/m^3 was exceeded and where yearly limit value for PM_{10} is exceeded



Furthermore, PM_{10} has a yearly for the protection of human health a limit value of 40 µg/m^3 which has not to be exceeded in a calendar year, however in 2019 in the Republic of Serbia out of 32 locations this limit value was exceeded in 15 and in total there is 16 locations of air quality monitoring where both parameters are exceeded.

Significant exceedances are observed also for the $PM_{2.5}$ where target value of $PM_{2.5}$ for a calendar year is set at 25 µg/m^3. Target value was in 2019 exceeded at 12 out of 16 measuring points. In addition, it has to be noted that Average Exposure Indicator (AEI) in the Republic of Serbia for the three years (2017,2018,2019) period is estimated[18] in the range between 31-34 µg/m^3 which is well above the 20 µg/m^3 threshold as set for 2017 in Annex XIII of the Regulation on conditions for air quality monitoring and requirements ("Official Gazette of the RS", No. 11/10, 75/10, 63/13) as deadline for reaching the allowable level of exposure.

In addition to exceedances of PM_{10} and $PM_{2,5}$ for two locations (Belgrade-D.Stefana and Belgrade-Mostar) in 2019 exceedances of the NO_2 yearly limit values were observed. It has to be noted that both stations are characterised as urban traffic stations which indicates that emissions from transport are also an issue in dense agglomerations such as Belgrade is.

[18] In principle urban background stations should be used but suburban background stations may be included as well if there is no urban background station and it is considered as representative of $PM_{2.5}$ levels in the city. It is not possible to provide a precise estimate of the AEI because: There is currently no established list of $PM_{2.5}$ measurement points for the purpose of calculating the AEI. Furthermore, in 2017 and 2018, few valid statistics were available for $PM_{2.5}$ compared to 2019. So only an estimate can be provided, based on annual statistics for fixed measurements available in SEPA annual reports.

Exceedances of the SO_2 daily limit values are in 2019 isolated to only three measuring stations, all in agglomeration of Bor, where main source of SO_2 emission are processes emissions from copper mining and smelting complex located on the eastern outskirts of city of Bor. It should be noted that in the same city, the target values for arsenic and cadmium were exceeded by several degrees of magnitude.

Territory exposed to ozone exceedances of the target value for the protection of vegetation was in the reference year, as calculated by the CHIMERE model, amount to 1.440.288 km^2, which is 38,7% of the totals surface area.

The current effects on the health impacts of air pollution in Serbia have been assessed by Alpha-RiskPoll (ARP) which is using the updated model analysis methods which have been applied to cost-benefit analyses of policies proposed by the EC (European Commission) and the United Nations Economic Commission for Europe (hereinafter: UN/ECE), in particular for setting the emission reduction objectives of the Gothenburg Protocol of the UN/ECE Air Convention and the objectives of the EU National emission ceilings (NEC/ 2016/2284/EU) Directive.

The quantification of health effects is specific to age groups for which exposure-response functions have been developed on the basis of epidemiological studies. Some health effects indicators are calculated specifically for more fragile populations, such as children and the elderly.

The health impacts quantified for the preparation of this programme are chronic and acute effects of population exposure to concentrations of fine particles ($PM_{2.5}$), tropospheric ozone (O_3) and nitrogen dioxide (NO_2), in terms of morbidity and mortality. Effects are qualified as "acute" when they are due to an increase in ambient exposures of a few days (e.g. hospital admissions), and as "chronic" when they are due to ambient exposures of a longer term, sometimes life-long duration (e.g. mortality). The results of the assessment of the current situation are presented in the Table 3-1 below.

Table 3-1 Estimated health impact due to current ambient air quality in the Republic of Serbia[19]

Health impacts in the Republic of Serbia	Unit	Pollutant	REF
			2015
Acute Mortality (All ages)	Premature deaths	O_3	461
Respiratory hospital admissions (>64)	Cases		242
Cardiovascular hospital admissions (>64)	Cases		2 061
Minor Restricted Activity Days (MRADs all ages)	Days		1 415 555

[19] Health Impact and Cost-benefit Assessment - Approach and Results for Serbia (Report under activity 3.14) can be obtained at https://eas3.euzatebe.rs/en/news/public-debate-on-the-draft-programme-of-air-protection-of-the-republic-of-serbia-for-the-period-from-2022-to-2030-with-the-action-plan-was-held

Health impacts in the Republic of Serbia	Unit	Pollutant	REF 2015
Chronic Mortality (All ages)	Life years lost	$PM_{2.5}$	92 013
Chronic Mortality (30yr +) deaths	Premature deaths		9 773
Infant Mortality (0-1yr)	Premature deaths		9
Chronic Bronchitis (27yr +)	Cases		5 934
Bronchitis in children aged six to 12	Added cases		22 762
Respiratory Hospital Admissions (All ages)	Cases		4 261
Cardiac Hospital Admissions (All ages)	Cases		5 144
Restricted Activity Days (all ages)	Days		8 656 749
Asthma symptom days (children 5-19yr)	Days		186 041
Lost working days (15-64 years)	Days		2 132 518
Bronchitis in children aged 5 to 14	Added cases	NO_2	2 395
Respiratory Hospital Admissions (All ages)	Cases		2 113
Chronic Mortality (All ages)	Life years lost		6 530
Chronic Mortality (30yr +) deaths mean VSL	Premature deaths		694

By far the highest impact on health are observed due to $PM_{2.5}$, where for the modelling reference year 2015 the estimated premature deaths amount to 9773 premature deaths and more than 92 thousand life years lost. Due to $PM_{2.5}$ concentrations in ambient air it is estimated that the Republic of Serbia in 2015 lost over 2.1 million working days. Considering the fact that ambient air quality has been deteriorating since 2015 the negative effects of air pollution are even higher. It also has to be noted that the numbers as presented in the Table 3-1 above does not contain the transboundary effects of pollutants emitted in the Republic of Serbia on health in the neighbouring countries.

3.3 PROJECTIONS OF EMISSIONS BASED ON THE EXISTING MEASURES FOR YEARS 2020-2030 ANY BEYOND

The Baseline Scenario or with existing measures scenarios (hereinafter: WEM), assumes that no other policies and measures with impact on air pollutants will be adopted up to 2030 than those in adopted by the end of 2020. The WEM scenario also envisage that measure that PaMs have been adopted by the end of 2020 will also be fully implemented in the scope and timing as envisaged by the relevant policy documents. It has to be noted that one of the most important policy documents which is included in the WEM scenario is NERP which targets the biggest single source polluters in the power sector in the Republic of Serbia. The implementation of the plan in the scope and dynamics as envisaged will have a significant effect in the reduction of national emissions or air pollutants but will not necessarily have significant effect on the concentrations

of air pollutants in cities and agglomerations since the impact of emissions reductions are to be dispersed on the large proportion of the Republic of Serbia's territory which is not necessarily covered by dense agglomerations.
According to the baseline scenario, emissions of air pollutants will are projected to be as presented below (Table 3-2)

Table 3-2 Projection of air pollutants in accordance with WEM scenario

Year	NO_x	SO_2	VOC	PM_{10}	$PM_{2.5}$	NH_3
	kt	kt	kt	kt	kt	kt
2015	144.1	365.96	131,7	76,9	55,8	83.8
2020	140.0	365.99	125,0	79,5	57,7	84.3
2025	79.1	42.9	120,7	66,9	50,6	78.6
2030	72.0	38.4	116,2	64,0	48,4	79.4
2035	64.4	29.3	108,3	62,8	47,9	76.3

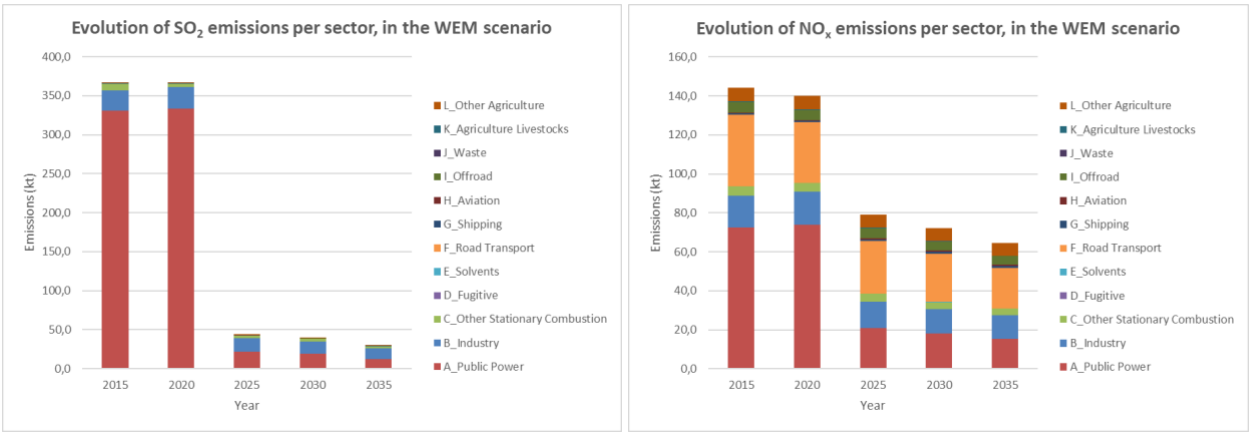
The implementation of several existing regulations and measures selected in the WEM scenario compared to the 2015 emission levels, enables the reduction of pollutant emissions in 2030, by: 89% for SO_2, 50% for NO_x, 12% for VOC, 17% for PM_{10}, 13% for $PM_{2.5}$ and 5% for NH_3 and, in 2035, by: 92% for SO_2, 55% for NO_x, 18% for VOC, 18% for PM_{10}, 14% for $PM_{2.5}$ and 9% for NH_3.

Table 3-3 Projected emission reductions of air pollutants in accordance with WEM scenario

Emission evolution compared with 2015 (%)	NO_x	SO_2	VOC	PM_{10}	$PM_{2.5}$	NH_3
2020	-3%	0%	-5%	3%	3%	1%
2025	-45%	-88%	-8%	-13%	-9%	-6%
2030	-50%	-89%	-12%	-17%	-13%	-5%
2035	-55%	-92%	-18%	-18%	-14%	-9%

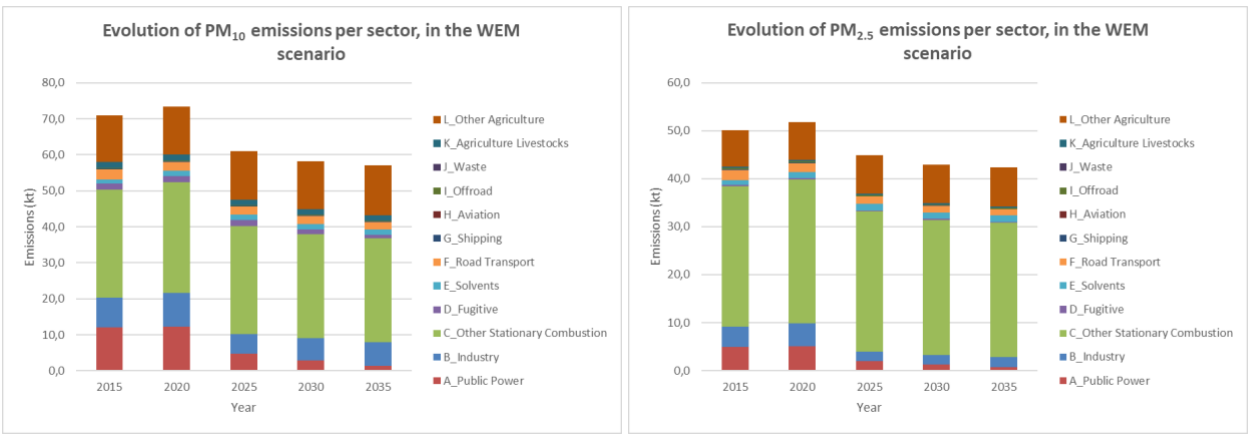
The largest emission reductions are obtained for SO_2 and NO_x, with 92% and 55% respectively in 2035 compared with 2015 emissions. The largest SO_2 and NO_x emission reductions per sector, are achieved in the public electricity and heat production (GNFR A), and to a lesser extent in the Industry (GNFR B). For NO_x, the Road transport (GNFR F) also has a significant contribution to the achieved emission reductions. These remarkable results highlight the efficiency of the existing measures considered in the WEM scenario in particularly timely and effective implementation of NERP, Regulation on limit values of emissions of pollutants into the air from combustion plants and Regulation on limit values of emissions of air pollutants from stationary pollution sources, excluding combustion plants.

Figure 9 : Evolution of SO_2 and NOx emissions in the WEM Scenario



For PM_{10} and $PM_{2.5}$ emissions, the reductions are lower than for SO_2 and NO_x (20% and 15% in 2035, respectively). Indeed, in the scenario WEM, no existing measures enable to tackle PM emissions from the residential combustion which are predominant in 2015[20] and remain predominant in the period from 2020 to 2035. PM emissions will not be reduced significantly without such measures addressing this large number of small emitters.

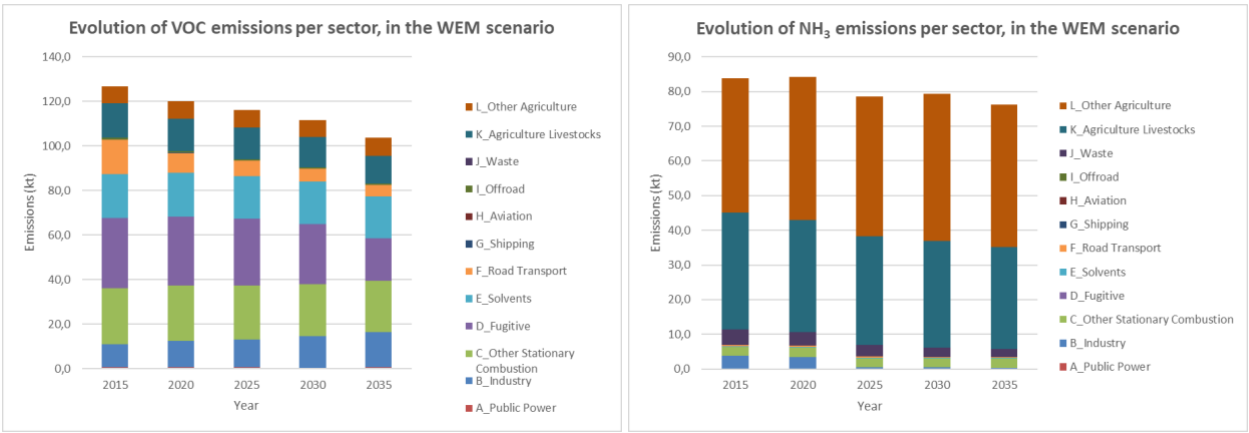
Figure 10 : Evolution of PM_{10} and $PM_{2.5}$ emissions in the WEM Scenario



VOC emissions are slightly reduced (18% by 2035, compared with 2015). For this air pollutant, emission reductions will be larger when measures will be considered for reducing the imports of old second-hand vehicles (accounted in GNFR F) and for reducing emissions from solvent uses in industry (included in GNFR E) not considered in the WEM scenario. Other sectors such as the residential wood combustion (in GNFR C), the use of domestic solvents (in GNFR E) or the food and beverage industries (in GNFR B) are also large contributors of national VOC emissions where emissions are driven by the evolution of the activity data.

[20] See report 3.3.1 “Description of the baseline scenario (WEM) and methodologies for emission projection scenarios”, chapter 2

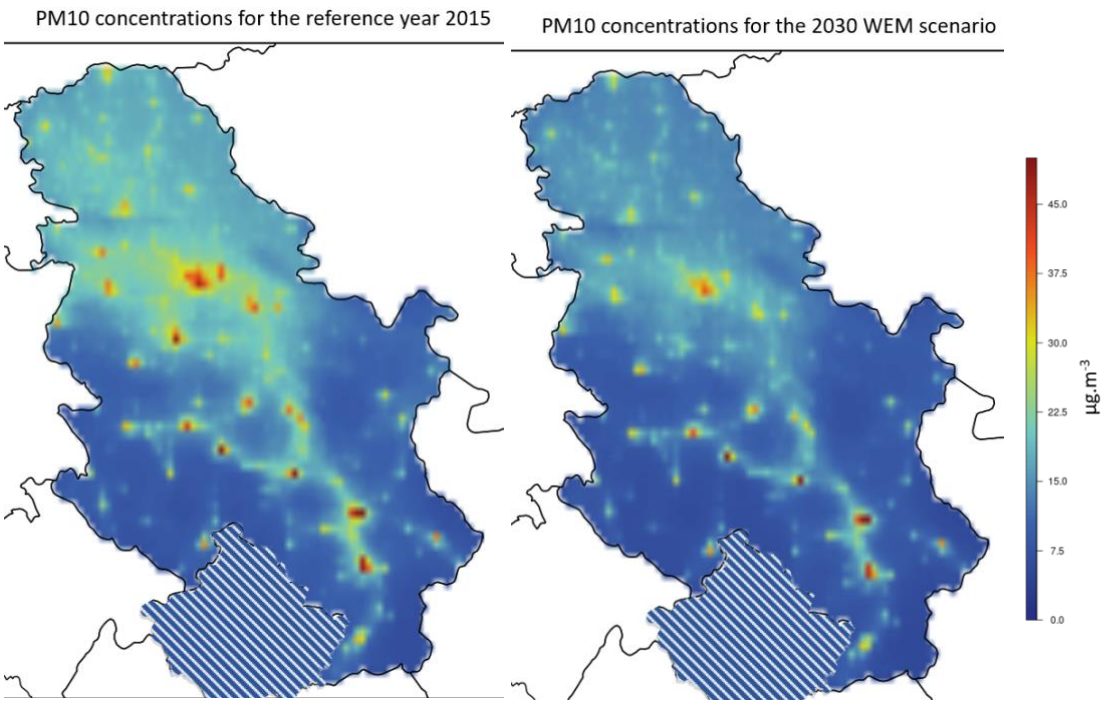
Figure 11 : Evolution of VOC and NH_3 emissions in the WEM Scenario



For NH_3, the reduction of emissions is mainly due to the reduction of the activities considered, and particularly the decrease of the livestock (i.e., GNFR K), as well as the implementation of regulations governing the production of urea and ammonium nitrate from 2015.

Impacts of the WEM scenario on air quality is assessed through a modelling exercise carried out with the Chimère model, considering the WEM 2030 emissions.

Figure 12 : Comparison of the PM10 concentrations between reference year 2015 and WEM scenario in 2030

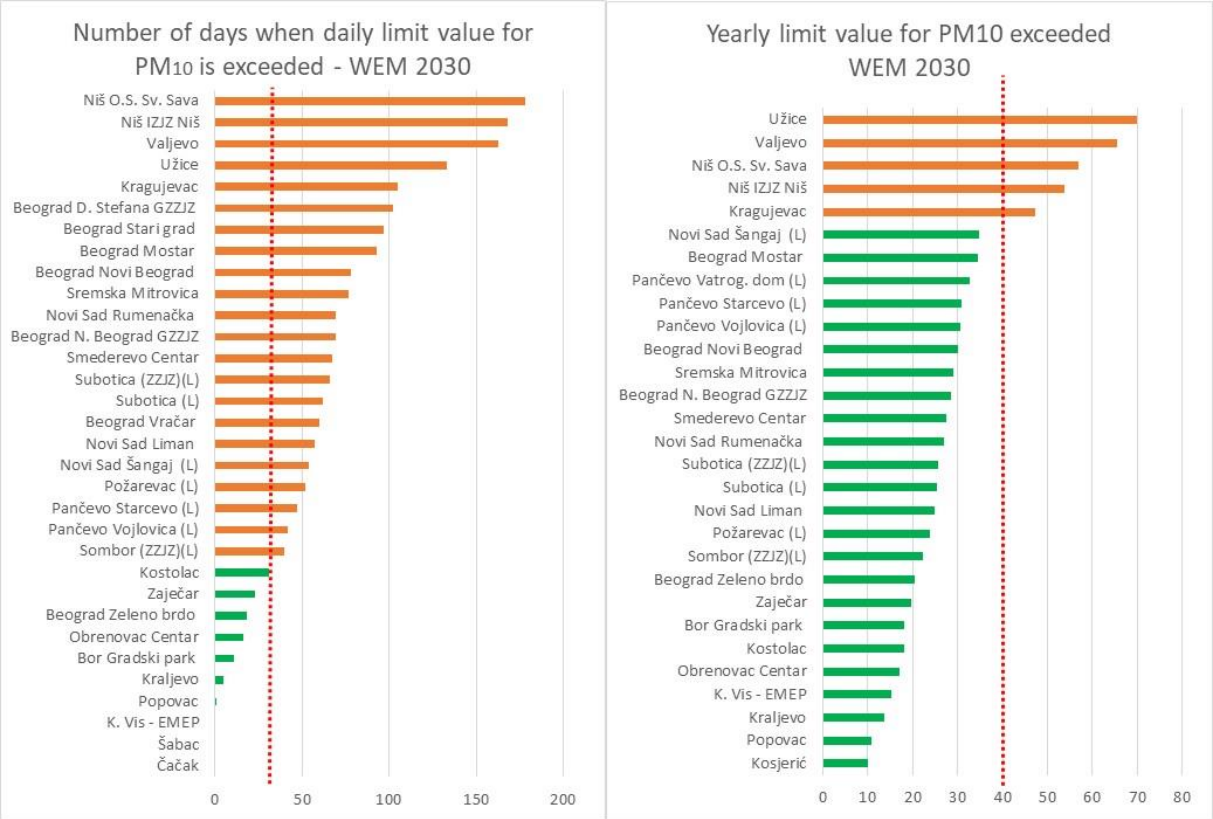


Despite the reductions of air pollutants in the power sector due to implementation of the NERP, which primarily target emissions of SO_2 and NO_2 and contribute to the improvement of the air quality in the Republic of Serbia, particles levels are still high in the cities and agglomerations. The comparison shows that for PM_{10} and also for $PM_{2,5}$ hotspots will with baseline (WEM) scenario maintain to be present in 2030. SO_2 exceedances are also maintained in Bor despite a strong reduction of the concentrations (79%) but NO2 exceedances are avoided with the NO_2 concentration reduction (27%) consecutive to the WEM scenario.

Average annual concentration of respectively $PM_{2.5}$ and PM_{10} are with the WEM scenario expected to drop by about 20% and 19% in 2030[21]. These reductions in both emissions and concentrations in the WEM scenario which are occurring mainly due to implementation of NERP will still not be sufficient to address the exceedances of PM_{10} and $PM_{2.5}$ concentrations in the ambient air in the Republic of Serbia. According to the modelling result in 22 out of 32 PM_{10} air quality measuring points exceedances of the daily limit values will in 2030 still occur in scenario with existing measures. For $PM_{2.5}$, this is 11 measuring points that still show exceedances with the WEM scenario.

As a consequence, if no additional measure will be taken will, it is expected that in 2030 almost 3,135 million inhabitants of the Republic of Serbia will be exposed to poor air quality, of which 94,8% of inhabitants living in zones and agglomerations which is more than six times more than the EU-28 population exposed to concentrations above EU standards[22] (15% of urban population).

Figure 13 : Air quality measuring point with number of days where daily limit value of 50 µg/m³ was exceeded and where yearly limit value for PM_{10} is exceeded in 2030 – WEM Scenario



Due to some progress in the emission reductions which is expected to be achieved with implementation of existing PaMs, it is expected that the number of premature deaths due to exposure to $PM_{2.5}$ concentrations in the ambient air will in 2030 still amount to 7.373 per year which is 24.6% reduction compared to 2015 numbers. By 2030 health impacts expressed in life

[21] In order to ensure timeseries consistency in 2030 the same measureing stations as in 2015 were considered.
[22] https://www.eea.europa.eu/publications/air-quality-in-europe-2020-report

years lost are also expected to decrease from over 92 thousand in 2015 to 60 thousand in 2030 which is a 34,4% reduction.

In comparison with the EU-28 it is expected that even with implementation of WEM scenarios Serbia will in 2030 still have 39% more premature deaths[23] than the EU-28 was having back in 2018.

Expected noncompliance of ambient air quality with the EU standards, high share of inhabitants still exposed to poor air quality and well above average health impacts of poor air quality on the Serbian population call for the Republic of Serbia to prepare a comprehensive Programme to ensure that its inhabitant in the future will not be exposed to such harmful effect of the poor ambient air quality.

As highlighted in Figure 10 above the main contributors to the poor air in the Republic of Serbia in 2030 are C. Other stationary combustion (dominating by residential heating) which in 2030 contributed 54,1% of the PM_{10} and 69,2% of the $PM_{2.5}$ emissions, followed by Agriculture field burning contributing 20,9% of the PM_{10} and 15,7% of the $PM_{2.5}$ emissions, followed by industry and transport with 12,9% of PM_{10} and 7,0% of $PM_{2.5}$.

4 VISION

Previously described current situation, public health crisis due to air pollution, raising awareness of the negative effects of the ambient air pollution, the long-term requirements of the Convention on Long Range Transboundary Air Pollution and its Gothenburg protocol, as well as the European Union accession process are the basis for a long-term vision of the program. The Vision enshrined in this Programme is that:

The Republic of Serbia is to ensure that by 2030 everybody should be able to breathe clean ambient air.

This vision provides the short/medium-term perspective required for policy planning and implementation, as well as the long-term ambition that is required by the nature of the policy issue and of the international requirements, namely at the level of the United Nations Convention on Long range transboundary air pollution and of the EU upcoming EU Clean Air Package.

This vision means that, by 2030, the changes introduced in the Serbian air quality relevant policy framework, will allow the country to enter a smooth pathway towards achieving clean ambient

[23] Serbia will according to WEM Scenario in 2030 have 1038 premature deaths/Mio inhabitants do to PM2.5 exposure while the EU average for 2018 is 757 premature deaths/Mio inhabitants

air for everyone, minimizing the costs and maximizing the health benefits accruing from such transformational change in the country.

5 AIR QUALITY MITIGATION SCENARIOS

For the programme purposes and achievement of the air quality vision, in addition to baseline scenario, three air quality mitigation scenarios have been analysed[24]: All scenarios are developed using models[25] that are also used for definition of the EU targets and pathways up to 2020, 2030 and respective PaMs, while national circumstances were taken into account. All scenarios are developed using models that are also used for definition of the EU targets and pathways up to 2020, 2030 and 2050 and respective PaMs, while national circumstances were taken into account. The base year used for expression of the reduction of air pollutants reduction is 2015. Therefore, the reduction in emissions of Air pollutants efforts are shown compared to the GHG emission level in 2015. In addition, in order to compare the emission reduction with the base year as used in for the compliance with Reduction of National Emission of Atmospheric Pollutants Directive and Gothenburg protocol, these efforts are shown also compared to 2005, however achievement of the goals will be monitored and reported compared to 2015.

All the air quality mitigation scenarios are:

1) **WAM A Scenario:** Full implementation of all relevant EU directives and regulations related to ambient air quality not yet fully transposed and implemented[26].
2) **WAM B Scenario:** It is intensive control scenario. In addition to WAM A, introduction in some cases, of stricter emission limit values and introduction of national financial and fiscal policies and measures in key emission source categories (such as scraping and promotion schemes for passenger cars and household wood/coal appliances).
3) **WAM C Scenario:** Full control scenario. In addition to WAM B, all necessary measures including local specific measures (such as incentives, restrictions and bans) aiming to ensure compliance with limit values as defined in Directive 2008/50/EC regarding particles ($PM_{2.5}$ and PM_{10}), NOx, SO_2 and O_3.

Detailed data on projection of pollutant emissions in the air by 2030 for each polluting matter and for each scenario are provided in Annex 3 – Overview of scenarios of air emissions by sectors, which is printed along with this Programme and forms its integral part.

Figures below shows the air pollutants emissions pathways in the three WAM scenarios.

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[24] Scenario analysis is a process of analysing possible future events by considering alternative possible outcomes (sometimes called "alternative worlds"). Thus, scenario analysis does not try to show one exact picture of the future. Instead, it presents several alternative future developments. In contrast to prognoses, the scenario analysis is not based on extrapolation of the past or the extension of past trends and does not expect past observations to remain valid in the future. *Aaker, David A. (2001). Strategic Market Management. New York: John Wiley & Sons. pp. 108 et seq. ISBN 978-0-471-41572-5. / Bea, F.X., Haas, J. (2005). Strategisches Management. Stuttgart: Lucius & Lucius. pp. 279 and 287 et seq.*

[25] For the preparation of the Programme modified GAINS, CHIMERE and Alpha-RiskPoll (ARP) models were used

[26] Detailed report on WAM A, WAM B and WAM C scenario set-up is available at https://www.ekologija.gov.rs

Figure 14: the evolution of emissions of PM2.5 and PM10 by 2030 and beyond

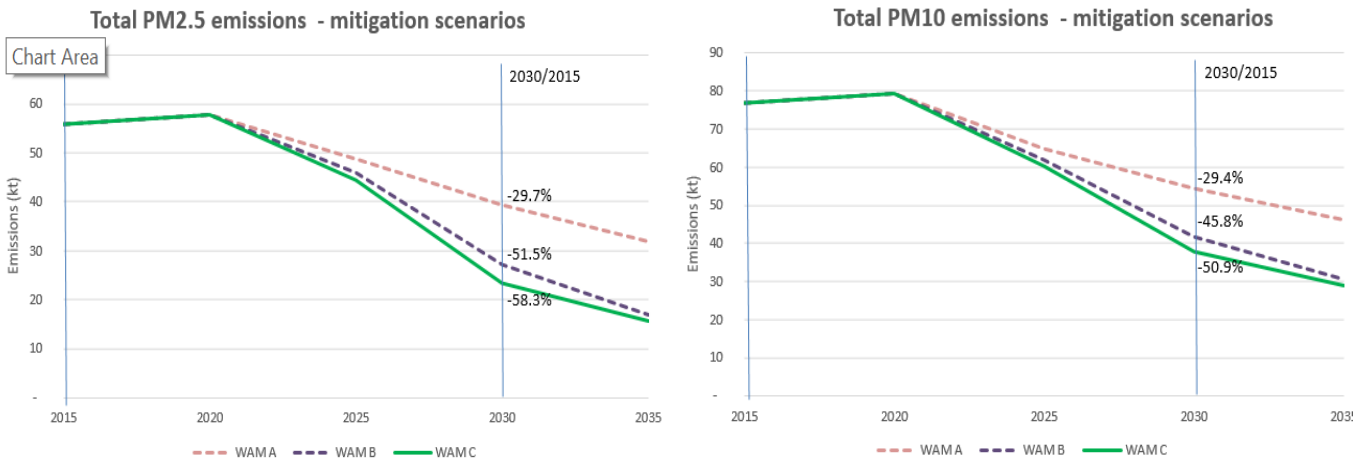


Figure 14: The evolution of emissions of NOx and SO2 by 2030 and beyond

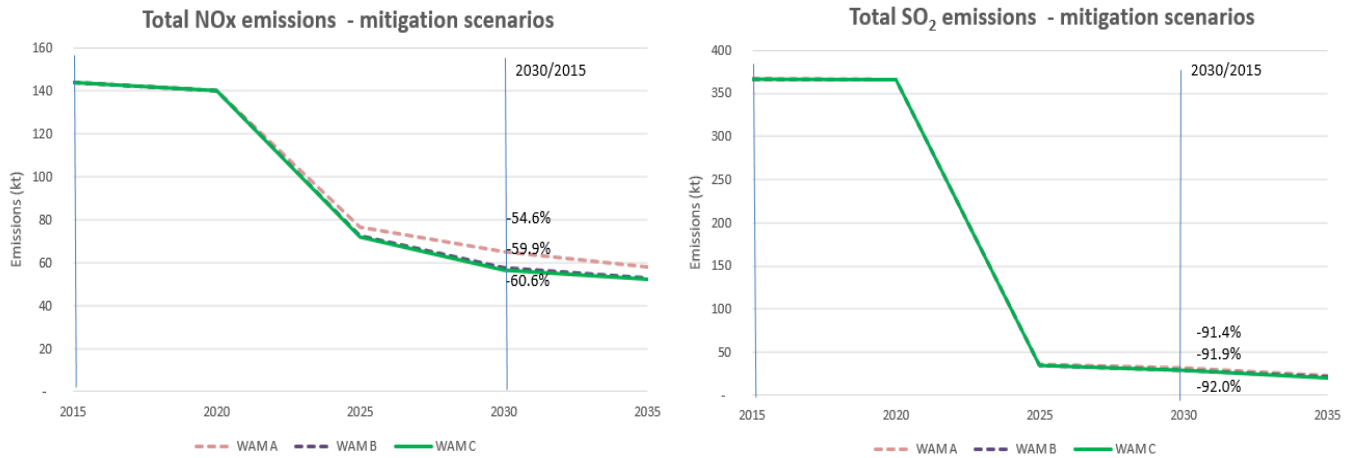
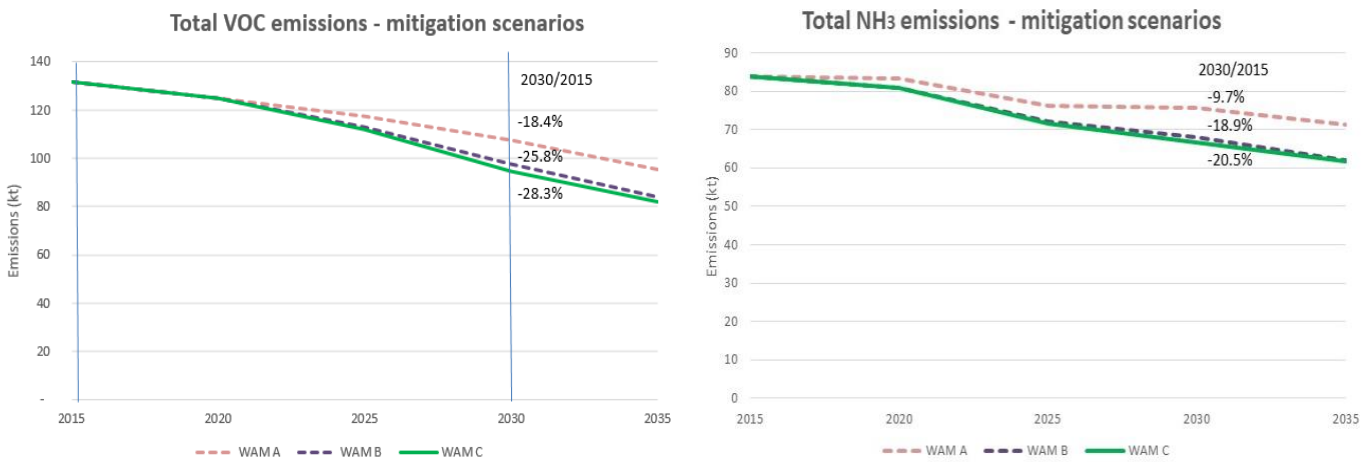


Figure 15: The evolution of emissions of VOC and NH_3 by 2030 and beyond



The main focus of the Scenarios and its emission reduction efforts was ensuring the compliance with the EU regulatory framework in the field of air quality PaMs and implementation of good practices in agriculture sector while stepping up the necessary measures to reduce PM_{10} and

$PM_{2.5}$ emissions where the assessment of current situation indicates that the Republic of Serbia has to make significant improvements in its policy implementation.

WAM A Scenario

Therefore, in the WAM A scenario, all relevant EU Directives or Regulations are considered to be applied from a given date depending on activities. When, in some cases, the existing regulations may set up stricter ELVs than the EU Directives or Regulations, the stricter obligations are considered such as for Regulation on limit values of emissions of pollutants into the air from combustion plants which can define stricter emission limit values for medium and small plants than the medium combustion plan directive (MCPD) for some fuels or some sizes of installations. WAM A scenario foresees the compliance with MCPD in 2025 for existing installations with the rated thermal input larger than 5MW and in 2030 for those installations where the rated thermal input larger than 1MW. For small domestic appliances using solid fuels the implementation of the EU Eco-design Directive and Regulations 2015/1189 and Regulation 2015/1185 will apply from year 2025 with assumption that 30% of the appliances will be replaced by 2030 and 55% by 2035 mainly through the natural substitution. When it comes to liquid fuels WAM A scenario assumes that heavy fuel oil with less than 1% sulphur will be available for consumers starting from 2021. When it comes to industrial processes only the less strickt upper level of the best available technique (hereinafter: BAT AELs) associated emission levels can be applied and full compliance with IED chapter II provisions is envisaged by 2025, except for installations requiring extended implementation period. Activities using solvents as covered by Industrial emission directive Chapter V and Annex VII are in WAM A scenario aligned with Regulation on the list of industrial installations and activities in which volatile organic compounds emissions are controlled, values of emission of volatile organic compounds under specific consumption of solvents and total permissible emissions, as well as emission reduction scheme with the full compliance expected in 2025. Compliance of the Petrol terminals and service station with Directive 1994/63/EC on the control of VOC resulting from the storage of petrol and its distribution from terminals to service stations and Directive 2009/126/EC on Stage II petrol vapour recovery during refuelling of motor vehicles at service stations is foreseen only by 2030. WAM A scenario in road transport envisages the stepping up of the EURO standards for imported second hand vehicles. According to WAM A scenario the minimum EURO 4 requirement for imported second hand passenger cars will enter into force in 2023, EURO 5 in 2025 and EURO 6 in 2030. The same timeline is envisaged for EURO IV, EURO V and EURO VI cargo vehicles. For new off road machinery Regulation (EU) 2016/1628 on requirements relating to gaseous and particulate pollutant emission limits and type-approval for internal combustion engines for NRMM is expected to be in force only for new machinery from 2025 onwards.

In the Republic of Serbia, NH_3 emissions from agriculture sector could be substantially reduced through consistent use of good nitrogen management practices at all stages of the farming process: livestock diet, housing, manure storage, spreading. Ideally, measures to reduce NH3 emissions should be applied to all stages of the farming process. Otherwise, nitrogen retained at one stage (for example at storage with a cover) could be lost at the next stage as NH3 (for example at spreading if there is no reduction technique). Policies and measures applicable in the WAM A scenario in the agriculture sector are focusing on introduction of best practices at spreading for slurry application by trailing hose and incorporation within four hours and 12 hours

(pig and cattle manure) and incorporation of urea into soil through where the level of incorporation should steadily increase to 25% in 2035.

Through the implementation of PaMs as contained in the WAM A scenario as elaborated above the $PM_{2.5}$ emissions will decrease for 29.7% by 2030 compared to 2015 (additional 16.4% compared to WEM), while PM_{10} is expected to decrease for 29.4% in the same period (additional 12.6% compared to WEM). Those reductions in PM_{10} and $PM_{2.5}$ emissions in WAM A scenario would ensure the compliance of the bottom up sectoral measures with the EU environmental framework, however the reduction is not sufficient to ensure the compliance with requirements arising from Ambient Air Quality Directive 2008/50/EC. The dispersion modelling shows that with implementation of WAM Scenario Serbia can still expect that number of allowed days when PM_{10} concentrations exceed 50 $\mu g/m^3$ will be exceed in all major agglomerations and cities such as Belgrade, Novi Sad, Subotica, Smederevo, Pančevo, Sremska Mitrovica, Kragujevac, Niš, Užice and Valjevo where we can expect as much as 131 daily exceedances of PM_{10}. In addition to daily exceedances it is expected that in Užice, Valjevo, Niš and Kragujevac (on the borderline) annual mean PM_{10} concentrations limit values which are set at 40 $\mu g/m^3$ will also be exceeded, as well as $PM_{2.5}$ annual concentrations limit values (20 $\mu g/m^3$) in Užice, Valjevo, Niš and Belgrade. In addition to the issues related to the PM_{10} and $PM_{2.5}$ pollutions in the WAM A scenario the SO_2 emissions in Bor will still cause the exceedance of SO_2 limit values on daily mean concentrations (not more than three exceedances of the 120 $\mu g/m^3$). Concerning NO_2 concentration, simulations shows a further reduction of concentrations compared to the WEM scenario by 5% coherent with the relatively small reductions in NOx emissions. As already mentioned in previous paragraph, the WEM scenario is sufficient to avoid exceedances of the NO_2 limit values.

Together with the reduction of other pollutants measures in WAM A scenario also contribute to the reduction of NOx and VOC emissions as precursors of $PM_{2,5}$ and to reduction of NH_3. Emissions of NOx will decrease for 54,6% by 2030 compared to 2015 (additional 4,6% compared to WEM), while VOC emissions will in the same period decrease for 18,4% (additional 6,7% compared to WEM). Due to implementation of "no regret" measures in WAM A scenario in Agriculture sector the NH_3 emissions are also expected to decrease for 9,7% by 2030 compared to 2015 (additional 4,5% compared to WEM).

WAM B Scenario

The WAM B is scenario in an intensive control scenario building on WAM A Scenario. In addition to WAM A, introduction in some cases, of stricter emission limit values and introduction of national financial and fiscal PaMs in key emission source categories (such as scraping and promotion schemes for passenger cars and household wood/coal appliances). It intensifies the old technology phase out and penetration of new clean technologies since natural technology replacement as envisaged in WAM A scenario is not sufficient to by 2030 ensure clean air to everybody in the Republic of Serbia. The main focus of the WAM B scenario is therefore on medium level of the Best Available Techniques associated emissions levels for the large combustion plants and industrial processes and to the acceleration of the replacement of the small domestic appliances using solid fuels through financial incentives with the view to achieve 55% of appliances to be replaced by the end of 2030 and 80% by 2035. Since the road transport

is a significant contributor to the PM_{10} and $PM_{2.5}$ emissions it is envisaged to ban all second hand vehicles without PM traps (e.g. EURO 4 and older) starting from 2023 and to step up this ambition to ban second hand EURO 5 from 2025 onwards, which will still allow for importing up to 10y old second hand cars into Serbia which in Scenario WAM B represent a balance between the increased mobility requirements of population and protection of environment. The same concept is applied also for light duty vehicles, heavy duty vehicles and busses. In parallel the WAM B scenario is in the period from 2024 to 2026 envisaging the scrapping programme targeting up to 140 000 of oldest diesel passenger cars and light duty vehicles ((except N3) pre-euro to Euro 3) and diesel buses (pre-euro to Euro III) that still might be in a circulation. In Agriculture sector WAM B scenarios from 2024 envisages the more intensive penetration of slurry application by injection, which is an important measure for protection of ground water which in many locations in the Republic of Serbia represent the main source of drinking water, partial substitution from urea to ammonium nitrate fertilizer, covering the slurry storages and reducing excesses in the protein supply (for animal feeding) for decreasing nitrogen excretion. Furthermore, full ban of agriculture field burning is to be enforced by 2035.

Implementation of measures listed in the WAM B scenario will further significant decrease emission of PM_{10} for 45.8% by 2030 compared to 2015 (additional 16.4% compared to WAM A), while $PM_{2.5}$ emissions are to decrease for 51.5% in the same period, which is additional 21.8% compared to WAM A Scenario. The implementation of measure will significantly improve the ambient air quality in the Republic of Serbia and will ensure that cities zones and agglomerations such as Vojvodina, Subotica, Smederevo, Sremska Mitrovica, Novi Sad and Pančevo will be in compliance with Ambient Air quality requirements. However, several hot spots such as Belgrade and Kragujevac will still face with poor air quality regarding the attainment of the PM10 limit values, while Niš, Valjevo and Užice will in addition to problems with PM10 concentrations also exceed limit values on annual mean concentrations of $PM_{2.5}$ which is set at 25 $\mu g/m^3$. The attainment of the medium level of the BAT AELs will significantly improve the air quality in Bor, however it is expected that limit values on daily mean SO_2 concentrations will still be exceeded more than three times.

Emissions of NOx are in WAM B scenario will by 2030 compared to 2015 further decreased compared to WAM A scenario for additional 5,3%, while VOC emissions will additionally decrease for 7,4% compared to WAM A. Additional Measures in Agriculture as contained in the WAM B scenario will by 2030 compared to 32015 almost double the emission reductions compared to WAM A scenario (18,9% in WAM B compared to 9,7% in WAM A).

WAM C Scenario

WAM C Scenario is a full control scenario. It is building on the WAM B Scenario and adding all necessary PaMs targeting the remaining ambient air quality hot spots and intensifies the implementation milestones for implementation of measures at the local level to ensure the full compliances with Directive 2008/50/EC regarding particles ($PM_{2.5}$ and PM_{10}), NOx, SO_2 and O_3. In the WAM C, it was assessed that, to obtain further PM emission reductions in the five cities, the use of pellet stoves and boilers and heat pumps was necessary. The WAM C based on multiple runs of the CHIMERE chemistry transport model by 2030 envisages the replacement rate of old

domestic appliances using solid fuels with new heating appliances compliant with Eco design regulations, is as follows:

1) Kragujevac (requirement for additional 15% PM emission reductions compared to WAM B in 2030): 58% of domestic appliances are replaced in 2030 with eco-design appliances considering a high proportion of wood pellet appliances, 25%.
2) Beograd (requirement for additional 20% PM emission reductions compared to WAM B in 2030): 58% of domestic appliances are replaced in 2030 with only eco-design pellet stoves or boilers.
3) Valjevo and Niš (requirement for additional 50% PM emission reductions compared to WAM B in 2030): 74% of domestic appliances are replaced in 2030 with 50% of eco-design pellet stoves or boilers and 50% of heat pumps.
4) Užice (requirement for additional 65% PM emission reductions compared to WAM B in 2030): 80% of domestic appliances are replaced in 2030 with 15% of eco-design pellet stoves or boilers and 85% of heat pumps.

In addition, specific measures targeting the emissions from copper smelting industry in Bor are added in WAM C scenario in order to ensure that limit values regarding the SO_2 in Bor are not exceeded any more.

Furthermore, in Agriculture sector, the phase out of agriculture waste burning is considered to be fully enforced in 2030 instead of 2035 in the WAM B. While the remaining issue with SO_2 concentrations in Bor is WAM C scenario addressing through implementation of the lower BAT AELs.

Implementation of measures included in WAM C scenario will further decrease emissions of PM_{10} and $PM_{2.5}$ at the national level. Since the WAM C scenario is targeting specific local level hot spots the additional the additional emission reduction on national level is limited. Emission of PM_{10} is expected to decrease for 50.9% by 2030 compared to 2015 which is additional 5.1% compared to WAM B, while emissions of $PM_{2.5}$ is projected to decrease for 58.3% in the same period, which is 6.8% more compared to WAM B.

Measures included in WAM C scenario will at the national level decrease SO_2 emission for only additional 0,1% by 2030 compared to 2015 compared to WAM B, however they will have significant local effect on SO_2 emissions and SO_2 concentrations in ambient air in Bor ensuring the limit values will not be breached. Furthermore, the NOx and VOC emissions will in the same period also additionally decrease compared to WAM B for 0,7% and 2,5% respectively. Additional reductions in WAM C scenario are also expected for NH_3 emissions, due to additional measures in agriculture sector which are expected to further decrease NH_3 emissions for 1,6% compared to WAM B scenario.

With implementation of WAM C scenarios the air quality in the Republic of Serbia is expected to be in compliance with EU legislative framework.

Results of the CHIMERE model regarding the effects of the mitigation scenarios WAM A, WAM B and WAM C for PM_{10} and $PM_{2.5}$ are presented in the following figures:

Figure 16 and Figure 17[27]:

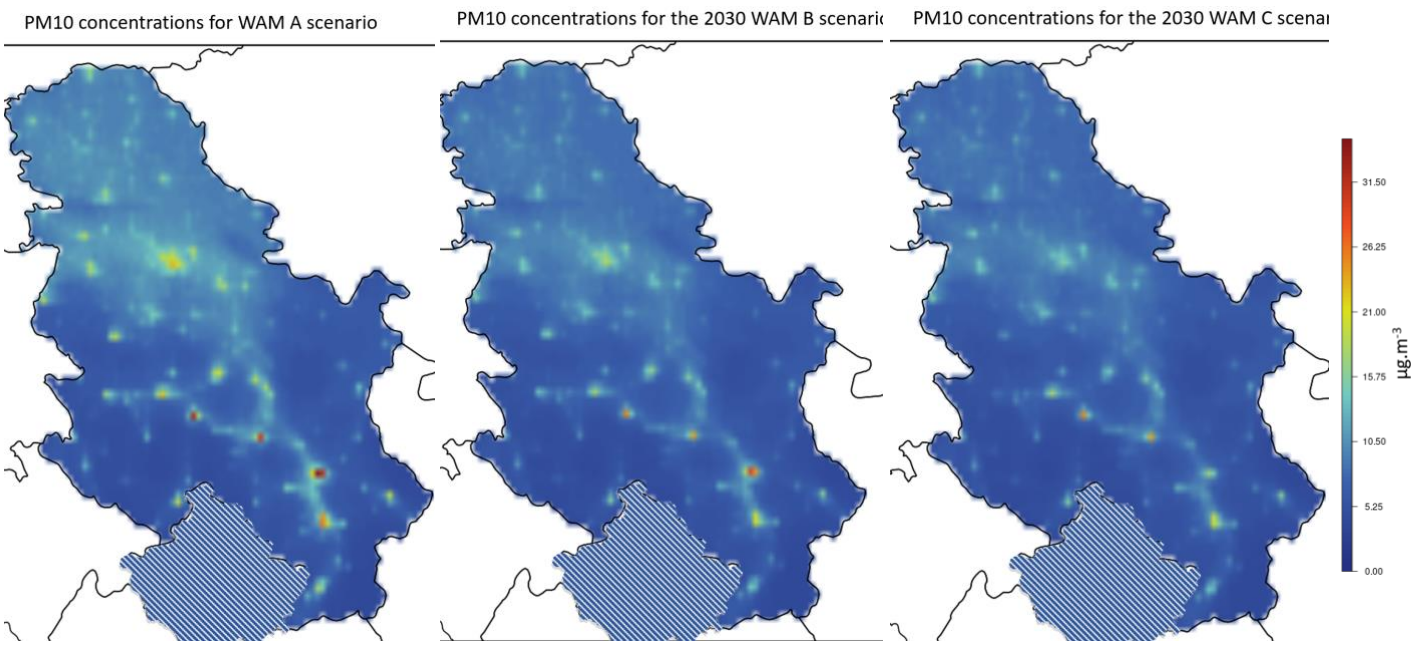


Figure 16 : Results of the CHIMERE chemistry transport model for PM10 for WAM A, WAM B and WAM C Scenario

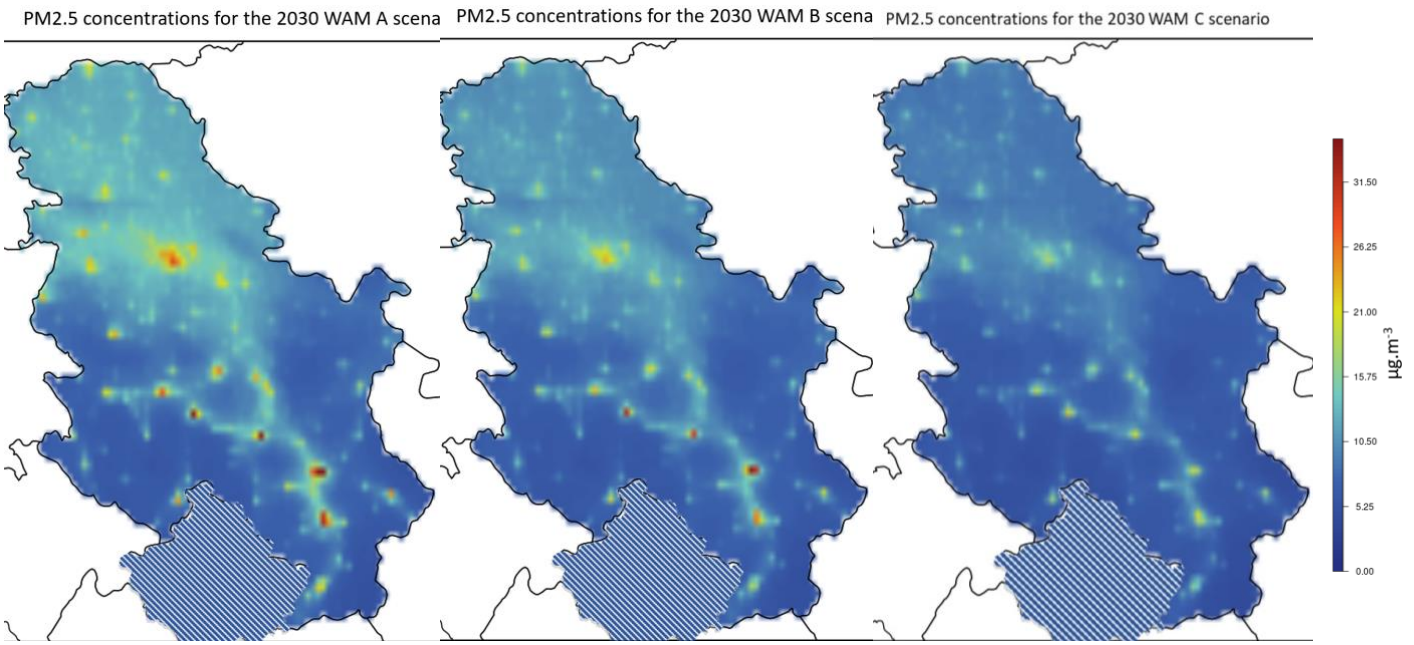


Figure 17 : Results of the CHIMERE chemistry transport model for PM2.5 for WAM A, WAM B and WAM C Scenario

[27] Results of the CHIMERE model regarding the effects of the mitigation scenarios WAM A, WAM B and WAM C on other pollutants are presented in **Error! Reference source not found.**.

The overview of the emission reductions of all pollutants for all scenarios are presented in the **Table 5-1** below.

Table 5-1 Projected emission reductions of air pollutants in accordance with WAM scenarios

Scenario	Target year/year for Comparison	SO_2 emission reduction [%]	NO_x emission reduction [%]	PM_{10} emission reduction [%]	$PM_{2.5}$ emission reduction [%]	VOC emission reduction [%]	NH_3 emission reduction [%]
WAM A	2030/2015	-91,4%	-54,6%	-29,4%	-29,7%	-18,4%	-9,7%
	2030/2005	-92,9%	-60,7%	-3,1%	-5,0%	-27,7%	-29,7%
WAM B	2030/2015	-91,9%	-59,9%	-45,8%	-51,5%	-25,8%	-18,9%
	2030/2005	-93,3%	-65,3%	-25,6%	-34,4%	-34,4%	-36,8%
WAM C	2030/2015	-92,0%	-60,6%	-50,9%	-58,3%	-28,3%	-20,5%
	2030/2005	-93,4%	-65,9%	-32,6%	-43,6%	-36,6%	-38,1%

A. COST and HEALTH & ENVIRONMENTAL IMPACTS OF MITIGATION SCENARIOS

Costs

All pollution reduction pathways resulted from different scenarios are associated with certain costs. The costs addressed in this programme are additional cost compared to WEM scenario, since the cost of implementation of the WEM scenario is already covered through the financing mechanisms of existing policies and measures. For the purpose of investment cost estimates, costs have been allocated to who makes the investments, irrespective of its capacity to pass the costs of the investment down the value chain to consumers and irrespective of any public subsidies or incentives it may receive. Therefore, three groups of investors have been identified. Investors: who represent public or private companies, and farmers. Investors have to invest in the case of most measures in industrial plants, in combustion plants, for non-road mobile machineries, agricultural sectors, in petrol distribution and service stations. The second group are “Consumers”: they are concerned by measures aiming to replace the old domestic heating appliances, buy a more recent second-hand vehicle, replace the oldest vehicles. The “State” as a third group also include local governments. No measures consider would require major investment costs by the state budget with exception of the preparatory of the regulatory framework and policy implementation infrastructure needed from implementation of some measures mainly related to financial incentives. However, when it comes to financing of the investment costs significant support from the state budget is envisaged.

Investment costs have been estimated for each cluster of measure:

1) In industrial plants, in combustion plants, for service stations… investments for reduction techniques are estimated. The reduction techniques are most often pollutant-specific such as a scrubber to reduce SO_2 emissions, an electrostatic precipitator to reduce PM emissions, a low-NO_x burners to remove NO_x emissions.
2) In mobile sources such as road transport vehicles, NRMM, the reduction of emissions is achieved through the use of new vehicles compliant with EU standards (Euro 6 as example

for road vehicles, stage V for NRMM). When an Euro standard is implemented as example, several pollutants may be reduced simultaneously, such PM, VOC, NO_x, etc.

3) In domestic heating appliances using solid fuels for which PM emissions have to reduced, end of pipe techniques are not available. New appliances, more energy efficient and with lower emissions if they are compliant with EU standards from the EU eco-design directive and its regulations are used. These appliances reduced both PM and VOC emissions but may tend to increase NO_x emissions due to larger temperature, larger residence time, etc.
4) In agriculture, the development of the use of best practices require investment in some techniques with better efficiencies or using resources.

Cost for implementation of specific policies and measures is presented as annual total costs, which are the sum of annualised capital cost + operating costs. Annualised investment for the equipment ready to operate is taking into consideration the investment (in €), the annualization period corresponding to the lifetime of the equipment, the annualization rate of 4% is used and is consistent with the rate used by GAINS[28] model. Annual operating costs constituted of fixed operating costs (maintenance, insurance, etc.) and variable operating costs (reagents, electricity, waste disposal, etc.).

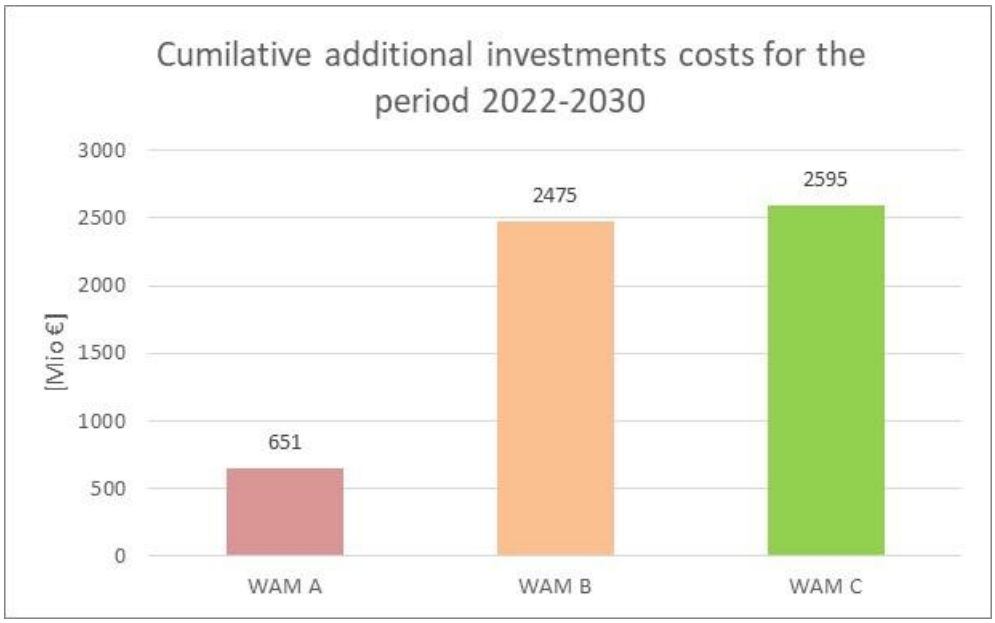


Figure 18 : cumulative additional investment costs for WAM A, WAM B and WAM C Scenario

The assessment of the cumulative investment cost (**Figure 18**), shows that WAM C scenario requires three times the investment costs compared to WAM A and only 4,8% more than WAM B scenario and amounts to 2594,6 Mio€ for the period 2022-2030.

The comparison among the mitigation scenarios, when annualizing the investment cost and adding the operating cost shows that the gap among the scenarios widens. The difference in annualize total costs of WAM A scenario amount to 50,9 Mio€/y, while the annualized total costs of WAM B scenario is 117,8 Mio€ higher and amounts to 168,7mio€/y. The highest annualized total costs are estimated for the implementation of WAM C scenario, where costs amount to 189,2Mio€/y, which is additional 20,6Mio€/y compared to the WAM B scenario. The comparison

[28] GAINS: "GHG and air pollutants synergies and interactions" model developed by IIASA and used by the EU and UNECE for the EU directive 2284/2016 on emission reductions of certain pollutants and the Gothenburg protocol as amended

is show in Figure 20. Detail breakdown of costs is presented in chapter 7.2.1 Cost of implementation

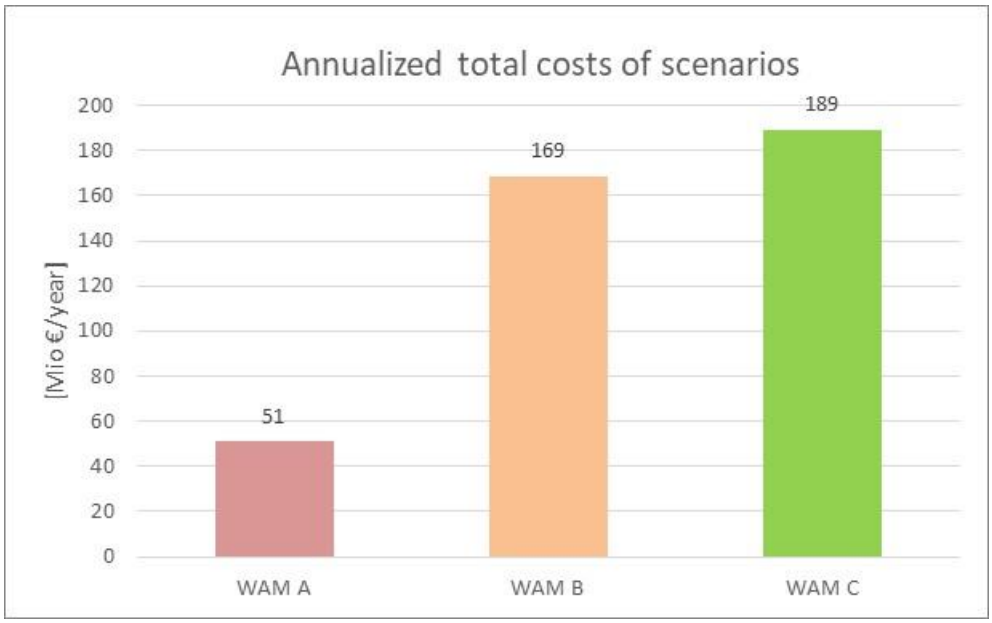


Figure 19 : Annualized total costs of WAM A, WAM B and WAM C Scenarios

Health impacts

In order to evaluate the health impacts due to ambient air pollution two alternative approaches to the quantification and monetary valuation of mortality impacts from air pollution. Premature deaths and years of life lost. For chronic mortality, the indicator of years of life lost is monetised by the value of a VOLY (Value of Life Year), the indicator of premature death is monetised by the value of a VSL (Value of Statistical Life). These values are obtained by willingness-to-pay (WTP) studies[29]. The VSL is a damage cost estimate based on the amount people are willing to pay for a reduction in their risk of dying from a health problem. VOLY is a damage cost estimate based on the loss of life expectancy (expressed in potential years of life lost). This measure accounts for the age at which death occurs.

The modelling of the health impacts using Alpha-Risk Poll model shows that the costliest scenario for the Republic of Serbia is to ignore the health-related cost of poor air quality and not to take any actions.

[29] For early examples of contingent valuation studies used to assess willingness to pay to reduce the risk in premature mortality from air pollution cf. chapters 4.2.1 and 4.3.2 in Hurley et al. (2005). The VSL used in the present study is the result of a meta-analysis carried out by OECD (2012). Recommended values are presented in its chapter 6.1. This source also provides additional information on willingness to pay studies. Hurley, F., et al., 2005, *Methodology for the Cost-Benefit analysis for CAFE: Volume 2: Health Impact Assessment*, Service Contract for Carrying out Cost-Benefit Analysis of Air Quality Related Issues, in particular in the Clean Air for Europe (CAFE) Programme (https://ec.europa.eu/environment/archives/cafe/pdf/cba_methodology_vol2.pdf) accessed 9 February 2021.OECD, 2012, *Mortality Risk Valuation in Environment, Health and Transport Policies*, OECD Publishing, Paris, France (http://dx.doi.org/10.1787/9789264130807-en).

Table 5-2 Annual health impacts by scenario, in respective units and year

Health impacts in the Republic of Serbia	Unit	Pollutant	REF	WEM	WAM A	WAM B	WAM C
			2015	2030	2030	2030	2030
Acute Mortality (All ages)	Premature deaths	O_3	461	365	358	352	352
Respiratory hospital admissions (>64)	Cases		242	225	221	218	217
Cardiovascular hospital admissions (>64)	Cases		2 061	1 922	1 887	1 854	1 852
Minor Restricted Activity Days (MRADs all ages)	Days		1 415 555	1 082 884	1 063 011	1 044 761	1 043 670
Chronic Mortality (All ages)	Life years lost	$PM_{2.5}$	92 013	60 363	54 075	46 918	44 221
Chronic Mortality (30yr +) deaths	Premature deaths		9 773	7 373	6 605	5 731	5 401
Infant Mortality (0-1yr)	Premature deaths		9	4	3	3	3
Chronic Bronchitis (27yr +)	Cases		5 934	4 564	4 089	3 548	3 344
Bronchitis in children aged 6 to 12	Added cases		22 762	14 431	12 928	11 217	10 572
Respiratory Hospital Admissions (All ages)	Cases		4 261	3 103	2 780	2 412	2 273
Cardiac Hospital Admissions (All ages)	Cases		5 144	3 746	3 356	2 912	2 744
Restricted Activity Days (all ages)	Days		8 656 749	6 371 784	5 707 963	4 952 499	4 667 841
Asthma symptom days (children 5-19yr)	Days		186 041	117 950	105 662	91 677	86 408
Lost working days (15-64 years)	Days		2 132 518	1 503 675	1 347 020	1 168 739	1 101 563
Bronchitis in children aged 5 to 14	Added cases	NO_2	2 395	1 348	1 226	1 094	1 075

Health impacts in the Republic of Serbia	Unit	Pollutant	REF	WEM	WAM A	WAM B	WAM C
			2015	2030	2030	2030	2030
Respiratory Hospital Admissions (All ages)	Cases		2 113	1 380	1 255	1 120	1 100
Chronic Mortality (All ages)	Life years lost		6 530	3 843	3 495	3 118	3 063
Chronic Mortality (30yr +) deaths mean VSL	Premature deaths		694	469	427	381	374

As presented in the tables above the implementation of the WEM scenario will have a major health benefits for the Republic of Serbia, the efficiency of the existing measures considered under the WEM scenarios, which indicates the importance of the timely implementation of NERP, measures in the industry sector, in the sector of road transport and implementation of the Regulation on limit values for emissions of pollutants into the air from combustion plants ("Official Gazette of the Republic of Serbia", No. 6/16 and 67/21) and the Regulation of limit values of emissions of pollutants into the air from stationary pollution sources, except for combustion plants ("Official Gazette of the Republic of Serbia", No. 111/15 and 83/21). Chronic mortality is expected to decrease for 41.1% by 2030 compared to 2015. Further decrease in chronic mortality is expected through the implementation of WAM A (-46,5%), WAM B (-52,3%) and WAM C (-53,1%) scenarios. Furthermore, asthma symptom days with children (5y-19y) is expected to decrease by 2030 compared to 2015 with implementation of WAM A, WAM B and WAM C scenarios for 43,2%, 50,7% and 53,6% respectively. Implementation of policies and measures contained in the WAM A, WAM B and WAM C scenarios will also save significant amount of working days compared to 2015. WAM A scenario is to safe additional 0,16Mio working days, WAM B 0,33 Mio working days and WAM C as much as additional 0,40milion working days in 2030 compared to WEM scenario. When monetising all the health impacts in the Republic of Serbia as listed in the Table **5-2** above, the aggregated annual health damage expressed in value of life year in 2030 in WAM A scenario is expected to be reduced by 1845Mio€ compared to 2015 damage. Implementation of WAM B scenario would bring additional 385Mio€ of savings in damage compared to WAM A scenario (in total 2.204Mio€ compared to 2015), while for WAM C the total savings in annual health damage would amount to 2335Mio€ which is additional 132Mio€ compared to WAM B Scenario. Details on aggregated annual health damage expressed both in Value of Statistical Life (VSL) and value of life year (VOLY) are presented in Figure 20 below.

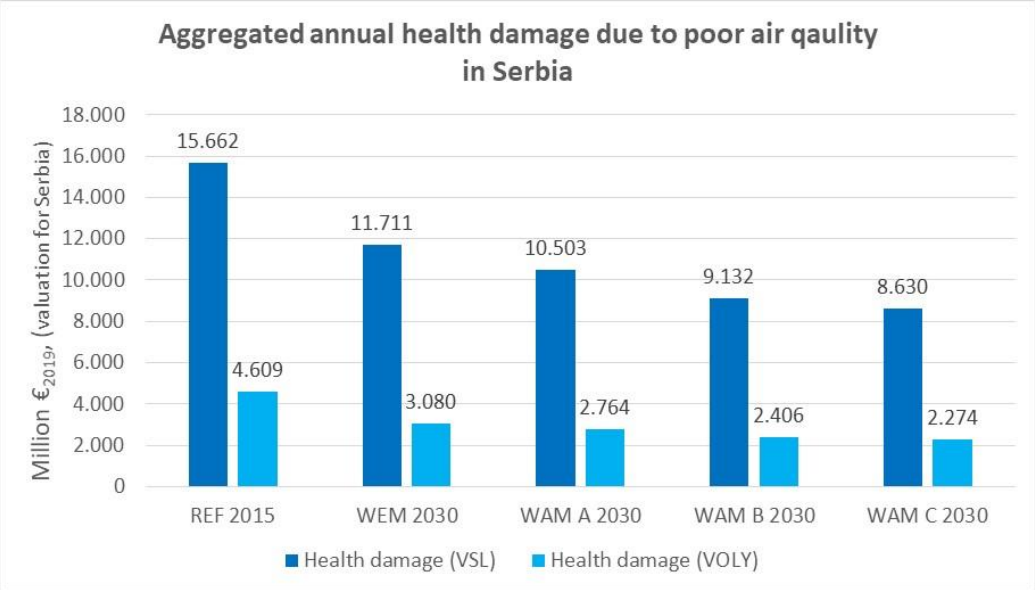


Figure 20 : Aggregated annual health damage due to poor air quality in the Republic of Serbia

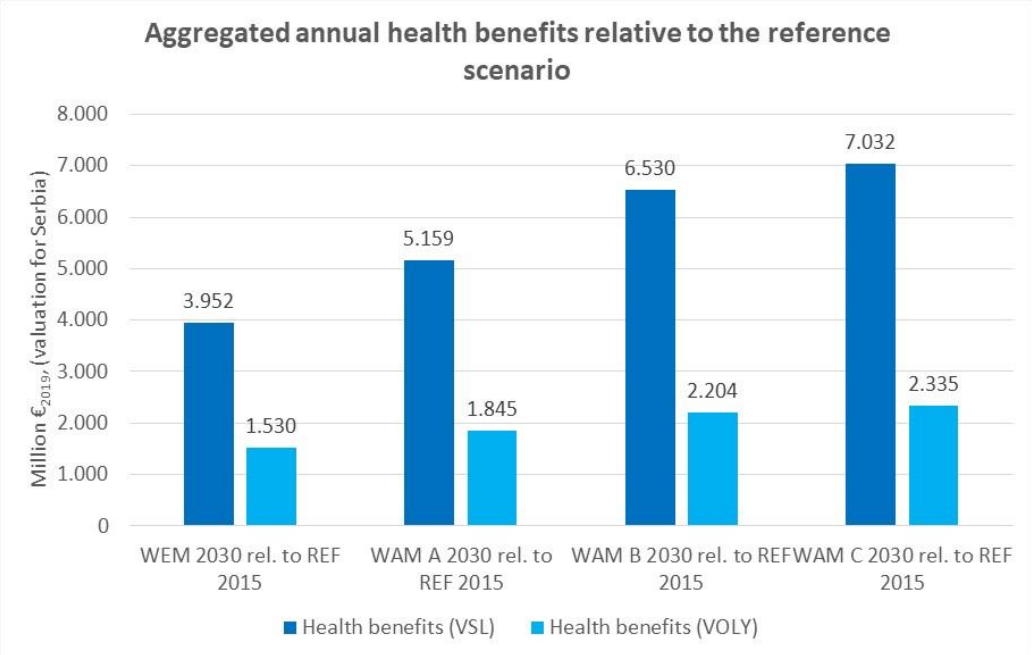


Figure 21 : Aggregated annual health benefits due implementation of different mitigation scenarios

Cost benefit assessment of the scenarios

In principle the cost benefits assessment provides guidance whether health benefits of better ambient air quality outweigh the additional investments need for implementation of policies and measures as contained in the Scenario. In order to get better perspective for the comparison of scenarios the benefits and costs of mitigation scenarios are compared with WEM scenario

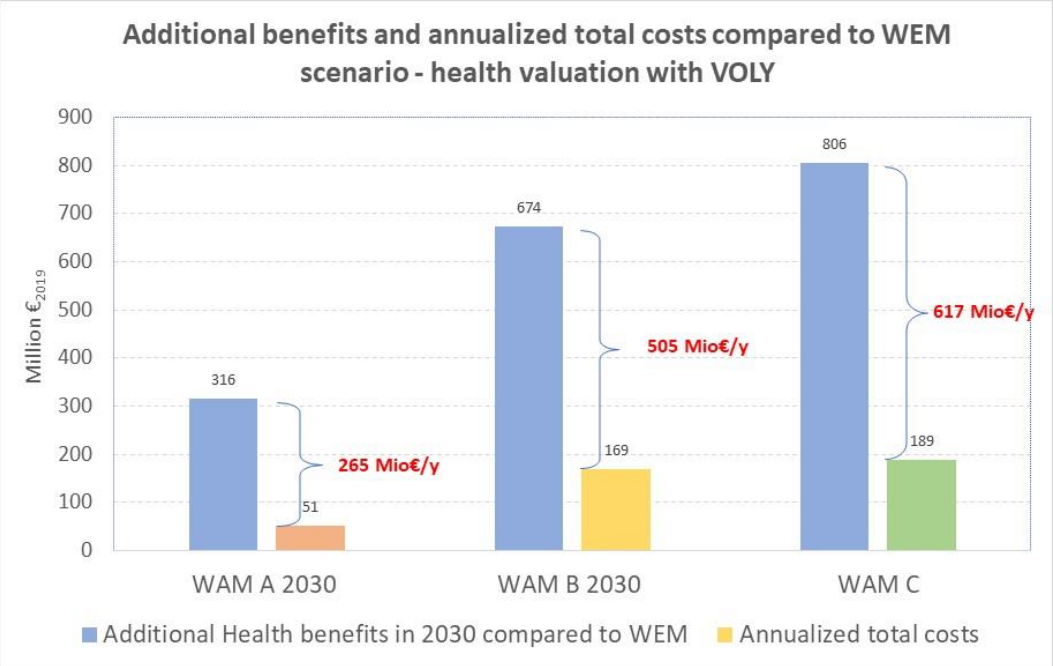


Figure 22 : Cost benefit assessment of mitigation scenarios with VOLY mortality valuation.

The cost benefit assessment of WAM A, WAM B and WAM C scenarios (Figure 22) show that for all the scenarios the health benefit are an order of magnitude higher than annualised total cost of measures included in scenarios, therefore implementation of any of the scenarios is economically sound and justifiable. The best benefits/cost ratio is for WAM A scenario 6,2, followed by WAM C scenario with ratio of 4,3 and WAM B scenario where benefit/cost ratio is 4,0. In absolute terms the WAM C scenario created the highest net benefits of 617Mio€/y, followed by WAM B scenario with 505Mio€/y and WAM A scenario with 265Mio€/y.

Environmental impacts

Air quality standards for the protection of vegetation, are defined in the EU Ambient Air Quality Directive for NO_x and SO_2 concentrations. Critical levels of respectively 30 µg.m^{-3} and 20 µg.m^{-3} for annual NO_2 and SO_2 concentrations should not be exceeded on rural measurement sites[30]. For the year 2015 in the Republic of Serbia, 5 stations were classified as rural background sites but only two did measure SO_2 concentrations and none for NO_2. For the two rural stations measuring SO_2, annual concentrations lower than 10 µg.m^{-3} were measured in 2015, and very low concentrations were simulated for the year 2030. Concerning NO_2, in 2015, 5 stations over 29 showed concentrations higher than 30 µg.m^{-3}, but all those stations were classified as traffic, urban or industrial. No peri-urban stations measured concentrations higher than 30 µg.m^{-3}. This number is reduced to 2 traffic stations in 2030 for WEM and WAM A and one for WAM B and WAM C.

Thus, although few stations measured rural background concentrations in 2015, the simulations show that critical levels for vegetation will not be exceeded in rural areas in 2030 under any scenario.

[30] Sampling points targeted at the protection of vegetation and natural ecosystems shall be sited more than 20 km away from agglomerations or more than 5 km away from other built-up areas, industrial installations or motorways or major roads with traffic counts of more than 50 000 vehicles per day (Annex III of the 2008/50 Directive).

Territory exposed to ozone exceedances of the target value for the protection of vegetation

The target value of the EU Ambient Air Quality Directive for the protection of vegetation was set to a limit on crops AOT40 of 18000 µg.m^{-3}.h^{-1}. Crops AOT40[31] is defined as the AOT40 measured or simulated at a height of 1m and accumulated over the period May to July. The number of km^2 in exceedances for the reference year and the year 2030, as calculated by the model is given in Table **5-3**. It is also expressed in % of the territory.

Table 5-3 Surface in exceedances of the AOT40 target value for vegetation in the Republic of Serbia

Surface in exceedances of the AOT40 target value in the Republic of Serbia	Ref (2015)	WEM (2030)	WAM A (2030)	WAM B (2030)	WAM C (2030)
In km^2	1.440.288	53.377	7.237	664	664
In % of the total surface	38,73%	1,44%	0,19%	0,02%	0,02%

The reduction of the area in exceedance between the reference year and the year 2030 with the WEM scenario is spectacular, since it goes from almost 40% of the territory in exceedance to less than 2%. It has mainly to do with the important reduction of NO_x (-50% compared to 2015). VOC emissions reductions also probably played a role, but this reduction is more substantial (-10%). With the most restrictive scenario on pollutant emissions (WAM C) which reduces NOx and VOC by 60% and 26% respectively compared to the reference year 2015, only 0.02% of the territory still exceeds the target value.

5.2 Stakeholder-led multicriteria analysis to support the selection of the optimum scenario for improvement of air quality in the Republic of Serbia

A stakeholder-led multicriteria analysis (MCA) was performed through an online questionnaire, which was accompanied by a technical document providing simplified information, so as to be accessible to a wide range of stakeholders, on the three with additional measures scenarios (WAM A, WAM B and WAM C) prepared in the context of the elaboration of this Programme.

The following is a summary of the key results. A detailed analysis of the results of the MCA can be found in **Error! Reference source not found.**, which is printed with this Programme and forms its integral part.

Three criteria were used, with stakeholders attributing the highest weigh (relative importance) to health (4,36 out of 5), followed by environment (4,27) and economic (4,04).

For the Environment Criterion, three questions were posed:

1) How satisfied are you with the PM10 emissions reductions achieved with scenario WAM A, WAM B and WAM C?
2) How satisfied are you with the number of exceedances of PM10 estimated in WAM A. WAM B and WAM C?

[31] AOT40 is an indication of accumulated ozone exposure, expressed in µg.m^{-3}.hours^{-1}, over a threshold of 40 ppb. It is the sum of the differences between hourly concentrations > 80 µg.m^{-3} (40 ppb) and 80 µg.m^{-3} accumulated over all hourly values measured between 08:00 and 20:00 (Central European Time).

3) How satisfied are you with the number of exceedances of any air pollutants in your city (or the one closest to you) estimated in WAM A, WAM B and WAM C?

For the Health Criterion, one question was posed:

1) How satisfied are you with the number of premature deaths associated with air pollution estimated in WAM A, WAM B and WAM C?

For the Economic Criterion, two questions were posed:

1) How satisfied are you with the additional costs estimated for the implementation of WAM A, WAM B and WAM C?
2) How satisfied are you with the net benefits (benefits-costs) estimated in WAM A, WAM B and WAM C?

For all the questions above, without exception, stakeholders showed greater satisfaction with WAM C, followed by WAM B and WAM A.

To illustrate stakeholder's preference for WAM C compared to the other scenarios, Figure 23 shows the results to the question on Satisfaction with the PM10 emissions reductions achieved in each scenario.

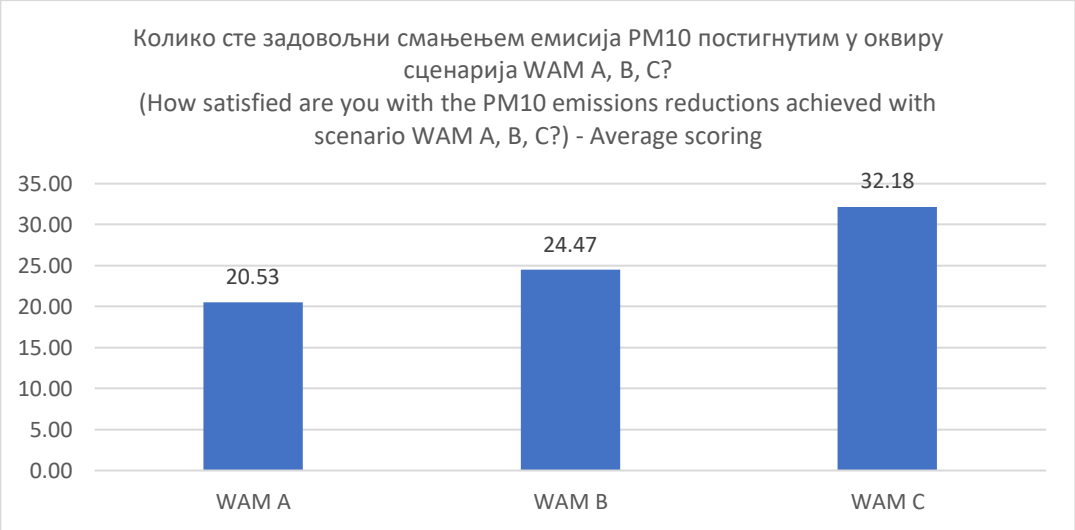


Figure 23 - How satisfied are you with the PM_{10} emissions reductions achieved with scenario WAM A, B, C? - Average scoring

The results of the stakeholder-led MCA show very clearly that stakeholders want all options to improve ambient air quality to be explored, with a view to ensuring that all Serbians enjoy improved health conditions compared to the current situation. Even when faced slightly with higher costs that will benefit cities with the poorest air quality, stakeholders showed a great sense of solidarity stating very clearly that no Serbian is to be left behind. As such, and while noting that the results of the stakeholder-led MCA are not prescriptive, they support the adoption of WAM C to fulfil the Vision of enshrined in this Programme.

6 GENERAL OBJECTIVE AND SPECIFIC OBJECTIVES

On the basis of the assessment of cost and health and environmental impacts of mitigation scenarios and inputs from the stakeholders, a WAM C scenario is recommended as cost effective and socially fair pathway to the ambient air quality vision for the Republic of Serbia.

WAM C scenario as a full control scenario has by far the greatest positive environmental impact and health benefit as well as principles follow the principles that citizens are entitled to clean air, while focusing on fine particles which have most damaging effects on human health. Furthermore, the most ambitions WAM C scenario will also have the greatest positive effects not only during the winter inversions but also during the summer heat waves when air pollution concentrations are also elevated and during which hot temperatures and air pollutants act in synergy to produce more serious health effects than expected from heat or pollution alone.

Additionally, the WAM C is ambitious to support sustainable development and clean energy production within the Republic of Serbia, and it aims to promote competitiveness through the strengthening of the national competitive profile aligned with the goals and directions in the air quality sector

Starting from these principles the general objective of this program is:

To reduce the health damage due to poor air quality by half by 2030 compared to 2015 by reducing exposure to air pollution while also enabling the Republic of Serbia to harmonize with the regulatory limitations prescribed in the European Union for air pollution, therefore limiting the damage on ecosystems.

In order to achieve general objective, the Republic of Serbia will need to significantly reduce emissions of SO_2 by 92%, NOx emissions by 60.6%, PM_{10} by 50.9 $PM_{2.5}$ by 58.3% VOC by 28.3% and NH_3 by 20,5% by 2030, compared to 2015 as presented in **Figure 24**.

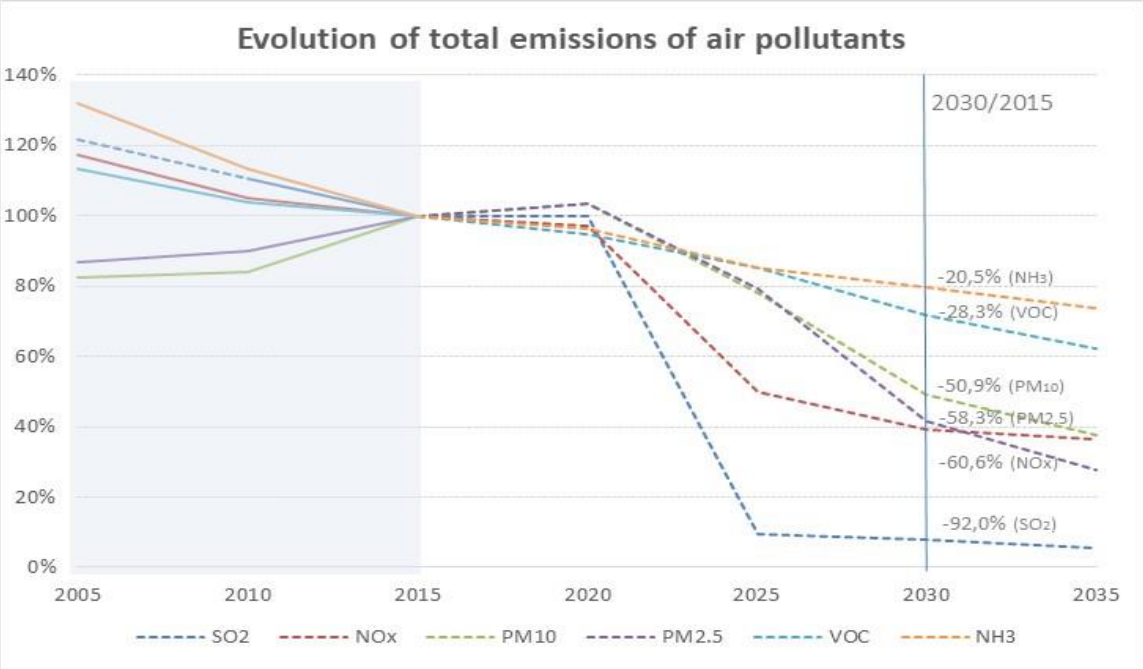


Figure 24 : Air pollutants emission targets enshrined in the general objective

Such reduction of air pollutants at the national level relay on the reduction in different economic sectors. In order to be compliant with the EU legislation and practices **specific objectives** for fulfilment of the general objective of the programme could be defined as:

Specific objective 1: Reduce emissions of SO_2 by 92% and fine particles $PM_{2.5}$ by 58.3% from Energy sector (including traffic and individual combustion) in 2030 compared to 2015

For achieving this specific objective, it is of particular importance to:

1) Reduce SO_2 emission from A_Public Power sector by 2030 by 94% and $PM_{2.5}$ by 76%
2) Reduce $PM_{2.5}$ from C_Other stationary combustion sector by 2030 by 50%
3) *Reduce $PM_{2.5}$ from F_Road Transport Sector by 2030 by 44%*

Specific objective 2: Reduce emission of air pollutants and heavy metals from Industrial processes and product use through compliance with BAT AELs

For achieving this specific objective, of particular importance is*:*

1) Enforcement of the Chapter II of the EU Directive Industrial emissions for industrial processes with consideration of the mean of upper and lower levels of BAT AELs and the lower levels for the copper production[32] and sulphuric acid production[33] in Bor.

Specific objective 3: Reduce NH3 emissions from Agriculture sector by 20.5% Compared to 2015

For achieving this specific objective, it is of particular importance to:

1) Reduce NH_3 emissions from manure management by 2030 by 9% compared to 2015
2) Reduce NH_3 emissions from animal manure applied to soils by 2030 by 31% compared to 2015

Specific objective 4: Promote transition to clean air for everyone

Activities regarding promotion are horizontal activities and will be realized, among else, through education, training for the implementation of best practices, capacity buildings and awareness raising.
List of different measures which realization will ensure fulfilment of specific and by that general objective of the Programme is developed. These measures, their effects, impacts, responsible institutions, timelines and other information ensuring monitoring and reporting of measures are described in the Action plan, in details, while basic information are provided in the following chapters of the Programme

[32] European Comission Implementing Decision 2016/1032/EU chapter 1.2 BAT Conclusions for Copper production
[33] BREF of Large Volumne Inorganic chemicals, Executive summary Table V

7 MEASURES AND THEIR ENVIRONMENTAL IMPACTS

Specific measures that ensure achievement of the Programme vision, throughout fulfilment of specific and general objective are presented in this table. This table also includes the identification of the stakeholders that have an interest in or are under the effect of the measure[34].

Table 7-1 ***Measures to achieve the goals and identification of stakeholders***

Specific Objective	Measure	Stakeholders Affected
Specific objective 1: Reduce emissions of SO_2 by 92% and fine particles $PM_{2.5}$ by 58.3% from Energy sector (including traffic and residential combustion) in 2030 compared to 2015	Enforcement of the Chapter II of the EU Directive Industrial emissions for Large Combustion Plants with consideration of the mean of upper and lower levels of BAT AELs	Public electricity and heat producers, Operators of Large industrial installations
	Enforcement of the EU Directive 2015/2193 on the limitation of emissions of certain pollutants into the air from medium combustion plants	Operators of medium sized combustion plants
	Implementation of the Regulation on emission limit values for polluting matters into the air from combustion plants in the part related to small plants with small combustion plants (capacity up to 1 MW), and which are not subject to the Eco-design Directive	Operators of small and medium enterprises
	Enforcement of minimum Euro standards for second-hand imported vehicles: Euro 5/V from 1st January 2024 and Euro 6/VI from 1st January 2025	Consumers (road vehicles owners), Road transport services providers Vehicles Imports and sales providers
	Additional vehicle fleet renewal due to financial incentives for scrapping oldest Euro 1, 2 and 3 diesel passenger cars and light duty vehicles (except N3) and for EURO I, II and III diesel busses.	Consumers (road vehicles owners), road transport service providers
	Enforcement of regulation (EU) 2016/1628 on requirements relating to gaseous and particulate pollutant emission limits and type-approval for internal combustion engines for NRMM	Suppliers of equipment, Construction companies
	Faster replacement of existing household heating appliances with new Eco-Design compliant appliances with financial	Local communities, households

[34] This information excludes the public administration (at national, provincial or local level) that have responsibility for the implementation and/or monitoring of such measures as they are conveniently identified in the action plan.

Specific Objective	Measure	Stakeholders Affected
	incentives and a higher percentage of replacement in the cities of Kragujevac, Beograd, Nis, Valjevo and Užice	
	Enforcement of the amended fuel quality Directive 2009/30/EC and Directive 2016/802/EC on the reduction of the sulphur content of certain liquid fuels	Liquid fuel producers and providers
	Limiting VOC emissions by implementing the requirements of VOC Petrol Directives 94/63/EC (Stage I) and 2009/126/EC (Stage II) collecting petrol vapours from the storage and transport of petrol and refuelling motor vehicles at petrol stations	Petrol storage and distribution infrastructure, petrol transportation companies and stations
Specific objective 2: Reduce emission of air pollutants and heavy metals from Industrial processes and product use through compliance with BAT AELs	Enforcement of the Chapter II of the EU Directive Industrial emissions for industrial processes with consideration of the mean of upper and lower levels of BAT AELs and the lower levels copper production and sulphuric acid production in Bor	Copper smelting company
	Enforcement of the IED Chapter V, Annex VII for VOC or chapter 2 for plants with a consumption of solvents larger than 200 t per year or 150 kg per hour	Companies performing surface treatment of substances, objects or products using organic solvents, in particular for dressing, printing, coating, degreasing, waterproofing, sizing, painting, cleaning or impregnating,
Specific objective 3: Reduce NH3 emissions from Agriculture sector in 2030 by 20.5% Compared to 2015	Implementation of best practices for slurry storage	Operators of Pigs and cattle farms eligible for IPCC permit
	Substitution of Urea with ammonium nitrate fertilizer	Farmers and Agricultural land owners
	Introduction of the best practices at spreading for solid manure application by faster incorporation of manure in the soil	Operators of Pig and Poultry farms
	Introduction of best practices at spreading for pig and cattle slurry	Agricultural land owners
	Limitation of the burning of agricultural residues (0% in 2030)	Farmers and Agricultural land owners
Specific objective 4: Promote transition to clean air for everyone	Education on air quality, training for implementation of best practices and awareness raising.	Universities; schools; adult training centres; local communities, households,

Specific Objective	Measure	Stakeholders Affected
		companies; workers, in particular in the value chain of the sectors with the greatest impact on air quality.

Regarding the environmental impact of specific PaMs the highest contribution to the achievement of Specific objective 1 has by far Financial incentives for faster replacement of existing domestic heating appliances with Eco-design compliant and heat pumps with larger share of replacement in the cities of Kragujevac, Beograd, Nis, Valjevo and Užice, which will contribute 63,9% to the $PM_{2.5}$ and as much as 90,6% to the PM_{10} part of the general objective. This measure is followed by the limitation of the burning of agriculture residues on agriculture lands which contribute 30,8% to the $PM_{2.5}$ related general objective. Enforcement of minimum standards for second-hand vehicles will contribute 63,5% of total necessary NOx[35] emission reductions.

Specific objective 2 is targeting the Industrial processes and product use. The Enforcement of the Chapter II of the EU Directive Industrial emissions for industrial processes with consideration of the mean of upper and lower levels of BAT AELs[36] and the lower levels for the plants of copper production and sulphuric acid production in Bor is contributing 31,9% to the total SO_2 emission reductions and 15,4% of the NO_X reduction. It has to be noted that in WAM C scenario this measure is among others also targeting achieving emission limit values for particulate matter[37] and SO2from copper smelting activities in Bor, in order to ensure the compliance of the ambient air in Bor with the limit values prescribed by the Air quality directive 2008/50/EC on sulphur dioxide and with target values for arsenic, cadmium, nickel and benzo(a)pyrene in accordance with Directive 2004/107/EU on arsenic, cadmium, mercury, nickel and polycyclic aromatic hydrocarbons in ambient air.

Measures in specific objective 3 are targeting primarily NH3 emissions, where by far the most important measure is the substitution of urea with ammonium nitrate fertilizer, contributing 51,1% toward the total NH_3 emission reductions followed by Introduction of best practices at spreading for pig and cattle slurry with 15,6% and Introduction of the best practices at spreading for solid manure application by incorporating the manure in the soil faster with 5.9%.

Detail environmental impacts of measures are presents in Table **7-2** below.

[35] NO_x is together with SO_2, VOC and NH_3 a precursor pollutant for $PM_{2.5}$ formation

[36] The exact deviation from the mean of upper and lower levels of BAT AELs needs to be assessed at the level of individual installation taking into account the contribution of the installation (considering both primary and secondary emissions) to air quality and exceedances of particular air pollutant in zones and agglomerations.

[37] Comission Implementing Decision 2016/1032/EU in the chapter 1.2 BAT Conclusions for Copper production is limiting heay metals through BAT-associated emission levels for dust emissions to air from copper production

Table 7-2 Environmental impacts of the measure per pollutant and measure

No.	Measure	Pollutant and its environmental impacts [%]					
		NOx	SO2	VOC	PM10	PM2,5	NH3
1	Enforcement of the Chapter II of the EU Directive Industrial emissions for Large Combustion Plants with consideration of the mean of upper and lower levels of BAT AELs	4,5%	6,6%		0,3%	0,1%	
2	Enforcement of the EU Directive 2015/20193 Medium Combustion plants	0,9%	54,5%		1,8%	1,5%	
3	Implementation of the Regulation on emission limit values for polluting particles into the air from combustion plants (Official Gazette of RS, No. 6/16 and, 67/21) in the part related to small plants with small combustion plants (capacity up to 1 MW), and which are not subject to the Eco-design Directive	2,2%			0,0%	0,0%	
4	Enforcement of minimum Euro standards for second-hand vehicles imported: Euro 5/V from 1st January 2024 and Euro 6/VI from 1st January 2025	56,5%		4,7%	0,6%	0,6%	0,1%
5	Additional vehicle fleet renewal due to financial incentives for scrapping oldest Euro 1, 2 and 3 diesel passenger cars and light duty vehicles and for EURO I, II and III diesel busses.	1,4%		0,1%	0,1%	0,1%	0,0%
6	Enforcement of regulation (EU) 2016/1628 on requirements relating to gaseous and particulate pollutant emission limits and type-approval for internal combustion engines for non-road mobile machinery	7,1%		0,5%	0,3%	0,3%	
7	Additional the replacement of existing domestic heating appliances with new appliances Eco-Design compliant and heat pumps due to financial incentives, with larger share of replacement in the cities of Kragujevac, Beograd, Nis, Valjevo and Užice	-4,2%	0,5%	49,7%	62,8%	64,0%	2,4%
8	Enforcement of the amended fuel quality Directive 2009/30/EC and Directive 2016/802/EC on the reduction of the sulphur content of certain liquid fuels		2,7%				
9	Limiting VOC emissions by implementing the requirements of VOC Petrol Directives 94/63/EC (Stage I) and 2009/126/EC (Stage II) collecting petrol vapours from the storage and transport of petrol and refuelling motor vehicles at petrol stations			3,0%			
10	Enforcement of the Chapter II of the EU Directive Industrial emissions for industrial processes with consideration of the mean of upper and lower levels of BAT AELs and the lower levels for the plants of copper production and sulphuric acid production in Bor	15,4%	31,9%	0,6%	3,6%	2,6%	0,1%
11	Enforcement of the IED Chapter V, Annex VII for VOC or chapter 2 for plants with a consumption of solvents larger than 200 t per year or 150 kg per hour			19,0%			
12	Implementation of best practices for slurry storage						0,3%
13	Substitution of Urea with ammonium fertilizers						51,1%
14	Introduction of the best practices at spreading for solid manure application by faster incorporation the manure in the soil						5,9%
15	Introduction of best practices at spreading for pig and cattle slurry						15,6%
16	Limitation of the open burning of agricultural residues on agriculture land (0% in 2030)	16,3%	3,7%	22,4%	30,5%	30,8%	24,5%
	Total	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%

7.2 Measures with descriptions, pollutants affected, emission savings and implementing entities and partners

Table 7-3 below contains list of measures included in WAM C scenario with information on the type of measures, description of measure, short textual description of the main elements or conceptual approach of the measure including important milestones (expected timing for implementation of the measure), additional objectives to which the measure contributes and Chapter of the EU accession negotiation process under which specific measure is allocate. Each measure also contains the information on key implementing entity, implementation partners, main air pollutants affected and emission reduction potential of the measure by 2025, 2030 and 2035 together with indicator on cost-effectiveness of the measure attributed to one of the main air pollutants.

Table 7-3: **List of measures with main descriptions, pollutants affected, emission savings and implementing entities**

Specific objective 1: Reduce emissions of SO_2 by 92% and fine particles $PM_{2.5}$ by 58.3% from Energy sector (including traffic and individual combustion) in 2030 compared to 2015	
WAM-B1	Name of measure/policy: **Enforcement of the Chapter II of the EU Directive Industrial emissions for Large Combustion Plants with consideration of the mean of upper and lower levels of BAT AELs**
1	**Type of the measure:** Regulatory **Description of the measure:** This measure consists in the enforcement of the directive 2010/75/EU on industrial emissions and especially its chapter II for large combustion plants except NERP installations. Chapter II of the industrial emissions Directive requires an integrated environmental approach to the regulation of certain industrial activities. This means that emissions to air, water (including discharges to sewer) and land, plus a range of other environmental effects, must be considered together. The permit conditions have to be set up in order to achieve a high level of protection for the environment as a whole, based on the use of the best available techniques (BAT). The chapter II of IED requires compliance with BAT AELs. These BAT AELs are defined in a series of BAT Conclusion Decisions implemented by the European Union. When the permit is granted for a plant, the imposed ELVs must be set up to ensure that the emissions of the plant will remain in the range of the BAT AELs. This measure considers that for Large Combustion Plants (LCPs), the ELVs implemented enable the LCPs to comply with the average value between the upper and the lower values of BAT AELs. The exact deviation from the mean of upper and lower levels of BAT AELs needs to be assessed at the level of individual installation taking into account the contribution of the installation (considering both primary and secondary emissions) to air quality and exceedances of particular air pollutant in zones and agglomerations. The recently published Commission Implementing Decision (EU) 2017/1442 of 31 July 2017 establishing best available techniques (BAT) conclusions, under Directive 2010/75/EU of the European Parliament and of the Council, for large combustion plants applies. The national "Regulation on limit values of emissions of air pollutants from stationary pollution sources, excluding combustion plants and national "Regulation on emission limit values of pollutants in the air from combustion plants, were considered in the scenario WEM. In the scenarios WAM A , WAM B and WAM C, the IED impacts the reduction of emissions when the emission limit values (ELVs) are stricter than the existing national ELVs. This measure does not include combustion plants from the NERP. Monitoring of this measure is to be conducted through SEPA as responsible for data collection for the National Register of Polluters and issues environmental performance reports. **EU related objective:** Energy Supply: efficiency improvement in the energy and transformation sectors

	Energy Consumption: efficiency improvement in industrial end-use sectors Industrial processes: installation of abatement technologies ***<u>Additional effects of the measure:</u>*** Reduction of total emissions of the Republic of Serbia to comply with EU directive 2284/2016 Improvement of air quality in the Republic of Serbia to avoid exceedances of air quality limit values **<u>EU Accession Negotiation Process: Chapter 27 – Environment</u>**						
	Key Implementing entity	**Implementation partners**	**Main air pollutants affected**	**Cost effectiveness [€/kg (air pollutant)]**	**Absolute emission avoided 2025, 2030, 2035**		
					[kt [air pollutant]]		
	MoEP	Provincial Secretariat for Construction and Environmental Protection and local self-government units Competences for issuance of the integrated permits SEPA	NOx	3,8	0,67	0,68	0,85
			SO_2	1,3	0,59	0,60	0,43
			PM_{10}	PM are reduced through DeSOx implementation	0,09	0,04	0,06
			$PM_{2,5}$	PM are reduced through DeSOx implementation	0,04	0,04	0,03
WA MA2.	Name of measure/policy**: <u>Enforcement of the EU Directive 2015/2193 on the limitation of emissions of certain pollutants into the air from medium combustion plants</u>**						
2	**<u>Type of the measure</u>:** Regulatory						

Description of the measure:

This measure considers the enforcement of the Directive (EU) 2015/2193 of the European Parliament and of the Council of 25 November 2015 on the limitation of emissions of certain pollutants into the air from medium combustion plants (MCPD) with a thermal power from 1 to 50 MW. The MCPD is not yet fully transposed in the national legislation. The dates of compliance with emission limit values (ELVs) are as follows:

1) Combustion plants with a thermal power from 5 to 50 MW must comply with ELVs from 2025.
2) Combustion plants with a thermal power from 1 to 5 MW must comply with ELVs from 2030.

A national regulation on emission limit values of pollutants in the air from combustion plants already introduced ELVs for plants in this range of thermal power (The enforcement of the national regulation on emission limit values of pollutants in the air from combustion plants ("Official Gazette of the Republic of Serbia", No. 6/16 and 67/21) has been considered in the With Exiting Measures scenario (WEM).

The MPCD may implement stricter ELVs for some pollutants and for some ranges of thermal power than the national regulation. ELVs are stricter in MCPD for existing plants for SO_2 and PM in case of solid fuels, for SOx in case of liquid fuels and gaseous fuels other than natural gas. However, the national existing Regulation prescribes ELVs that are more stringent for NOx for all plants with liquid fuels other than gas oil, for plants between 1 and 5 MW with natural gas and for plants larger than 5 MW with gaseous fuels other than natural gas.

ELVs for SO_2 and NOx are stricter in MCPD for new plants using solid fuels, and for SOx, NOx and PM for all liquid fuels and gaseous fuels other than natural gas.

Also, according to MCPD, only new plants become objects of aggregation, while in national Regulation all plants become objects of aggregation. Finally, MCPD does not prescribe ELVs for CO, N_2O and Total Organic Carbon (TOC), as is the case with the national Regulation.

The MCPD will have impacts on SO_2, NOx and PM emissions, when it prescribes limit values stricter than the existing national regulation on emission limit values of pollutants in the air from combustion plants ("Official Gazette of the Republic of Serbia", No. 6/16 and 67/21)

EU related objective:

Energy Consumption: efficiency improvement in industrial end-use sectors
Energy Consumption: efficiency improvement in services/tertiary sector
Energy Consumption: efficiency improvement in buildings
Industrial processes: installation of abatement technologies

Additional effects of the measure:

Reduction of total emissions of the Republic of Serbia to comply with EU directive 2284/2016
Improvement of air quality in the Republic of Serbia to avoid exceedances of air quality limit values

EU Accession Negotiation Process: Chapter 27 – Environment]

Key Implementing entity	Implementation partners	Main air pollutants affected	Cost effectiveness [€/kg (air pollutant)]	Absolute emission avoided 2025, 2030, 2035 [kt [air pollutant]]		
MoEP	Ministry of Mining and Energy SEPA Provincial Secretariat for Construction and Environmental Protection and local self-government units	NOx	2,7	0,09	0,15	0,16
		SO_2	1,1	4,64	4,99	4,34
		PM_{10}	1,9	0,18	0,47	0,48
		$PM_{2,5}$		0,16	0,39	0,40

WA M A3	Name of measure/policy: **Enforcement of limit values for smallest combustion plants (lower than 1 MW) of the national regulation on emission limit values of pollutants in the air from combustion plants**
3	**Type of the measure:** Regulatory **Description of the measure:** This measure considers the enforcement of the limit values from the Regulation on limit values of emissions of pollutants into the air from combustion plants for combustion plants with a rated thermal capacity lower than 1 MW using solid fuels, liquid fuels or natural gas. Combustion plants from 1 to 5 MW using liquid fuels and from 1 to 10 MW using natural gas, considered as small combustion plants in the current national regulation are now subject of the MCPD (Measure No.2)). These combustion plants are subject to construction permit mainly. All combustion small plants are assumed to be compliant with emission limit values from 2025. **EU related objective:** : Energy Consumption: efficiency improvement in industrial end-use sectors Energy Consumption: efficiency improvement in services/tertiary sector Energy Consumption: efficiency improvement in buildings Industrial processes: installation of abatement technologies ***Additional effects of the measure:*** *Reduction of total emissions of the Republic of Serbia to comply with EU directive 2284/2016*

	Improvement of air quality in the Republic of Serbia to avoid exceedances of air quality limit values **EU Accession Negotiation Process: Chapter 27 – Environment**						
	Key Implementing entity	**Implementation partners**	**Main air pollutants affected**	**Cost effectiveness [€/kg (air pollutant)]**	**Absolute emission avoided 2025, 2030, 2035**		
					[kt [air pollutant]]		
	MoEP	Ministry of Mining and Energy, SEPA, Provincial Secretariat for Construction and Environmental Protection and local self-government units	NOx	0,8	0,36	0,33	0,31
			PM_{10}	7,8	0,01	0,01	0,02
			$PM_{2,5}$		0,01	0,01	0,01
WAM B4	Name of measure/policy: **Enforcement of minimum Euro standards for second-hand imported vehicles: Euro 5/V from 1st January 2024 and Euro 6/VI from 1st January 2025**						
4	**Type of the measure:** Regulatory **Description of the measure:** The measure aims at reducing emissions of pollutants from road traffic (predominantly NOx and PM) by improvement of the characteristics of the fleet of vehicles. It considers that minimum standards are imposed to second-hand vehicles imported: Euro 5 for passenger cars and cargo vehicles (except N3) and Euro V for heavy duty vehicles and busses from 1st January 2024 Euro 6 for passenger cars and cargo vehicles (except N3) and Euro VI for heavy duty vehicles and busses from 1st January 2025 **EU related objective:** Transports - efficiency improvement of vehicles ***Additional effects of the measure:*** Reduction of total emissions of the Republic of Serbia to comply with EU directive 2284/2016 Improvement of air quality in the Republic of Serbia to avoid exceedances of air quality limit values						

EU Accession Negotiation Process: Chapter 27 – Environment

Key Implementing entity	Implementation partners	Main air pollutants affected	Cost effectiveness [€/kg (air pollutant)]	Absolute emission avoided 2025, 2030, 2035 [kt [air pollutant]]		
Ministry of Internal and Foreign Trade	Ministry of Construction, Transport and Infrastructure (hereinafter: MoCTI) Road Traffic Safety Agency (RTSA), MoEP, Ministry of Finance	NOx	12,0	3,03	8,65	4,80
		PM_{10}		0,06	0,15	0,06
		$PM_{2.5}$		0,06	0,15	0,06
		VOC		0,47	1,03	0,73

WAM B5 Name of measure/policy: **Additional vehicle fleet renewal due to financial incentives for scrapping oldest Euro 1, 2 and 3 diesel passenger cars and cargo vehicles (except N3) and for EURO I, II and III diesel busses.**

5

Type of the measure: Financial

Description of a measure:

The measure aims at reducing emissions, especially PM, from road traffic by eliminating the oldest vehicles which complies with significantly lover environmental standards. The measure focusses on the old diesel vehicles such as:

passenger cars and cargo (except N3) Euro 1, Euro 2 and Euro 3 vehicles and Euro I, Euro II and Euro III diesel busses

The measure considers that financial incentives will enable the scrapping of the oldest vehicles in the vehicle fleet. The target number of vehicles removed through the scrapping programme, is as follows:

	2025	2026
Diesel Passenger cars	107.600	16.300
Diesel cargo vehicles (except N3)	12.800	1.200
Diesel buses	1.900	400
Total	**122.300**	**17.900**

The financial incentives represent 35 % of the costs of second hand Euro 6 or EURO VI vehicles. This measure is associated to the measure No 4.

The proposed financial incentives are as follows:

Diesel passenger car: 2100 €
Cargo diesel vehicles (except N3): 2500 €
Busses: 2900 €

In order to implement the measure, it is necessary to establish a mechanism that will define the steps that are necessary in order to realize support from public funds for the deregistration/shipping of old diesel passenger cars, cargo vehicles (except N3) and buses (corresponding to Euro 1, Euro 2, Euro 3 and Euro I, Euro II and Euro III) to recycling centres.

The Agency for Traffic Safety proposes a support mechanism from public funds for the deregistration/shipping of old diesel passenger cars, cargo vehicles (except N3) and buses (corresponding to Euro 1, Euro 2, Euro 3 and Euro I, Euro II and Euro III) to recycling centres, while the partners in the realization of the mechanisms are the MoCTi and the MoEP.

For the next step, that is, the implementation of support mechanisms from public funds for the deregistration/shipping of old diesel passenger cars, cargo vehicles (except N3) and buses (corresponding to Euro 1, Euro 2, Euro 3 and Euro I, Euro II and Euro III) in the competent authority for recycling centers is the MoCTI, while the partners in implementation of activities are the Ministry of Environmental Protection and the Agency for Traffic Safety.

EU related objective:
Transports - efficiency improvement of vehicles

Additional effects of the measure:
Reduction of total emissions of Serbia to comply with EU directive 2284/2016
Improvement of air quality in Serbia to avoid exceedances of air quality limit values

EU Accession Negotiation Process: Chapter 27 – Environment

Key Implementing entity	Implementation partners	Main air pollutants affected	Cost effectiveness [€/kg (air pollutant)]	Absolute emission avoided 2025, 2030, 2035 [kt [air pollutant]]		
Ministry of Finance	Road Traffic Safety Agency (RTSA),	NOx	33,0	0,852	0,215	0,059

		MoCTI MoEP Recyclers association of Serbia	PM_{10}		0,060	0,016	0,004
			$PM_{2.5}$		0,058	0,015	0,004
			VOC		0,050	0,014	0,004
			NH_3		-0,004	-0,001	0,000
WAM A6	Name of measure/policy: **Enforcement of regulation (EU) 2016/1628 on requirements relating to gaseous and particulate pollutant emission limits and type-approval for internal combustion engines for non-road mobile machinery**						
6	**Type of the measure:** Regulatory **Description of a measure:** This measure is the enforcement of limit values for main pollutants of the EU Directive 2016/1628 for new non road mobile machineries (NRMM). There is a large variety of non-road mobile machinery included in the scope of the legislation. It covers among other: ➢ Construction machinery (e.g. excavators and bulldozers) ➢ Agricultural machinery (e.g. self-propelled sprayers and harvesting equipment) ➢ Material handling machinery (e.g. cranes and industrial trucks) ➢ Garden machinery (e.g. lawnmowers and hedge trimmers) ➢ Municipal equipment (e.g. road sweepers and winter maintenance equipment) ➢ Mobile generator sets ➢ Engines in vessels... The impact of the measure is taken in account for construction machinery and agriculture machinery. **EU related objective:** Transport: efficiency of vehicles ***Additional effects of the measure:*** *Reduction of total emissions of the Republic of Serbia to comply with EU directive 2284/2016* *Improvement of air quality in the Republic of Serbia to avoid exceedances of air quality limit values* **EU Accession Negotiation Process: Chapter 27, environment**						
	Key Implementing entity	**Implementation partners**		**Cost effectivene**	**Absolute emission avoided 2025, 2030, 2035**		

			Main air pollutants affected	ss [€/kg (air pollutant)]	[kt [air pollutant]]		
	MoCTI	Road Traffic Safety Agency (RTSA),	NOx	2,5	0,213	1,083	1,780
			PM_{10}		0,013	0,076	0,125
			$PM_{2.5}$		0,013	0,076	0,125
			VOC		0,021	0,107	0,176
WAM C1	Name of measure/policy: **Additional the replacement of existing domestic heating appliances with new appliances Eco-Design compliant and heat pumps due to financial incentives, with larger share of replacement in the cities of Kragujevac, Beograd, Nis, Valjevo and Užice**						
7	**Type of the measure:** Regulatory, Financial **Description of a measure:** This measure considers the enforcement of the EU Eco-design Directive and its two associated regulations 2015/1185 and 2015/1189: • Regulation 2015/1189 of 28 April 2015 implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to Eco-design requirements for solid fuel boilers. • Regulation 2015/1185 of 24 April 2015 implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to Eco-design requirements for solid fuel local space heaters Compared to the natural rate of replacement of 5% per year, the rate is at least doubled with the financial incentives from 2026. New appliances put on the market must satisfy the requirements of the two regulations implementing emission limit values for a set of pollutants (PM, NOx, VOC) and energy efficiency parameters for new appliances. Consequently, new appliances produced or imported in Serbia must at minimum be compliant with the new limit values. These limit values are controlled at the level of the production process, not on sites where they are used. The measure assumes that all the necessary amendments to existing regulations are in place before 2024, in order to enable this replacement from 2024. The measure considers that financial incentives will enable a faster replacement of domestic heating appliances using solid fuels. Public financial support is developed for ensuring a faster replacement of old appliances in the whole Serbia. Moreover, a specific emphasis is given to 5 cities to accelerate the changes compared to rest of Serbia, in order to ensure compliance with PM_{10} and $PM_{2.5}$ air quality limit values in 2030. In these five cities, the level of PM emission reduction must be larger than in the rest Serbia. The reductions of PM necessary to ensure the compliance with air quality limit values are as follows, compared to 2015 emissions: Beograd: -56%; Kragujevac: -54%; Niš: -73%; Valjevo: -73%; Užice: -81%; Rest of the territory: -46%						

	Since such reductions in the agglomerations listed above cannot be achieved with natural substitution of appliances using coal and firewood, the planned incentives should achieve the following substitution. The measure considers a larger penetration of pellet appliances in the five agglomerations/cities with most severe air quality issues and the use of heat pumps not emitting directly PM in Nis, Valjevo and Užice. In Kragujevac at least 58% of the appliances shall be replaced with Eco-label appliances of which at least 25% of pellet appliances In Belgrade at least 58% of the appliances shall be replaced by only pellet appliances In Valjevo and Nis at least 74% of the appliances shall be replaced by up to 50% of pellet appliances and 50% or more of heat pumps and In Užice at least 80% of appliances shall be replaced by 85% or more of heat pumps and up to 15% with pellet appliances The above mentioned levels present are minimum levels of replacement rates where pellet appliances can be switch for even cleaner technologies, if additional funding is available. The level of financial subsidies is as follows: 50 % in the whole territory of Serbia excepted Beograd, Kragujevac, Nis, Valjevo and Užice where subsidies at the level of of 80% of investment are considered (100% of support to be considered for socio-economically most vulnerable applicants). In absolute values the following support is considered for the WAM C scenario. 1) Local space heaters that use wood, meet the Eco-design requirements and have the Serbian mark of conformity: EUR 240–380; Local space heaters that use pellet, meet the Eco-design requirements and have the Serbian mark of conformity: EUR 400–640. Heat pump (simple heat pump for heating and cooling, plus LPG stove) replacing a firewood stove: EUR 440–700. 2) Solid fuel boiler that meets the Eco-design requirements and has the Serbian mark of conformity: EUR 800–1300; Pellet boiler, that meets the Eco-design requirements and has the Serbian mark of conformity: EUR 1200–1900, 3) Heat pump (heat pump for heating and cooling) replacing a solid fuels boiler: from 1860 € up to 3000 € The document does not consider subsidies for coal-fired stoves conformant to the Ecodesign Directive, nor other coal-fired appliances or coal-fired boilers.In order to contribute to the general objective of M2 climate change scenario, no subsideis are considered for Eco-labeled coal stoves or other coal appliances or boilers. The target replacement rate of 10% per year in the period from 2026 to 2030 (compared to the natural rate of 5%) is projected to be lower in the period 2024 and 2025 (2% and 4%) due to low availability of appliances that meet the requirements of the Ecodesign Directive at the beginning of that period. After 2030, the natural rate of replacement is considered. It is expected that the application of this measure in Serbia by 2030 will contribute to replacement of 57% of devices on solid biomass and coal (726,500 devices on wood (76,800 in Belgrade, 16,600 in Kragujevac, 15,400 in Valjevo, 30,650 in Niš, 13,600 in Uzice, and the rest in other parts of Serbia), as well as 156,800 coal-fired appliances, or 82% of such appliances by 2035. Annex 5, which is printed with this Programme and forms its integral part, provides a Table on the expected introduction of new appliances that meet the requirements of the Ecodesign Directive.

For implementation of this support measure additional six Full Time Employees (FTE) is estimated to be needed.

EU related objective:
Energy Consumption: efficiency improvement in buildings

Additional effects of the measure:
Reduction of pollutant emissions especially PM_{10} and $PM_{2.5}$.
Crucial measures to reduce emissions of PM and improve air quality in terms of PM concentrations

EU Accession Negotiation Process: Chapter 27 – Environment

Key Implementing entity	Implementation partners	Main air pollutants affected	Cost effectiveness [€/kg (air pollutant)]	Absolute emission avoided 2025, 2030, 2035 [kt [air pollutant]]		
Ministry of Mining and Energy	Ministry of Finance MoEP Cities of Kragujevac, Beograd, Nis, Valjevo and Užice Conformity Assessment Bodies (CABs)	PM_{10}	2,1	1,780	16,480	23,653
		$PM_{2.5}$		1,734	16,048	23,028
		VOC		0,393	10,861	15,505
		NOx		-0,059	-0,641	-0,933
		SO_2		0,008	0,050	0,053
		NH_3		0,008	0,050	0,053

WA MA7	Name of measure/policy: **Enforcement of the amended fuel quality Directive 2009/30/EC and Directive 2016/802/EC on the reduction of the sulphur content of certain liquid fuels**
8	**Type of the measure:** Regulatory **Description of a measure:**

The Directive (EU) 2016/802 of the European Parliament and of the Council of 11 May 2016 relating to a reduction in the Sulphur content of certain liquid fuels introduces the maximum content of Sulphur for certain fuels: heavy fuel oil: 1%; gas oil: 0,1%; marine fuels: 0,5%; marine fuels used at berth: 0,1%.
The Directive 2009/30/EC of the European Parliament and of the Council of 23 April 2009 amending Directive 98/70/EC as regards the specification of petrol, diesel and gas-oil and introducing a mechanism to monitor and reduce greenhouse gas emissions and amending Council Directive 1999/32/EC as regards the specification of fuel used by inland waterway vessels and repealing Directive 93/12/EEC, applies to petrol, diesel and biofuels used in road transport and gasoil used in NRMM. Sulphur content in fuels for mobile non-road vehicles (including mobile machinery, agricultural and forestry tractors, as well as inland waterway vessels and recreational crafts) was limited to 1000 ppm from 2008, and 10 ppm from 2011.
The measure considers the limitation of S concentrations in fuels used in the non-road mobile machineries used in construction and industry, in agriculture and forestry and in vessels. The reduction of the Sulphur content of heavy fuel is considered in industry and LCPs but it has to be reminded that the limit values implemented with the IED and MCPD are stricter than what the fuel with 1 % S can bring.
For stationary combustion full compliance is considered from the beginning of 2021. (completion of the investment in refinery NIS) while fuels with sulphur content less than 0,5% will be available for vessels by 2025.
Marine fuels for inland navigation are already in line with the requirements of Directive 98/70 prescribing conditions for this type of fuel. It is still necessary to prescribe the quality and production of marine fuels used exclusively for navigation at sea. Given that Serbia is a landlocked country, after the development of the Specific Plan for the implementation of Directive 2016/802, it was concluded that there was a need of prescribing the quality of marine fuel, as well as adopting standards, by accreditation of methods and procurement of equipment for marine fuels for their monitoring, which is planned for 2025.

EU related objective:
8: other: improvement of the fuel quality

Additional effects of the measure:
Reduction of total SO_2 emissions of the Republic of Serbia to comply with EU directive 2284/2016
Contribute to the improvement of air quality in the Republic of Serbia

EU Accession Negotiation Process: Chapter 27 – Environment

Key Implementing entity	Implementation partners	Main air pollutants affected	Cost effectivene	Absolute emission avoided 2025, 2030, 2035
				[kt [air pollutant]]

				ss [€/kg (air pollutant)]			
	Ministry of Mining and Energy	MoCTI (Sector for Water Transport and Safety of Navigation) Ministry of Finance MoEP Ministry of Internal and Foreign Trade	SO_2	0,2	0,24	0,24	0,26
WA M A8	Name of measure/policy: **Limiting VOC emissions by implementing the requirements of VOC Petrol Directives 94/63/EC (Stage I) and 2009/126/EC (Stage II) collecting petrol vapours from the storage and transport of petrol and refuelling motor vehicles at petrol stations**						
9	**Type of the measure:** Regulatory **Description of a measure:** The measure aims at limiting VOC emissions from all the petrol distribution from the terminals, the intermediate stationary tanks and petrol stations by implementing the requirements of Directive 94/63/EC on the control of volatile organic compound (VOC) emissions resulting from the storage of petrol and its distribution from terminals to service stations (VOC Petrol Stage I) and Directive 2009/126/EC on Stage II petrol vapour recovery during refuelling of motor vehicles at service stations (VOC Petrol Stage II). The emissions of VOC are limited at terminal by several means such as tanks with external floating roofs with primary and secondary seals and loading and unloading equipment are designed to reduce the total annual losses of VOC as required by the EU directive 94/63/EC. The displaced vapours are returned through a vapour tight connection line to a vapour recovery unit for regeneration at the terminal. Mobile containers are designed and operated to remain vapours returned from storage installations. At the service station level, the loading and storage equipment are designed to reduce VOC losses as required by the EU directive 94/63/EC. The stage II petrol vapour recovery involves recovering the petrol vapour displaced from the fuel tank of a vehicle during refuelling and transferring that petrol vapour to the underground storage. The minimum efficiencies to be achieved are provided by the two directives. It has been considered the full petrol distribution chain will be compliant with the requirement of the two directives in 2028 as described in the DSIP for the implementation of the two directives (version August 2021). **EU related objective:** 8 Other: limit fugitive VOC emissions from the petrol distribution						

Additional effects of the measure:
Reduction of total VOC emissions of the Republic of Serbia to comply with EU directive 2284/2016
Contribute to the improvement of air quality in the Republic of Serbia

EU Accession Negotiation Process: Chapter 27 – Environment

Key Implementing entity	Implementation partners	Main air pollutants affected	Cost effectiveness [€/kg (air pollutant)]	Absolute emission avoided 2025, 2030, 2035 [kt [air pollutant]]		
MoEP	Ministry Mining and Energy, SEPA	VOC	9,4	0,118	0,657	0,568

Specific objective 2: Reduce emission of air pollutants and heavy metals from Industrial processes and product use through compliance with BAT AELs	
WAM C2	Name of measure/policy: **Enforcement of the Chapter II of the EU Directive Industrial emissions for industrial processes with consideration of the mean of upper and lower levels of BAT AELs and the lower levels for the plants of copper production and sulphuric acid production in Bor**
10	**Type of the measure:** Regulatory **Description of a measure:** This measure consists in the enforcement of the directive 2010/75/EU on industrial emissions and especially its Chapter II for large industrial processes covered by its Annex I. Chapter II of the industrial emissions Directive requires an integrated environmental approach to the regulation of certain industrial activities listed in the Annex I. This means that emissions to air, water (including discharges to sewer) and land, plus a range of other environmental effects, must be considered together. The permit conditions have to be set up in order to achieve a high level of protection for the environment as a whole, based on the use of the best available techniques (BAT). The Chapter II of IED requires compliance with BAT Associated Emission Levels (BAT AELs). These BAT AELs are defined in a series of BAT Conclusion Decisions implemented by the EU. When the permit is granted for a plant, the imposed ELVs must be set up to ensure that the pollutant emissions of the plant will remain in the range of the BAT AELs.

	This measure considers that for large industrial plants, the ELVs implemented enable the plants to comply with the average value between the upper and the lower values of BAT AELs (it was only the upper level in the WAM A scenario). The exact deviation from the average of the upper and lower BAT AELs should be assessed at the individual plant level, taking into account the contribution of the plant (including primary and secondary emissions) to air quality and exceedances of certain air pollutants in zones and agglomerations. Most of industrial plants will be compliant with the mean level of the BAT AELs range from 2025, except for those asking for an implementation extension period to be compliant by 2030 as the Project "IED Serbia: Further Implementation of the Industrial Emissions Directive"[38], BAT Conclusion decisions which provide the BAT AEL ranges for each industrial sector covered by the directive, have been published by the EU[39]. In addition in this measure, stricter limit values are considered for plants in the city of Bor since mid AEL values were not sufficient to ensure compliance with air quality limit values for SO_2 and heavy metals in the city of Bor. In order to comply to the SO_2 related air quality limit values and target values for heavy metals in ambient air, the SO_2 and particulate matter emissions have to be additionaly reduced. This reduction can be achieved by enforcing the lower values of the BAT AELs for the production of copper of 50 mg/Nm^3 (the range of BAT AELs is 50 to 500 mg/Nm^3) and 100 mg/Nm^3 for the Sulphuric Acid production (the BAT AELs range from 30 to 680 mg/Nm^3)[40] and with application of lower values for particulate matters as contained in Table 3 of the Commission implementing decision 2016/1032/EU. **EU related objective:** *Industrial processes:* *- installation of abatement technologies,* *- improved control of fugitive emissions from industrial processes,* ***Additional effects of the measure:*** *Reduction of total emissions of the Republic of Serbia to comply with EU directive 2284/2016* *Improvement of air quality in Serbia to avoid exceedances of air quality limit values*

[38] Project was supported through Swedish International Development and Cooperation and (https://www.iedserbia.org/)

[39] https://eippcb.jrc.ec.europa.eu/reference/

[40] BREF of Large Volumne Inorganic chemicals, Executive summary Table V; https://eippcb.jrc.ec.europa.eu/reference/large-volume-inorganic-chemicals-ammonia-acids-and-fertilisers

	EU Accession Negotiation Process: Chapter 27 - Environment						
	Key Implementing entity	**Implementation partners**	**Main air pollutants affected**	**Cost effectiveness [€/kg (air pollutant)]**	**Absolute emission avoided 2025, 2030, 2035**		
					[kt [air pollutant]]		
	MoEP:	Provincial Secretariat for Construction and Environmental Protection and local self-government units AP Vojvodina	NOx	2,68	0,6	2,4	2,5
			SO_2	0,79	2,8	2,9	3,0
			PM_{10}	4,01	0,6	0,9	1,0
			$PM_{2.5}$		0,4	0,6	0,7
			VOC	1,70	0,1	0,1	0,1
WA M-B6	Name of measure/policy: Name of measure/policy: **Enforcement of the IED Chapter V, Annex VII for VOC or chapter 2 for plants with a of solvents consumption larger than 200 t or 150 kg per hour**						
11	**Type of the measure:** Regulatory **Description of a measure:** This measure consists in the enforcement of the directive 2010/75/EU on industrial emissions and especially its chapter V for the use of solvents in certain activities. Some installations may have a consumption of solvents larger than 200 t/year or 150 kg per hour. In that case, the Chapter II applies and installations require an integrated environmental permit. This means that emissions to air, water (including discharges to sewer) and land, plus a range of other environmental effects, must be considered together. The permit conditions have to be set up in order to achieve a high level of protection for the environment as a whole, based on the use of the best available techniques (BAT). The Chapter II of IED requires compliance with BAT Associated Emission Levels (BAT AELs). The recently published Commission Implementing Decision (EU) 2020/2009 of 22 June 2020 establishing the best available techniques (BAT) conclusions, under Directive 2010/75/EU of the European Parliament and of the Council on industrial emissions, for surface treatment using organic solvents including preservation of wood and wood products with chemicals, define the BAT AELs for the different activities. When the permit is granted for a plant, the imposed ELVs must be set up to ensure that the emissions of the plant will remain in the range of the BAT AELs. For other installations, not consuming more than 200 t or 150 kg per hour solvent per year, the limit values of annex V apply. The Republic of Serbia developed a “Regulation on limit values of emissions of air pollutants from stationary pollution sources, excluding combustion plants and Regulation on the list of industrial installations and activities in which volatile organic compounds emissions are controlled, values of emission of volatile organic						

compounds under specific consumption of solvents and total permissible emissions, as well as emission reduction scheme which are consistent with the previous EU Directive 1999/13/EC on the limitation of emissions of volatile organic compounds due to the use of organic solvents in certain activities and installations. This regulation was not yet fully enforced.
Currently, the Royal Norwegian Embassy in Belgrade financially supports implementation of a project to close this gap. The project implementation period is 4 years, starting from 1 December 2018, and closing on 30 November 2022. The component of the project covers the following items:

Activity 1: full transposition of Chapter V of the Industrial Emissions Directive (IED).
Activity 2: the project provides the competent Ministry and the SEPA with complete technical support for the implementation of legal framework prepared under Activity 1. Technical support includes preparation of a preliminary list of VOC operators, as well as development, testing and start-up of the electronic registration and reporting system for entities classified as VOC operators.
Activity 3: capacity building.
Activity 4: information and communication related to VOC regulations.
The measure considers the implementations of the limit values or BAT AELs by 2025.

EU related objective:
4. Industrial processes - Installation of abatement techniques
4. Industrial processes - Improved control of fugitive emissions from industrial processes

Additional effects of the measure:
Reduction of total emissions of the Republic of Serbia to comply with EU directive 2284/2016
Improvement of air quality in the Republic of Serbia to avoid exceedances of air quality limit values

EU Accession Negotiation Process: Chapter 27 - Environment

Key Implementing entity	Implementation partners	Main air pollutants affected	Cost effectiveness [€/kg (air pollutant)]	Absolute emission avoided 2025, 2030, 2035
				[kt [air pollutant]]

	MoEP	Provincial Secretariat for Construction and Environmental Protection and local self-government units, SEPA	VOC	1,22	4,21	4,15	4,10

Specific objective 3: Reduce NH_3 emissions from Agriculture sector by 20.5% Compared to 2015	
WA M-B9	Name of measure/policy: **Introduction of best practices for slurry storage**
12	**Type of the measure:** Education, Information **Description of a measure:** The measure aims at covering slurry storage, with a specific cover (pigs) or with a natural crust (cattle). For pig manure, a flexible cover can be fitted to pig slurry storage, giving 60% emission reduction. This measure has been implemented only for a share of the pigs IPCC farms. For cattle, slurry stores are assumed to develop a natural surface crust, which is an effective cover giving an emission reduction of 40%. It is important to note that the crust will only form if the dry matter is high enough (> 7%) and stirring can be minimized. The crust should cover the whole surface area of the manure. The store should be filled from below the crust to avoid breaking it up. Efficiency of crusts depends on how fully they cover the manure surface, which depends on their thickness, completeness, and duration. This measure has been implemented only for dairy cows. Target values for implementation of this measure is to ensure that by 2030 1,9% of Pig manure will be covered and 3.3% dairy cows manure – Natural crust will be covered. **EU related objective:** Agriculture - improved animal waste management systems; ***Additional effects of the measure:*** Reduction of total emissions of Serbia to comply with EU directive 2284/2016 Improvement of air quality in Serbia to avoid exceedances of air quality limit values (less secondary PM) **EU Accession Negotiation Process: [Chapter 27 – Environment]**

	Key Implementing entity	Implementation partners	Main air pollutants affected	Cost effectiveness [€/kg (air pollutant)]	Absolute emission avoided 2025, 2030, 2035 [kt [air pollutant]]		
	Ministry of Agriculture, Forestry and Water Management	MoEP, Autonomous Province of Vojvodina Local self-government units, SEPA Institut for Science Application in Agriculture, Agricultural extension service	NH_3	2,7	0,02	0,03	0,05
WA M-B8	Name of measure/policy: **Substitution of urea with ammonium nitrate fertilizer**						
13	**Type of the measure:** Education, Information **Description of a measure:** NH_3 emissions from urea-based fertilizers (typically 5%–40% N loss as NH_3) are much larger than those emitted with ammonium nitrate (typically 0,5%–5% N loss as NH3). Switching from urea to ammonium nitrate fertilizer is a rather easy way to reduce NH_3 emissions, with a good efficiency as it can reduce emissions by around 90%. In Serbia, urea is the only urea-based fertilizers consumed, there is no nitrogen solutions. This measure aims at decreasing the share of urea in the mix of mineral nitrogen spread, replacing it by ammonium nitrate. By 2030 Share of urea in total mineral nitrogen should drop to 21,6%, while share of ammonium nitrate in total mineral nitrogen in the same period shall increase to 57,8%. **EU related objective:** Agriculture - low-emission application of fertilizer/manure on cropland and grassland ***Additional objectives to which the measure contributes:*** Reduction of total emissions of Serbia to comply with EU directive 2284/2016 Improvement of air quality in Serbia to avoid exceedances of air quality limit values (less secondary PM)						

	EU Accession Negotiation Process: [Chapter 27 – Environment]						
	Key Implementing entity	**Implementation partners**	**Main air pollutants affected**	**Cost effectiveness [€/kg (air pollutant)]**	**Absolute emission avoided 2025, 2030, 2035**		
					[kt [air pollutant]]		
	Ministry of Agriculture, Forestry and Water Management Ministry of Environmental Protection (for IPCC farms)	Agricultural Extension Service, Directorate for Agrarian Payments, Administration for Agricultural land, Chamber of Commerce of the Republic of Serbia, Farmers Institut for Science Application in Agriculture and Directorate for Plant Protection	NH_3	0,76	3,80	6,56	7,15
WAM A11	Name of measure/policy: **Introduction of the best practices at spreading for solid manure application by faster incorporation of manure in the soil**						
14	**Type of the measure:** Education, Information **Description of a measure:** Rapid incorporation of solid manure (within 4 hours, 12 hours and 24 hours) reduces NH3 emissions at spreading. The shorter the delay of incorporation, the higher the reduction obtained. For pig and poultry manure, this measure aims at developing rapid incorporation within 4 hours and 12 hours. It applies to IPPC farms but also to part of other pigs and poultry farms not included in the IPPC perimeter. For cattle manure, this measure aims at developing rapid incorporation within 4 hours, 12 hours and 24 hours. **EU related objective:** Agriculture - low-emission application of fertilizer/manure on cropland and grassland						

<table>
<tr><td></td><td colspan="7"><u>Additional effects of the measure:</u>
Reduction of total emissions of the Republic of Serbia to comply with EU directive 2284/2016
Improvement of air quality in the Republic of Serbia to avoid exceedances of air quality limit values

<u>EU Accession Negotiation Process: [Chapter 27 – Environment]</u></td></tr>
<tr><td></td><td rowspan="2">Key Implementing entity</td><td rowspan="2">Implementation partners</td><td rowspan="2">Main air pollutants affected</td><td rowspan="2">Cost effectiveness [€/kg (air pollutant)]</td><td colspan="3">Absolute emission avoided 2025, 2030, 2035</td></tr>
<tr><td colspan="3">[kt [air pollutant]]</td></tr>
<tr><td></td><td>Ministry of Agriculture, Forestry and Water Management
MoEP (for IPCC farms)</td><td>Agricultural Extension Service, Directorate for Agrarian Payments, Administration for Agricultural land, Chamber of Commerce of Republic of Serbia, Farmers, Institut for Science Application in Agriculture</td><td>NH_3</td><td>3,09</td><td>0,45</td><td>0,76</td><td>1,04</td></tr>
<tr><td>WAM B7.</td><td colspan="7">Name of measure/policy: <u>Introduction of best practices at spreading for pig and cattle slurry</u></td></tr>
<tr><td>15</td><td colspan="7"><u>Type of the measure</u>: Source-based pollution control

<u>Description of a measure:</u>
In order to reduce NH_3 emissions from manure spreading, there are systems for application of liquid manure using surface band-spreading or injection methods as compared with the traditional broadcast surface spreading. The UNECE Code estimates that these spreading methods typically reduce NH3 emissions by around 80% (injection), 30% to 60% (trailing shoe) or 30% (trailing hose).
Furthermore, rapid incorporation of slurry (within 4 hours and 12 hours) reduces NH_3 emissions at spreading. The shorter the delay of incorporation, the higher the reduction obtained.
Low NH_3 emission manure spreading can become part of an overall strategy of farmers to improve nitrogen management, which improves efficiency, and either reduces costs or increases harvest revenue.</td></tr>
</table>

<table>
<tr><td></td><td colspan="6">This measure aims at developing pig and cattle slurry application by injection and trailing hose followed by an incorporation within 4 hours and 12 hours. For pigs, it applies to IPPC farms but also to part of other pig farms.

<u>EU related objective</u>: Agriculture - low-emission application of fertilizer/manure on cropland and grassland

<u>Additional effects of the measure:</u>
Reduction of total emissions of the Republic of Serbia to comply with EU directive 2284/2016
Improvement of air quality in Serbia to avoid exceedances of air quality limit values (less secondary PM)

<u>EU Accession Negotiation Process: [Chapter 27 – Environment]</u>
<table>
<tr><th rowspan="2">Key Implementing entity</th><th rowspan="2">Implementation partners</th><th rowspan="2">Main air pollutants affected</th><th rowspan="2">Cost effectiveness [€/kg (air pollutant)]</th><th colspan="3">Absolute emission avoided 2025, 2030, 2035</th></tr>
<tr><th colspan="3">[kt [air pollutant]]</th></tr>
<tr><td>Ministry of Agriculture, Forestry and Water Management
MoEP (for IPCC farms)</td><td>Agricultural Extension Service, Directorate for Agrarian Payments, Administration for Agricultural land, Chamber of Commerce of Republic of Serbia, Farmers, Institute for the Application of Science in Agriculture and the Republic Water Directorate</td><td>NH_3</td><td>1,30</td><td>1,20</td><td>2,01</td><td>2,72</td></tr>
</table>
</td></tr>
<tr><td>WAM-C3</td><td colspan="6">Name of measure/policy: <u>Limitation of the burning of agricultural residues (0% in 2030)</u></td></tr>
<tr><td>16</td><td colspan="6"><u>Type of the measure</u>: Regulatory

<u>Description of a measure:</u></td></tr>
</table>

This measure aims at developing the incorporation of crop residues into soils instead of burning. Field burning of agricultural residues is legally restricted in Serbia but it is spread and tolerated despite being forbidden by the Law on Agriculture Land and by Law on fire Protection. Open burning of agricultural residues produces all pollutants emissions but is mainly pointed out regarding $PM_{2,5}$ emissions.
Multiple co-benefits are associated to the incorporation of crop residues into soils (for example: nutrients such as carbon and nitrogen returning to soil).

EU related objective:
Agriculture - other agriculture.

Additional effects of the measure:
Reduction of total emissions of the Republic of Serbia to comply with EU directive 2284/2016
Improvement of air quality in Serbia to avoid exceedances of air quality limit values (less secondary PM)

EU Accession Negotiation Process: [Chapter 27 – Environment]

Key Implementing entity	Implementation partners	Main air pollutants affected	Cost effectiveness [€/kg (air pollutant)]	Absolute emission avoided 2025, 2030, 2035 [kt [air pollutant]]		
Ministry of Agriculture, Forestry and Water Management	Ministry of Interior Local self-government units	NOx	1,17	1,245	2,490	2,586
		SO_2		0,169	0,338	0,351
		PM_{10}		4,008	8,017	8,325
		$PM_{2.5}$		3,864	7,729	8,026
		VOC		2,451	4,902	5,090
		NH_3		1,576	3,152	3,273

Specific objective 4: Promote transition to clean air for everyone	
WAM-C4	Name of measure/policy: **Education on air quality, training for implementation of best practices and awareness raising**

17	**<u>Type of the measure</u>:** Information, education **<u>Description of a measure</u>**: Combating ambient air pollution in behaviour of all actors in society: from top level decision making at public and private levels, to daily consumption patterns. Change is best operated through a multitude of stimulus, which can effectively be provided through education, capacity building and awareness raising. The implementation of the measures included in this action plan and the achievement of the general and specific objectives inscribed in the Programme will the increase of activities, in particular in energy related services to households (replacing the heating system, old boiler, installation of new Eco-Design compliant appliances and clean technology solutions). The proposed promotion activities shall include at least the following areas: • Education: implementation of environmental protection and quality of air projects and the role of children in its preservation. • Capacity building, awareness raising campaigns and counselling to the households about the proper use of small appliances using solid fuels and conducting the assessment of the moisture content of the wooden biomass. • Establishing of the mobile demonstration centre (or equivalent) for knowledge sharing regarding the proper use of biomass in small appliances and boilers • Awareness raising and education of farmers regarding the implementation of good practices to mitigate ammonia emissions, prevent excessive nitrogen intake and to protect the underground water. • Other awareness raising aimed at reaching the widest audience possible, focusing on the key aspects / behaviours that can contribute to the successful implementation of the measures included in this programme. • Awareness campaigns to stimulate the old polluting technologies phase out and replacement with clean energy sources **<u>EU related objective</u>:** Other – Awareness raising activities; ***<u>Additional effects of the measure:</u>*** Improving the energy efficiency of final energy consumption Reduction of GHG emissions **<u>EU Accession Negotiation Process: [Chapter 27 – Environment]</u>**

	Key Implementing entity	Implementation partners	Main air pollutants affected	Cost effectiveness [€/kg (air pollutant)]	Absolute emission avoided 2025, 2030, 2035 [kt [air pollutant]]		
	MoEP	Ministry of Education, Ministry of Health, Local self-government units, AP Vojvodina, SEPA, Chamber of Commerce of Republic of Serbia, Research Institutions	PM_{10}, $PM_{2.5}$,, NOx	n.a.	n.a.	n.a.	n.a.

7.2 Costs, financing and timeline for the implementation of measures and its activities by 2030

7.2.1 Cost of implementation

Measures proposed by the Programme require additional investments across different sectors compared to with existing measures scenario. These additional investment costs are estimated at 2595Mln EUR for the period 2022-2030.

Such additional investment costs will be shared among consumers/households (for example in buying more efficient and less polluting cars and heating appliances or switching the fuel used for heating), investors, e.g. public or private companies and farmers (new end of pipe technologies to meet BAT AELs, new slurry storage techniques) and the State. Since the measures for achieving the set goals do not require State investment costs, it is planned that State budget will contribute to the financing of the measures implemented mainly by consumers[41]. It is envisaged that Consumers will bear 75,2% of the investment costs and Investors the remaining 24,8%.

Out of the total investment costs 90,4% or 2346 Mln€ of the costs is to be dedicated for implementation of measures under Specific objective 1 (of which394,4Mln€ or 16,8% is to be covered by investors), 195,6 Mln€ (6,6%) for implementation of Specific objective 2 (all to be covered by investors) and 52,7Mln€ (1.8%) for implementation of measures under Specific objective 3 (all to be covered by investors-farmers).

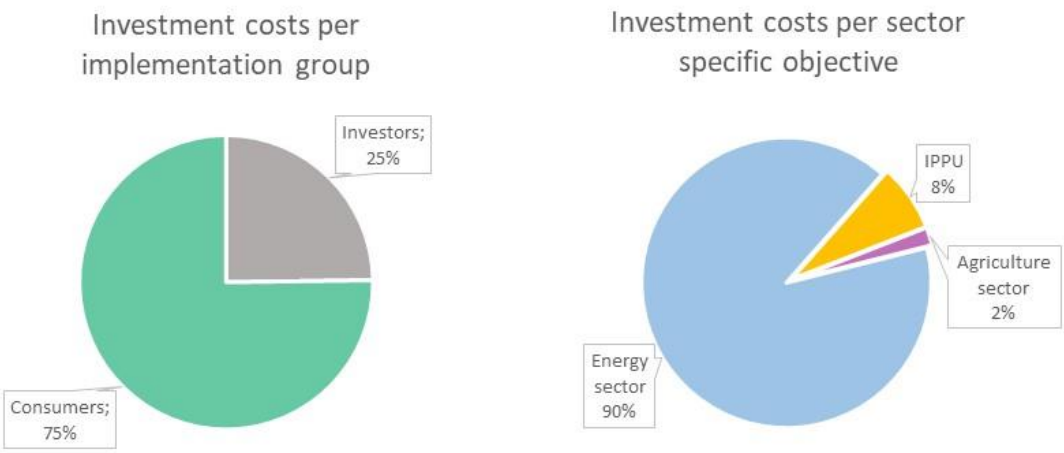


Figure 25: Share of investment cost in the period 2022-2030

The State will have an additional role to support the implementation of the measures in the Programme, though the definition of the regulatory, fiscal and incentive schemes. In this context, the revenues from the currently applied polluters pay principle[42] shall be treated by the State

[41] Direct co-financing of measures to the public or private companies is subject to State aid rules

[42] Currently the polluters pay principle is implemented by Regulation on types of pollution, criteria for environmental pollution and payers, amount and manner for the calculation and payment, where polluters need to pay for emissions of SO_2, NO_2 and PM emissions and disposed waste. Through this mechanism was according to publication "Report on economic instruments for

as an important source of financing of state incentives. However, this source of financing is expected to dry out by 2030 due to implementation of National Emission Reduction Plan, therefore alternative approaches, building on the same principle, will need to be considered.

All funds from the budget provided for the implementation of activities in the accompanying Action plan for the period 2022 –2026, are planned within the limits set by the Ministry of Finance for all budget users.

For a number of measures for which costs have been estimated, but the funds have not been clearly dedicated, after the adoption of the Programme, further planning of funding sources for these measures is to be carried out according to the Action Plan.

Specific objective 1

For the implementation of measures under the scope of Specific objective 1, additional 2346,3 Mio€ (90,4% of total investment costs) will be needed up to 2030 of which additional 1243,4Mln € should be invested (cumulatively by 2030) in the renewal of vehicle fleet driven by setting higher EURO standards for second hand vehicles first time registered in the Republic of Serbia. Additional 453,1Mln € is expected to be invested due to financial incentives for scrappage schemes where the most polluting vehicles are to be replaced with those complying with at least Euro 5 or higher. For additional replacement of boilers and furnaces with devices that meet the requirements of ecodesign, including the installation of heat pumps in Kragujevac, Niš, Valjevo Užice and Belgrade, which is supported by subsidies, it is necessary to invest 476.9 million €. The most resources from investors will be required to comply with minimum Euro standards for imported vehicles (cargo vehicles and busses), where additional investments costs will amount to 140,6Mln €. Furthermore the compliance of medium combustion plants with Industrial emission directive will require additional 115,8Mln € of investments, while the implementation the remaining measures such as Enforcement of the Chapter II of the EU Directive Industrial emissions for Large Combustion Plants with consideration of the mean of upper and lower levels of BAT AELs, enforcement of limit values for smallest combustion plants (lower than 1 MW), requirements relating to gaseous and particulate pollutant emission limits for non-road mobile machinery and measures limiting VOC emission from storage and distribution of petroleum products will for investors amount to remaining 138,0Mln €.

Specific objective 2

Implementation of measures in the scope of Specific objective 2 will by 2030 require additional 195,6Mio€ of which 125,4Mln € will be required for compliance with VOC limitations due to solvent use in certain installations while enforcement of the Chapter II of the EU Directive Industrial emissions for industrial processes with consideration of the mean of upper and lower levels of BAT AELs. The lower levels for the plants of copper production and sulphuric acid production in Bor will require 70,2 Mln € of cumulative investments in the period 2022-2030.

Specific objective 3

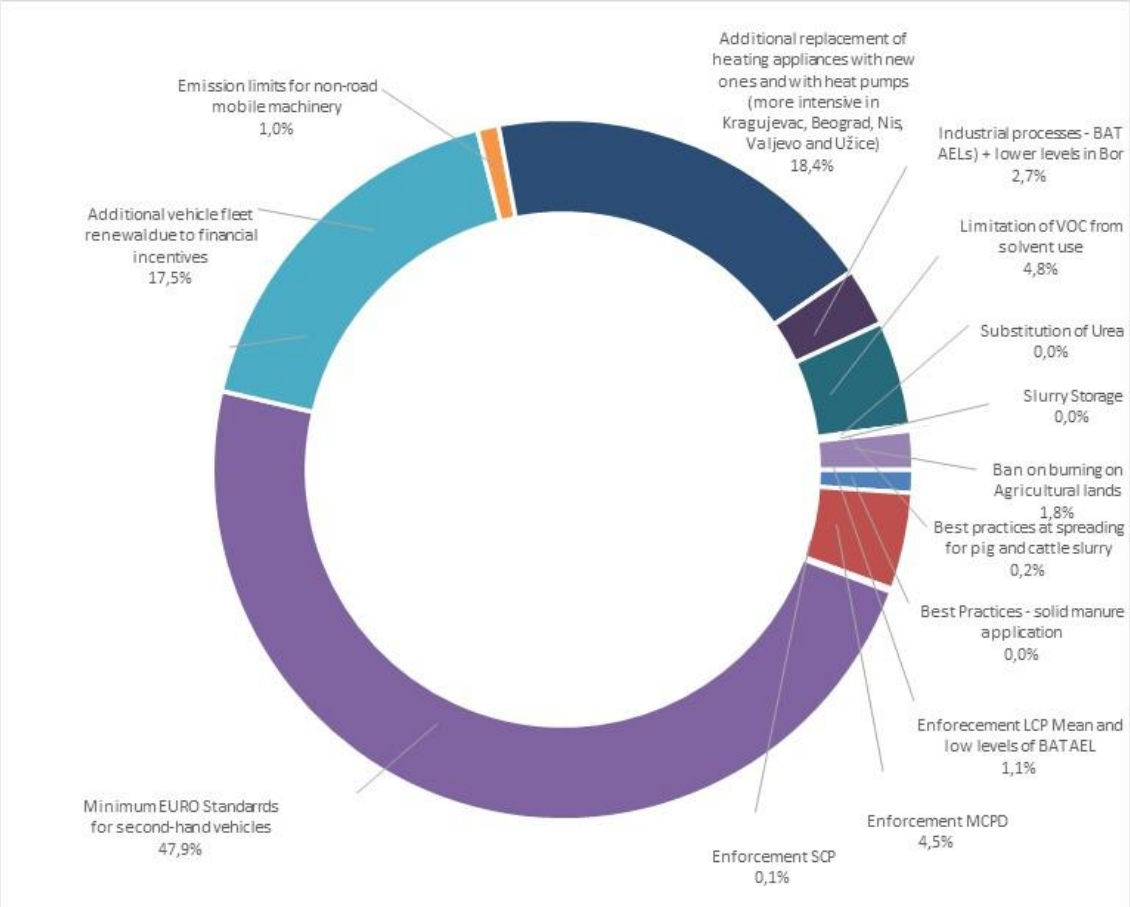
Investment costs for implementation of agriculture measures which are in the scope of Specific objective 3 will by 2030 amount to 57,2Mi €, the majority of the costs (46,2Mio€) goes to in the

environment protection in the Republic of Serbia, 2019 indicators review", Belgrade 2021, p.11 collected 6,27BlnRSD (cca 53Mio€) of which it is estimate that around 30Mio€ comes from air pollution

limitation of open burning of agricultural residues, which can be achieved through improvements in agricultural machinery, implementation of good practices and stricter enforcement, while the remaining 5,7Mio€ of the investment costs is dedicated to Introduction of best practices at spreading for pig and cattle slurry.

Detail breakdown of investment costs is presented in Figure 26 below.

Figure 26: Shares of additional investment costs (%) for the WAM C Scenario in the period 2022-2030



7.2.2 Expected resources need for financing support of the measures

Two main measures primarily targeting PM_{10}, $PM_{2.5}$ and NO_x emissions do envisage subsidies since the natural phase out of old technology and replacement with a new one would take much more time, and therefore the vision of the programme would be endangered. Furthermore, in some cases the old technologies need to be replaced with a specific green technology with no direct emissions of air pollutants (e.g. heat pumps) in order to achieve general and specific objective of the program, which can be achieved with the targeted subsidies. Financial incentives needed for implementation of WAM C scenario are presented in **Table 7-4** below.

Table 7-4 Financial incentives needed to implement WAM C scenario

No.	Specific objective	Measure	Financial incentive needed 2022-2030 [Mln€]

5	S.O.1	Additional vehicle fleet renewal due to financial incentives for scrapping oldest Euro 1, 2 and 3 diesel passenger cars and cargo vehicles (except N3) and for EURO I, II and III diesel busses.	159
7	S.O.1	Additional replacement of existing domestic heating appliances with new appliances Eco-Design compliant and heat pumps due to financial incentives, with larger share of replacement in the cities of Kragujevac, Beograd, Nis, Valjevo and Užice	258
		Total	**417**

In Total it is envisaged that cumulative incentives given to consumers in the period 2022-2030 should reach 417Mln €, of which the 62% (258.4 million euros out of 417 million euros) goes for additional replacement of the existing domestic heating appliances with new eco-design compliant ones and with heat pumps. Furthermore it has to be ensured that five cities that are considered as fine particles hot spots has a sufficient resources available for the financial incentives as listed in **Table 7-5** below

Table 7-5 Cumulative financial incentives needed for specific zone and agglomeration

Zone/Agglomeration	Minimum finance incentive [Mio€]
Kragujevac	5,6
Belgrade	39,6
Niš	25,9
Valjevo	13,9
Užice	13,6
Republic of Serbia	159,8
TOTAL	**258,4**

7.2.3 Financing models of the program

Some of the financing options for implementation of the Programme are described in the following sub-chapters.

7.2.3.1 Polluter pays principle (PPP)

The polluter pays-principle is set out in the Treaty on the Functioning of the European Union (Article 191(2) TFEU) and has been a dominant EU concept in the combating climate change and in financing long-term sustained emissions reductions. This principle helps consumers to recognize the true costs of things.

Two options of polluter pay principle are considered for the financing of the Programme:

(1) Use of revenues collected pursuant to the Law on Charges for Usage of Public Goods ("Official Gazette of the Republic of Serbia", No. 95/18 and 49/19)**.**

In compliance with the state aid rules the revenues generated from fees should be used for financing policies and measures of this programme such as:

1) Financial incentives to faster the replacement of existing domestic heating appliances with new appliances Eco-Design compliant and heat pumps;
2) Enforcement of limit values for smallest combustion plants (lower than 1 MW) of the national regulation on emission limit values of pollutants in the air from combustion plants.

Total amount of revenues collected annually (cca 52Mln €) by the Law on the fees for the usage of public goods is expected to reduce after the 2025 when it is expected that the majority of the abatement measures contained in the NERP will be completed, hoverer cumulatively it is expected that revenues can **amount up to 300Mio €** in the period 2022-2030.

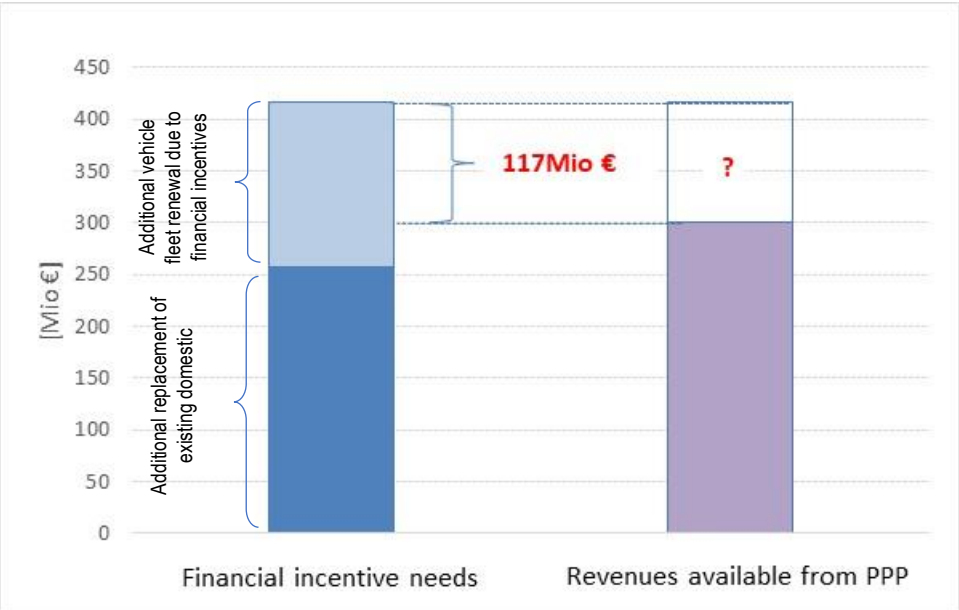


Figure 27: Financial incentives needed to implement WAM C vs expected revenues available from current PPP mechanisms

In order to ensure the sustainable financing of the implementation of WAM C scenario at least 117Mio€ would need or ensured through public financing or the expand the polluters pay principle to categories which are currently not covered by this principle, such as road transport sector.

(2) Implementation of environmental taxation on vehicles

Implementation of environmental tax can to be in principle gradually implemented in the road transport taking into account that accelerated vehicle feet renewal and the significant share of the costs for incentives (38.1%) for the implementation of WAM C scenario.

Two options for taxation based on environmental performance are widely used in the EU.

1) Taxation applicable when vehicle is registered in the country for the first time[43]
2) Annual tax applied for annual car registration

Those two options could be considered separately or combined.

[43] This option in principle ensures the same outcome as banning the import of second-hand cars, since bans of the import of products already put on the EU market are not in line with the EU concept of free movements of goods.

Possible ways of overcoming the gap of 117 million € which is missing is to tax the environmental performance of passenger cars as follows: If the taxation would be applied on diesel passenger cars on annual basis on PM performance based on EURO standards 1g/km would need to be taxed by 441€ which would require the additional cost ranging from 88€/year for pre-EURO diesel cars 44€/y for EURO 3 diesel cars down to 2€/y for EURO 6 diesel cars. The yearly revenues collected through such mechanism would in 2023 be at the level of 32.3Mio€ and declining to 5.3Mio€ in 2030.

One of the options would also to fully cover necessary subsidies (159 Mio€) for implementation of this measure through the environmental taxation of passenger vehicles. In such case 1g of PM would need to be taxed at the level of 600€/y, which would require for owners of EURO 3 passenger cars additional 60€y, EURO 4 owners 30€/y and EURO 5 owners 15€/y. Such of an approach would generate 43,9 Mio€ of additional revenues in 2023 and 7,3mio€ in 2030.

This approach can also be combined with passenger cars performance regarding the specific NOx emissions. In such an event the taxation base would expand to all passenger cars (with internal combustion engine). If NOx would be taxed at the level of 40€ and PM at the level of 165€. Diesel car owner would need to pay in addition between 71€/y and 4€/y of additional tax per year depend on the EURO standard of the car, while the petrol/LPG car owners would need to pay between 40€/y and 2,5€/y of additional tax in order to ensure 159Mio€ of revenues would be collected in the period 2023-2030.

7.2.3.2 Public financing

Public financing is the catalyst of the implementation of the program and, in consequence, the long-term transition to a clean air for everyone in the Republic of Serbia. As a catalyst, it will not directly finance the implementation alone and it is not necessarily the greatest financer of each measure. Public finance can provide the seed money to mobilize other sources of financing, namely that from the private sector and or from international partners, such as the EU, the World Bank or other bilateral and multilateral organizations.

Since measures related to energy efficiency, transition to low carbon economy and activities under the Green agenda contributes to the improvement in air quality all those fund could be considered as one to contribute to achieving the general objective of this program. The budget dedicated in 2021 are. Available budgetary funds for financing of measures for ensuring the clean ambient air, enhancement of carbon sinks and emission reductions and budgets dedicated in 2020 are:

1) Budgetary fund for energy efficiency (500,5 million RSD)
2) Green Fund (4343 million RSD)

Aggregate available financing in 2020 was 4843,5 billion RSD that is app. 41 million EUR, which currently represents just a fraction (9,8%) of resources needed.

Upgrading and streamlining of these instruments may be required, so at to ensure the effective management of the future revenues to be generated and their timely use for supporting the implementation of the measures included in this programme.

7.2.3.3 Private sector financing

The private sector, including companies held by state, will take up a share of the required investments to increase energy efficiency, reduce GHG emissions and therefore also reduce emissions of air pollutants. In order to support and promote such private sector investments, a set of "green finance" instruments have been developed, which are available at European level and are expected to be available to Serbian players. Such instruments include: Green bonds; Green loans; Sustainable investment funds; Impact funds / impact investments, and Blended finance.

7.2.3.4 International financing

EU Financing

The key sources of financing from the EU for the purpose of economic convergence by less-developed regions, employments, social inclusion and good governance, agriculture, regional and urban development, research, innovation and modernisation and sustainable development are:

- EU Instrument for Pre-Accession – IPA
- EU Twinning programme
- IPARD (until accession), after accessions
    - the European agricultural guarantee fund (EAGF),
    - the European agricultural fund for rural development (EAFRD). – regional and urban development
- LIFE Strategic Integrated Projects (SIPs) and Strategic Nature Projects (SNAPs)
- EU Territorial Cooperation Programmes (INTERREG)
- Horizon 2020 / Horizon Europe

Bilateral and Multilateral funds and partners

The key sources of bilateral and multilateral financing for the Republic of Serbia are

- The World Bank
- The European Investment Bank (EIB)
- The European Bank for Reconstruction and Development (EBRD)
- The Council of Europe Development Bank (CEB)
- KFW (German Development Bank)
- AFD (French Development Agency)

Detailed table of costs, financing and timeline for the implementation of measures and its activities by 2030 are presented in *Table **7-6*** below

Table 7-6: **Detailed table of costs, financing and timeline for the implementation of measures and its activities by 2030**

No.	Name of measure/activity	Investment Costs [44] [Mio EUR]			Add. budget revenues [45] [Mio EUR]	Source of finance [Mio EUR]			Note	Deadline for implementation
		Investors	Consumers	State		Private sector	EU and other funds[46]	National Budget		
Specific objective 1: Reduce emissions of SO_2 by 92% and fine particles $PM_{2.5}$ by 58.3% from Energy sector (including traffic and residential combustion) in 2030 compared to 2015										
No.1 (WAM B1)	**Enforcement of the Chapter II of the EU Directive Industrial emissions for Large Combustion Plants with consideration of the mean of upper and lower levels of BAT AELs**	**27,9**					**0,4**	**(3,24)[49]**	Investments in reduction techniques for SO_2, NOx and PM	**2025**
[A] [47]	Ensure the full alignment of the national legislation with the IED for LCP covered in its annex I - Amendments to the bylaws.[48],								The project IED Serbia "Further implementation of the Industrial Emission Directive in Serbia" has identified amendments necessary to upgrade correctly the current legal framework and ensure full implementation of the IED Directive. According to the DSIP, the amendments to the existing legal framework was scheduled by 2021, however amendments are not	2022

[44] For the purpose of these estimates, costs have been allocation to who makes the investment, irrespective of its capacity to pass the costs of the investment down the value chain to consumers and irrespective of any public subsidies or incentives it received. Investors have been considered to represent companies, public or private and farmers; consumers represent households and state represents state budget

[45] This column is applicable only if the beneficiary is to express the intention to introduce polluter pays principle supported by the relevant policy framework (taxation/ recycling of the environmental taxes), expected collection period for these income is 7 years from the moment of introduction of the polluter pays principle.

[46] EU IPA funds are primarily dedicated to institutional harmonization and investments into infrastructure (note - AQ monitoring stations are deemed as infrastructure),…. Investments to be conducted by private investors and or industry are subject to state aid rules in principle limited to de-minimis rule (in principle 200.000 € in 3 consecutive years)

[47] Notation key "A"= Administrative activity linked to transposition of relevant EU legislation

[48] Amendments are needed for industrial processes emissions where the BAT AELs are missing or not addressed in simplified manner

No.	Name of measure/activity	Investment Costs [44] [Mio EUR]			Add. budget revenues [45] [Mio EUR]	Source of finance [Mio EUR]			Note	Deadline for implementation
		Investors	Consumers	State		Private sector	EU and other funds[46]	National Budget		
									expected before end of 2022. No additional work programme is proposed at this level.	
	Ensure that the increase of human resources of Serbian institutions in order to deal with issuing IPPC permits, has been done as this was established in the DSIP for the IED (Project IED Serbia) : MEP - Department for integrated permits : 4 working places, permit writers, fulfilment vacant positions; 6 working places with technical competences (gradual increase of number of employees within this unit in mid-term perspective) and 1 working place with legal competences Autonomous Province of Vojvodina (Provincial Secretariat for Urban Planning and Environmental Protection): 2 working places, permit writers, 1 working place with legal competences MEP: IED Chapter III : 1 working place with specialization in LCP IED chapter IV: 1 full time working place specialized for waste incineration chapter IED chapter V: 1 working place, officer with a background in chemical engineering SEPA:							(3,24)[49]	The project IED Serbia "Further implementation of the Industrial Emission directive in Serbia" has identified the additional human resources to ensure that permits are issued correctly and on time. According to the DSIP for the IED developed by the Project IED Serbia, the level of additional resources needed has been identified (18 working places). No additional requirements have been identified at this level, however the costs for these additional human resources are provided.	2022

[49] Costs for additional administrative capacities already included in DSIP Industrial Emission Directive

No.	Name of measure/activity	Investment Costs [44] [Mio EUR]			Add. budget revenues [45] [Mio EUR]	Source of finance [Mio EUR]			Note	Deadline for implementation
		Investors	Consumers	State		Private sector	EU and other funds[46]	National Budget		
	IED chapter V: 1 officer with a background in chemical engineering									
	Ensure that all large combustion installations, are compliant their updated IPPC permits.	27,9[50]								2025
	Ensure that all IED plants report to the National Register of Pollution Sources (which fills the E-PRTR). Set up a programme for checking the quality and consistency of air emission reports to the National Register of Pollution Sources (The consistency						0,4		To be funded by donors	2022-2024
No.2 (WAM A2)	**Enforcement of the EU Directive 2015/2193 Medium Combustion plants**	**115,81**					**0,8**	**0,54**	Investments in reduction techniques for SO_2, NOx and PM in order to make all medium combustion plants compliant with the emission limit values of Directive	**2025 for plants larger than 5 MWth and 2030 for plants betwee**

[50] Total costs estimated by the project IED Serbia are not reproduced at this level of the Air pollution action plan, as these costs are covered by the DSIP for the Industrial Emission Directive. The costs of reduction of emissions from IED plants are only additional costs compared to the scenario WEM are considered, in which costs of compliance with national regulation are already taken in account. Indeed, it has to be noted, that the current national "Regulation on limit values of emissions of air pollutants from stationary pollution sources, excluding combustion plants" implements ELVs which are not always so far from the BAT AELs. Moreover, the costs considered in the IED Serbia are total costs for plants to comply with all limit values and requirements for air, waste, energy efficiency, noise, water.

No.	Name of measure/activity	Investment Costs [44] [Mio EUR]			Add. budget revenues [45] [Mio EUR]	Source of finance [Mio EUR]			Note	Deadline for implementation
		Investors	Consumers	State		Private sector	EU and other funds[46]	National Budget		
										n 1 and 5 MW
[A]	Finalise the full alignment of the national legislation with the MCPD, by: - Adopting a Regulation on emission limit values of pollutants in the air from medium combustion plants.						IE[51]		Activities are ongoing	2022
	Implementation of the requirements of the MCPD: - through continuation of analysis of available data on MCPs; - through establishment of a reporting system[51].						0,8		To be funded by donors	2023
	Compliance of medium combustion plans with limit values	115,81							Medium combustion plants need to ensure that in next investment cycle they will be able to reach the limit values of MCPD	2025-2030

[51] In the scope on the ENVAP 3 project (funded by the Swedish International Development Cooperation Agency (SIDA) and carried out by the Swedish Environmental Protection Agency for the period 2016-2021) assisting Serbia and MEP in preparing to negotiate and comply with Chapter 27 Environment requirement, a preliminary assessment of current situation regarding total number of medium combustion plants in the Republic of Serbia has been made. This assessment needs to be consolidated and the database established.

No.	Name of measure/activity	Investment Costs [44] [Mio EUR]			Add. budget revenues [45] [Mio EUR]	Source of finance [Mio EUR]			Note	Deadline for implementation
		Investors	Consumers	State		Private sector	EU and other funds[46]	National Budget		
	Ensure an increase of human resources of Serbian institutions in order to deal with the MCPD (but also SCP (MoEP : 2 working place, AP Vojvodina: 1 working place and SEPA: 1 officer)							0,54	Four additional administrative capacity in the institution to deal with MCP, SCP and domestic heating appliances	2023-2025
No.3 (WAM A3)	**Implementation of the Regulation on emission limit values for polluting matters into the air from combustion plants in the part related to small plants with small combustion plants (capacity up to 1 MW), and which are not subject to the Ecodesign Directive**	**3,77**					**0,1**		Investments to make the combustion compliant with limit values for PM (0,267Mio€) and NOx (3,5mio€)	**2030**
[A][4]	Update emission limit values for small combustion installations with a capacity of less than 1 MW (boilers or stationary engines)						0,1		To be funded by donors or EU TAIEX support mechanism (Technical Assistance and Information Exchange instrument of the European Commission)	2022-2023
	Ensure compliance with stricter emission limit values for small combustion installations not subject to the Eco-design Directive	3,77								2025-2030
No.4 (WAM B4)	**Enforcement of minimum Euro standards for second-hand vehicles imported: Euro 5/V from 1st January 2024 and Euro 6/VI from 1st January 2025**	**140,64**	**1102,76**				**0,01**		The costs are due to additional costs for buying new vehicles compliant with Euro 6/VI from 2025	**2023-2025**
A	Amend the Regulation on the import of motor vehicle (Official Journal of RS, no 23/10 and 5/18) standards for imported passenger cars, cargo vehicles and busses. The minimum standards are Euro 5/V from 1st January 2024 and Euro 6/VI from 1st January 2025.						0,01		EU TAIEX support mechanism	2023

No.	Name of measure/activity	Investment Costs [Mio EUR] [44]			Add. budget revenues [45] [Mio EUR]	Source of finance [Mio EUR]			Note	Deadline for implementation
		Investors	Consumers	State		Private sector	EU and other funds[46]	National Budget		
	Compliance with updated minimum requirements for passenger cars, NRMM and busses	140,64	1102,76						This measure work in combination with the measure WAM B5)	2024-2025
No.5 (WAM B5)	**Additional vehicle fleet renewal due to financial incentives for scrapping oldest Euro 1, 2 and 3 diesel passenger cars and duty vehicles (except N3) and for EURO I, II and III diesel busses.**	**80,91**	**372,20**		****69**		**1,5**	**158,6**	The oldest vehicles are replaced by newer ones (younger vehicles compared to the Euro 1 to Euro 3 vehicles replaced). The costs are due to additional costs for buying new vehicles (which can be second hand vehicles) compliant with Euro 6/VI as this measure is associated with the measure WAM B4 which imposes stricter standards to imported second hand vehicles, Euro VI or 6 from 2025 and beyond.	**2024-2028**
	Prepare and adopt an end-of life vehicle management plan and enhance the vehicles recycling centers						1,0		Donors funding necessary to prepare end-of life vehicle management plan and enhance the vehicles recycling centers	2023
	Set up and implement the public financial support mechanism for the scrapping of old diesel passenger cars, light duty vehicles and busses (respectively Euro 1, Euro 2, Euro 3 and Euro I, Euro II and Euro III).	80,91	372,20				0,5	158,6	Donors funding necessary to set up a financial support schemes for scraping of old diesel vehicles	2026
	Implementation of the Law on taxes on the use, possession and carrying of goods, in the part related to the tax for the use of motor vehicles				****69**				The amendments to the Law in order to incentivize the use of motor vehicles whose impact to the air and	2028#[52]

[52] # The measure is still valid after the stipulated deadline

No.	Name of measure/activity	Investment Costs [Mio EUR] 44			Add. budget revenues 45 [Mio EUR]	Source of finance [Mio EUR]			Note	Deadline for implementation
		Investors	Consumers	State		Private sector	EU and other funds 46	National Budget		
									environmental protection is more favorable	
No.6 (WAM A6)	**Enforcement of regulation (EU) 2016/1628 on requirements relating to gaseous and particulate pollutant emission limits and type-approval for internal combustion engines for NRMM**	**25,39**					**0,3**	**0,36**	Costs due to introduction of new reduction equipment on new machines	**2025**
A	Finalise the work programme for full alignment of the national legislation with the regulation 2016/1628 through the Rulebook on emission limit values of gaseous and particulate pollutants and homologation of internal combustion engines for off-road mobile machinery (NRMM).						0,1		PLAC3 support instrument	2024
	Ensure an increase of human resources of Serbian institutions in order to deal with the NRMM legislation (but also road traffic and other traffic modes): MCTI: 1 working place Agency for Traffic Safety: 2 working places							0,36	Additional administrative capacity at MCTI is needed to deal with NRMM	2025
	Implementation of on emission limit values of gaseous and particulate pollutants and homologation of internal combustion engines for NRMM	25,39							Incremental cost of Stage V internal combustion engines for NRMM	2022-2025
No.7 (WAM C1)	**Faster replacement of existing domestic heating appliances with new appliances Eco-Design compliant with financial incentives and larger share of replacement in the cities of Kragujevac, Beograd, Nis, Valjevo and Užice**	**0**	**476,90**	**0**			**0,3**	**261,06**	Costs due to renewal of domestic heating appliances with new eco-designed appliances or heat pumps	**2022-2030**
A	Finalise the work for full alignment of the national legislation with the Eco-design directive and work in order the two following regulations are transposed: Regulation 2015/1189 of 28 April 2015 implementing Directive						0,3		To be funded by donor funds	2023

No.	Name of measure/activity	Investment Costs [44] [Mio EUR]			Add. budget revenues [45] [Mio EUR]	Source of finance [Mio EUR]			Note	Deadline for implementation
		Investors	Consumers	State		Private sector	EU and other funds[46]	National Budget		
	2009/125/EC of the European Parliament and of the Council with regard to Eco-design requirements for solid fuel boilers. Regulation 2015/1185 of 24 April 2015 implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to Eco-design requirements for solid fuel local space heaters.									
	Establish and implement a mechanism for financial incentives for replacement of existing domestic heating appliances with new appliances Eco-Design compliant and heat pumps.		476,90					258,36	A mechanism should be established in cooperation of the Recyclers association of Serbia or to ensure that replaced appliances are not returned to the marked in Serbia or in the neighboring countries.	2023-2030
	Facilitate the mechanism of financial incentives by ensuring additional 15 FTE in the aim to inform the public on how to reduce emissions from domestic heating appliances and facilitate the access to financial support. Out of 15FTE at least 2 FTE could be located in Beograd, 1FTE in Nis and 1FTE in Kragujevac, Valjevo and Užice.							2,7	It is estimated that 15 additional FTE are needed to facilitate the implementation of the financial incentives at national and local level.	2024-2030
No.8 (WAM A7)	**Enforcement of the amended fuel quality Directive 2009/30/EC and Directive 2016/802/EC on the reduction of the Sulphur content of certain liquid fuels**	**(419)[53]**					**0,1**	**IE**	Investment costs already included in DIPS Fuel Quality and DSIP Sulphur content of certain liquid fuels	**2025**
A	Finalise the work programme for full alignment of the national legislation with the fuel quality Directive 2009/30/EC (FQD) and						0,2		To be funded by donors	2023

[53] Investment costs already included in DIPS Fuel Quality and DSIP Sulphur content of certain liquid fuels

No.	Name of measure/activity	Investment Costs [44] [Mio EUR]			Add. budget revenues [45] [Mio EUR]	Source of finance [Mio EUR]			Note	Deadline for implementation
		Investors	Consumers	State		Private sector	EU and other funds[46]	National Budget		
	Directive 2016/802/EU on the reduction of the Sulphur content of certain liquid fuels[54].									
	Investments needed to ensure compliance with Fuel quality Directive and on the reduction of the Sulphur content of certain liquid fuels.	(419)[53]							Estimated investment by oil industry in Serbia	2025
	Increase the human resources of institutions: 6 FTE for monitoring of directive implementation							IE	Costs for 6 FTE are needed to ensure the compliance with the FQD and Sulphur content of certain liquid fuels already included in the DIPS Fuel Quality and DSIP Sulphur content of certain liquid fuels	2024
No.9 (WAM A8)	**Limiting VOC emissions by implementing the requirements of VOC Petrol Directives 94/63/EC (Stage I) and 2009/126/EC (Stage II) collecting petrol vapours from the storage and transport of petrol and refuelling motor vehicles at petrol stations**	**(39,22) 55**					**0,1**	**IE**[55]	Equipment of service station with techniques to avoid VOC emissions from station tank loading -Stage I) and from vehicle tank loading (stage II)	**2028**
A	Finalise of the legal transposition plan for the Directives 1994/63/EC and 2009/126/EC[56]						0,1		To be funded by donors	2023

[54] Two DSIPs in the scope of the EAS3 project, have been developed and detail list of the Laws, Regulations and Rulebooks to be amended.

[55] The investment costs as contained in the Directive Specific Implementation Plan (DSIP) for directives 94/63/EC (stage I) and 2009/126/EC (stage II). Since the cost is included in DSI and in order to avoid double counting this investment cost is not accounted under this Programme

[56] Transposition of acquis will require amendments to the Law on Air Protection; Rulebook on technical measures and requirements in relation to allowed emission factors for volatile organic compounds resulting from the storage and transport of petrol (Hereinafter: VOC Petrol Rulebook); Rulebook on methodology for preparation of national and local register of pollution sources, as well as methodology for types, methods and deadlines of data collection (National Register of Pollution Sources- NRPS) (Hereinafter: Rulebook of NRPS)

No.	Name of measure/activity	Investment Costs [44] [Mio EUR]			Add. budget revenues [45] [Mio EUR]	Source of finance [Mio EUR]			Note	Deadline for implementation
		Investors	Consumers	State		Private sector	EU and other funds[46]	National Budget		
	Increase human resources in SEPA and MEP for implementation of the Directives.							IE[55]	Total administrative costs by the end of 2028 for new employee salaries and training of these persons and inspectors, workplace equipping, establishing SEPA register and accreditation costs	2028
	Implement vapour capture in the gasoline supply, distribution and transport system	(39,22) [55]							Compliance with the Stage I and Stage II will require a vapor recovery systems to be implemented along the gasoline supply chain	2028
Specific objective 2: Reduce emission of air pollutants and heavy metals from Industrial processes and product use through compliance with BAT associated emission levels										
No.10 (WAM C2)	**Enforcement of the Chapter II of the EU Directive Industrial emissions for industrial processes with consideration of the mean of upper and lower levels of BAT AELs and the lower levels for the plants of copper production and Sulphuric acid production in Bor**	**70,21**					**IE[57]**	**IE[57]**	Additional human resource are already accounted under Measure No.1.	**2024 (2030 for those asking for period extension)**
	Ensure that all large industrial plants covered by annex I of the IED, have their IPPC permits issued and comply relevant BAT						IE[57]		With additional human resources set up, the programme of issuing permits	2024-2030

[57] Included in Measure No.1

No.	Name of measure/activity	Investment Costs [44] [Mio EUR]			Add. budget revenues [45] [Mio EUR]	Source of finance [Mio EUR]			Note	Deadline for implementation
		Investors	Consumers	State		Private sector	EU and other funds[46]	National Budget		
	AELs.- Amendments to the Regulation on limit values of emissions of air pollutants from stationary pollution sources, excluding combustion plants (OGRS N°111/15)[58].								for all the plants considered under Annex I can be fulfilled. The human resources for that have been extended, see above.	
	Ensure compliance with BAT AELs for industrial emissions taking into account air quality in zones and agglomerations and lower SO_2 values of the BAT AELs for the production of copper of 50 mg/Nm^3 and 100 mg/Nm^3 for the Sulphuric Acid production and lower BAT AELs for particulate matter for copper production as contained in Table 3 of the Commission implementing decision 2016/1032/EU.[59]	**70,21**							Attainment of the limit values for copper production and sulfuric acid production can ensure the compliance of the air quality in Bor with the SO_2 related limit values and target values for cadmium and arsenic.	2025
No.11 (WAM B6)	**Enforcement of the IED Chapter V, Annex VII for VOC or chapter II for plants with a consumption of solvents larger than 200 t or 150 kg per hour**	**125,41**					**(0,43)[60]**		Costs of installations of reduction techniques and use of low solvent content products	**2025**
A	Amend Regulation on limit values of emissions of air pollutants from stationary pollution sources, excluding combustion plants and Regulation on the list of industrial installations and activities in which volatile organic compounds emissions are controlled, values of emission of volatile organic compounds under specific						IE (activity below)		Amendments and full implementation of the directive is envisaged trough the support The Royal Norwegian Embassy in Belgrade.	**2023**

[58] Amendments are needed for industrial processes emissions where the BAT AELs are missing or not addressed in simplified manner

[59] The exact value for dust concentration from Table 3 of the Commission implementing decision 2016/1032/EU needs to be determined based on the concentration levels of heavy metals from copper production processes. Dust emissions are expected to be towards the lower end of the BAT AELs range when emissions of heavy metals are above the following levels: 1 mg/Nm3 for lead, 1 mg/Nm3 for copper, 0,05 mg/Nm3 for arsenic, 0,05 mg/Nm3 for cadmium

No.	Name of measure/activity	Investment Costs [44] [Mio EUR]			Add. budget revenues [45] [Mio EUR]	Source of finance [Mio EUR]			Note	Deadline for implementation
		Investors	Consumers	State		Private sector	EU and other funds[46]	National Budget		
	consumption of solvents and total permissible emissions, as well as emission reduction scheme and enforce its implementation									
	Continue the assessment of the situation of Serbia in terms on emission of VOC from the use of solvents in industry and the preparation of a list of VOC operators, as well as development, testing and start-up of the electronic registration and reporting system for entities classified as VOC operators. Continue capacity building of administration and especially, the training of local inspectors as well as the improvement of knowledge about VOC among operators and consultants.						(0,43)[60]		The Royal Norwegian Embassy in Belgrade financially supports implementation of a project with the grant amounting to € 430,000, while SEPA contributes with € 15,000. The project implementation period is 4 years, staring from 1 December 2018, and closing on 30 November 2022.	2022
	Implement the BAT AELs for plant with consumption of solvents larger than 200 t or 150 kg per hour	125,41					IE (activity above)		Incremental cost for compliance with the directive requirement and additional implementation cost for achieving median of BAT associated emission levels	2025
Specific objective 3: Reduce NH3 emissions from Agriculture sector by 20.5% Compared to 2015										
No.12 (WAM B9)	**Introduction of best practices for slurry storage:**	**0,8**					**0,8**	**3,5**	The cost estimated relates to the investments for covers for pig storage only. There is no cost associated to natural crust.	**2030 and beyond**

[60] Funding by the Royal Norwegian Embassy in Belgrade is already ensured

No.	Name of measure/activity	Investment Costs [44] [Mio EUR]			Add. budget revenues [45] [Mio EUR]	Source of finance [Mio EUR]			Note	Deadline for implementation
		Investors	Consumers	State		Private sector	EU and other funds[46]	National Budget		
A	Transpose the six principles of nitrogen management presented in the Annex III, part 2 of Directive 2284/2016 which are also listed in the Annex IX of the Gothenburg Protocol into national legal framework								While amending national legal framework due to compliance with NEC directive make sure that measures to control NH3 emissions as contained in the Annex III, Part 2.A of the Directive will be transposed in the national legal framework.	2024
A(H)	Prepare a National Advisory Code of Good Agricultural Practices to control NH3 emissions (EU directive 2284/2016 obligation, annex III, part 2), by complementing and extending the existing national Code of Good Agricultural Practices of 2016 to better consider measures to reduce NH3 emissions in line with the UN ECE and EU requirements									2023
A(H)	Establish a national nitrogen budget to monitor the changes in overall losses of reactive nitrogen from agriculture, including NH3, NOx, ammonia, nitrous oxide, ammonium, nitrates and nitrites, based on the principles set out in the UNECE Guidance Document on Nitrogen Budgets [61]						0,8		To be funded by donors (including for measure No13, No.14 and No.15)	2023-2024
(H)	Reinforce human resources of the Ministry of Agriculture, Forestry and Water Management (3 FTE are needed to develop the National advisory Code, organise agricultural advisory services and disseminate the good practices in an integrated approach) and of Agricultural extension services (10 FTE for							2,34	13 additional FTE is estimated to be needed for implementation of this measure and measure (including for measure No13, No.14 and No.15)	2023

[61] UN ECE Executive Body Decision 2012/10/EC, ECE/EB.AIR/113/Add 1.

No.	Name of measure/activity	Investment Costs [44] [Mio EUR]			Add. budget revenues [45] [Mio EUR]	Source of finance [Mio EUR]			Note	Deadline for implementation
		Investors	Consumers	State		Private sector	EU and other funds[46]	National Budget		
	dissemination of ammonia reduction measures and protection of underground water bodies)									
(H)	Inform and disseminate the National Advisory Code of Good Agricultural Practices and develop awareness raising campaigns regarding the impact of NH_3 on air quality and measures to reduce them (through multiple events (5 in Serbia per year from 2024), communication materials ((flyers, videos…): 10) , web site (1))							0,355	Public events done every year in different Serbian regions, communication materials and web site (including for measure No13, No.14 and No.15)	2024-2030
	Implement best practices for slurry storage	0,8							covering storage in pigs IPCC farms and development of a natural surface crust in cattle farms	2024-2030
(H)	Enhance technical capacity of farmers (farm owners and agricultural land owners) on best practices at spreading and other best practices (demonstration farm (1), special training for farmers (15 per year from 2024), development of specific guidance's)							0,778	Training sessions, one demonstration farm, specific guidance (including for measure No13, No.14 and No.15)	2024-2030
(H)	Ensure the finalization of the issuance of integrated permits for IPPC farms based on the use of BAT.							IE (No.1)	Costs included in Measure No.1	2025
	Implementation of the annual survey on the application of the best practice on farms							IE (No. 12)	Costs included in the activity "Enhancing technical capacities of farmers on the best practice in spreading and other best practices".	2024-2030

No.	Name of measure/activity	Investment Costs [44] [Mio EUR]			Add. budget revenues [45] [Mio EUR]	Source of finance [Mio EUR]			Note	Deadline for implementation
		Investors	Consumers	State		Private sector	EU and other funds[46]	National Budget		
No.13 (WAM B8)	**Substitution of urea with ammonium nitrate fertilizer**	**-**					**IE (No.12)**	**IE (No.12)**	There is no investment cost for this measure: only the price difference by type of fertilizer is considered to estimate the cost efficiency of the measure. Annual total cost are in estimated at 5 Mio€	**2030 and beyond**
	See horizontal activities marked with (H) under the Measure No.12						IE(No.12)	IE(No.12)		IE (No.12)
	Implementation of substitution of urea with ammonium nitrate fertilizers	-							Share of urea in the total mineral nitrogen to decrease by to 21,6% while the share of ammonium nitrate in total mineral nitrogen is to increase to 57,8%	2023-2030
No.14 (WAM A11)	**Introduction of the best practices at spreading for solid manure application by faster incorporation of manure in the soil**	**-**					**IE (No.12)**	**IE (No.12)**	For this measure, no investment costs are considered. However, operation costs have been estimated, because contractors will need to be mobilized to incorporate solid manure in many situations, as employed labour and machinery will be fully utilized on other tasks. Therefore annual total cost in year 2030 are estimated at 2.4 Mio€	**2030 and beyond**
	See horizontal activities marked with (H) under the Measure No.12						IE(No.12)	IE(No.12)		IE (No.12)

No.	Name of measure/activity	Investment Costs [44] [Mio EUR]			Add. budget revenues [45] [Mio EUR]	Source of finance [Mio EUR]			Note	Deadline for implementation
		Investors	Consumers	State		Private sector	EU and other funds[46]	National Budget		
	Implement the solid manure application by faster incorporation of manure in the soil	-							For Pig and poultry farms: rapid incorporation within 4 hours and 12 hours For cattle manure: rapid incorporation within 24 hours, 12 hours or 4 hours	2023-2030
No.15 (WAM B7)	**Introduction of best practices at spreading for pig and cattle slurry**	**5,67**					**IE (No.12)**	**IE (No.12)**	The cost estimated relates to the investments for injectors and trailing hose machines. Extra-operational costs are also associated to this measure, but are not presented here.	**2030 and beyond**
	See horizontal activities marked with (H) under the Measure No.12						IE(No.12)	IE(No.12)		IE (No.12)
	Implementation of best practices at spreading for pig and cattle slurry through upgrade of agriculture machinery (injection and trailing hose)	5,67						IE	Strong development of injection and residual application by trailing hose followed by an incorporation within 4 hours or 12 hours through upgrade in Agriculture machinery supported by IPARD Programme	2023-2030
No16 (WAM C3)	**Limitation of the burning of agricultural residues (0% in 2030)**	**46,23**						**0,16**	The cost estimated relates to the investment for machinery in order to incorporate crop residues. Associated operational costs have also been estimated but are not presented here.	**2023-2030 and beyond**

No.	Name of measure/activity	Investment Costs [Mio EUR] 44			Add. budget revenues 45 [Mio EUR]	Source of finance [Mio EUR]			Note	Deadline for implementation
		Investors	Consumers	State		Private sector	EU and other funds 46	National Budget		
[A]	Inform and disseminate the Code for good practices for agricultural residues and develop awareness raising campaigns regarding the agricultural waste burning on air quality and measures to avoid this burning (through multiple events (1 in Serbia per year from 2023), communication materials ((flyers, videos…): 5) , web site (1)).							0,09	Public events done every year in different Serbian regions, communication materials and web site	2023-2030
	Limitation of the open burning of agricultural residues through investment in agriculture machinery in order to incorporate crop residues.	46,23							Upgrade in Agriculture machinery could be additionally supported by IPARD Programme	2023-2030
	Enhance technical capacity of farmers on best practices at harvesting and other best practices (special training for farmers (2 per year from 2023),							0,07	Training sessions, one demonstration farm, specific guidance	2023-2030
Specific objective 4: Promote transition to clean air for everyone										
No.17	**Education on air quality, training for implementation of best practices and awareness raising**	**NA**					**1,0**			**2023-2025**
	Education: implementation of environmental protection and air quality projects and the role of children in its preservation.	NA					0,5		Upgrade of the activities and raising awareness about the health impacts of air pollution. Such activity can be supported by donors	2025
	Capacity building, awareness raising campaigns and support given to the households about the proper use of small appliances using solid fuels and conducting the assessment of the moisture content of the wooden biomass.	NA					IE		Awareness raising media campaigns for households is an important element of the behavior changing process. Activities could be financed through donors	2026

No.	Name of measure/activity	Investment Costs [44] [Mio EUR]			Add. budget revenues [45] [Mio EUR]	Source of finance [Mio EUR]			Note	Deadline for implementation
		Investors	Consumers	State		Private sector	EU and other funds[46]	National Budget		
	Establishing of the mobile demonstration centre (or equivalent) for knowledge sharing regarding the proper use of biomass in small appliances and boilers	NA					1,0		Funding by donors necessary for dissemination and knowledge sharing regarding the proper use of biomass	2026

No.	Name of measure/activity	Investment Costs [Mio EUR][62]			Add. budget[63] revenues [Mio EUR]	Source of finance [Mio EUR]		
		Investors	Consumers	State		Private sector	EU and other funds	National Budget
	Total costs	**642,8**	**1951,9**	**0,0**	**0,0**	**0,0**	**5,5**	**424,2**
	of which Specific objective 1	394,4	1951,9	0,0	0,0	0,0	3,7	420,5
	of which Specific objective 2	195,6	0,0	0,0	0,0	0,0	0,0	0,0
	of which Specific objective 3	52,7	0,0	0,0	0,0	0,0	0,8	3,7
	of which Specific objective 4	0,0	0,0	0,0	0,0	0,0	1,0	0,0
	Cumulative investment costs 2022-2030	**2594,6**						

Dynamics of investments and the most financial significant measures and activities

[62] For the purposes of this assessment, costs are allocated according to who makes the investments, regardless of their capacity to pass costs in the value chain to consumers, and regardless of any public subsidies or incentives they receive. The considered investors could be public and private companies and farmers; consumers are households, and the state is the state budget.

[63] This column is only applicable if the user expresses an intention to introduce the polluter pays principle with the support of the relevant policy framework (environmental fees / recycling fees)

By analyzing the dynamics of planned investments for the purpose of realizing the Programme, a slight increase in investments in 2024 compared to 2023 can be observed, with the planned investments in 2023 and 2024 being the most significant in absolute terms in the entire observed period (2022-2030). The value of investments in those two years alone amounts to 1,393.7 million EUR, that is, 66.4% of the total planned investments. In 2025 and 2026, the amount of investments is significantly reduced to 433.8 million EUR (in 2025) and 272.7 million EUR (in 2026), and after that, in the period 2027-2030, annual investments show a tendency to gradually decrease, so that in 2030 they would amount to 14.5 million EUR.

It should be emphasized that in the period of the most intensive investment activities (2023-2026), private sector investments dominate (88.4%), with 65.8% for consumers and 22.6% for investors. In the period 2023-2026 a smaller part of the investments are investments from the budget of the Republic of Serbia (7.7%) with the largest part referring to financial incentives (7.5%) and the rest to additional administrative and servicing costs (0.2%). The rest of 3.7% are funds planned from credit arrangements with international financial institutions, and 0.2% are funds from EU donations and other funds. In the period 2027-2030, the structure of sources of financing changes so that funds from the private sector record a gradual decrease, while funds from the budget of the Republic of Serbia have a slight tendency of relative growth in total sources of financing.

It was previously mentioned that the largest investments are expected in the first years of the Programme implementation, i.e. in the period until 2024. In this regard, as the most financially demanding, it is possible to single out two measures related to the implementation of Euro standards for used imported vehicles and the renewal of the vehicle fleet by means of financial incentives for the deregistration/shipping of the oldest Euro 1, 2 and 3 diesel passenger vehicles and duty vehicles (except N3), and EURO I, II and III diesel buses to recycling centres.

The participation and importance of the largest investments necessary for the fulfilment of the objectives of the Programme

The Programme defines a large number of measures (17) and activities (49) that need to be implemented in the coming years in order to improve air quality in the Republic of Serbia. Bearing that in mind, through a detailed analysis of individual activities, it is possible to single out certain activities that stand out for their value and importance. The analyzed data indicate the fact that the single largest activity (1,243.4 million EUR) relates to compliance with the updated minimum requirements for passenger cars, duty vehicles and buses and represents 47.7% of the total value of all activities. After the aforementioned, two more activities can be singled out by value: establishment and implementation of a mechanism for financial incentives for the replacement of existing heating devices in households with new eco-designed devices and heat pumps (476.9 million EUR) with a participation of 18.3% and the establishment and implementation of support mechanisms from public funds for the deregistration/disposal of old diesel passenger cars, duty vehicles (except N3) and buses (corresponding to Euro 1, Euro 2, Euro 3 and Euro I, Euro II and Euro III) to recycling centres (453.6 million EUR), which participates in total investments with 17.4%.

The previously mentioned three activities have a total value of 2,173.9 million EUR and they participate in total investments with 83.4% which indicates a particularly high concentration of investments in a small number of activities and highlights the importance that these activities, that is, their implementation, have on the success of the implementation of the Programme. The value of the other 46 activities amounts to 433.5 million EUR and represents only 16.6% of the total value of investments.

Also, it is important to note that the analysis of the value and dynamics of the realization of individual activities indicates the fact that it is expected that, if the dynamics of the planned investment activities are respected, the activities of the highest value will be completed by the end of 2026 (78.4%) and that the remaining part of lower value activities (21.6%) will be completed by the end of 2030. This time distribution of investments indicates the fact that the risk for the successful implementation of the Programme is present to the greatest extent in the initial years of the Programme's implementation (from 2023 to 2026), but this does not mean that this risk should be underestimated in the following years.

Financing of activities from the Budget of the Republic of Serbia

By looking at the structure of sources of financing activities defined by the Programme, it can be concluded that the planned funds from the Budget of the Republic of Serbia in the period 2023-2026 (161.34 million EUR) participate with 7.7% in the total sources of financing of all activities. Three types of expenses can be allocated within the budget funds:

1) financial incentives;
2) additional administrative costs;
3) additional servicing costs.

Financial incentives represent the most significant type of costs with a share of 98.3%, while additional administrative costs and additional servicing costs have a much smaller share in the overall budget funds, i.e. 1% and 0.7%, respectively. Analysis of the dynamics of the use of budget funds in the period 2023-2026 shows that the largest share of budget funds in the total sources of financing is expected in 2025 and relates to financial incentives for the renewal of the vehicle fleet (33.8% in 2025) and in the following years it is expected to decrease both in absolute terms and in a relative sense. Financial incentives as the dominant budget expense (236.34 million EUR) refer to the two most significant activities:

1) establishment and implementation of support mechanisms from public funds for the deregistration/disposal of old diesel passenger cars, duty vehicles and buses (except N3) that correspond to Euro 1, Euro 2, Euro 3 and Euro I, Euro II and Euro III to recycling centres (158.6 million EUR);

2) establishment and implementation of mechanism for financial incentives for the replacement of existing heating elements in households with new eco-designed devices and heat pumps (77.74 million EUR).

The share of budgetary sources in the total sources of financing, in a relative sense, depends on the value and dynamics of private sector investments as the largest source of financing of the activities included in the Programme. Observed in absolute terms, budget allocations in 2022 are not foreseen. Funds for the implementation of the Programme in 2023 will be provided within the limits determined by the Budget law, for the authorities that implement the Programme activities. The largest allocations from the budget are expected in 2025 (146.6 million EUR).

The structure of sources of financing of total investments

The total investment value of all activities of the Programme is 2,607.38 million EUR, and the sources for their financing can be divided into three groups:

1) Private sector;
2) Budget of the Republic of Serbia;
3) EU and other funds (donor funds).

A more detailed look at the structure of financing sources shows that the private sector has a dominant role in financing activities with a share of 83.5% in total financing sources (2,177.65 million EUR). Two categories can be distinguished within the private sources of financing: 1) consumers and 2) investors.

Consumers represent a significant source of financing with a share of 58.9% (1,534.90 million EUR), while investors participate in the total sources of financing with 24.6% (642.75 million EUR). The single most significant activity to be funded by consumers relates to compliance with the updated minimum requirements for passenger vehicles, duty vehicles and buses. The value of this activity amounts to 1,102.76 million EUR, which represents 72% of the value of investments financed by consumers.

The total value of the activities that are the subject of financing by investors amounts to 642.75 million EUR, and within this category of sources of financing there is a large number of activities (6) whose values range from 46.23 million EUR to 140.64 million EUR and together they represent 90% of the value of investments financed by investors.

The budget of the Republic of Serbia participates with 6.4% in the total sources of financing of the Programme activities and represents a significant source of financing for the activities. As previously mentioned, three types of costs can be distinguished within the budget funds, which differ significantly in terms of value and participation in the total budget funds: financial incentives (98.3%), additional administrative costs (1%) and additional service costs (0.7%).

For the measure related to the replacement of existing heating devices in households with new devices that meet the requirements of the Eco-design Directive with financial incentives (258 million EUR), partial financing is provided with funds from loans from international financial organizations.

In addition to the previously mentioned activities, which, in financial terms, are significantly more demanding, there are certain activities whose implementation is necessary, and which are mostly aimed at providing professional assistance and support in various areas (legal, administrative and technical issues, educational campaigns, promotional activities, etc.). The mentioned activities are financed to a significant extent with the help of financial resources of the EU and other funds (donor funds). The Air Protection Programme defined the value of funds for financing of 13 activities by the EU and other funds in the amount of 5.51 million EUR, which is 0.2% of the total funding sources for all activities.

The value of individual activities financed by the EU and other funds ranges from 10,000 to 1,000,000 EUR, and the implementation of these activities covers the time period from 2022 to 2027.

Table 7-7: **Aggregated investment costs and costs for state and donors for the period 2022-2030 in Mio EUR, 2022-2030, constant 2021 price**

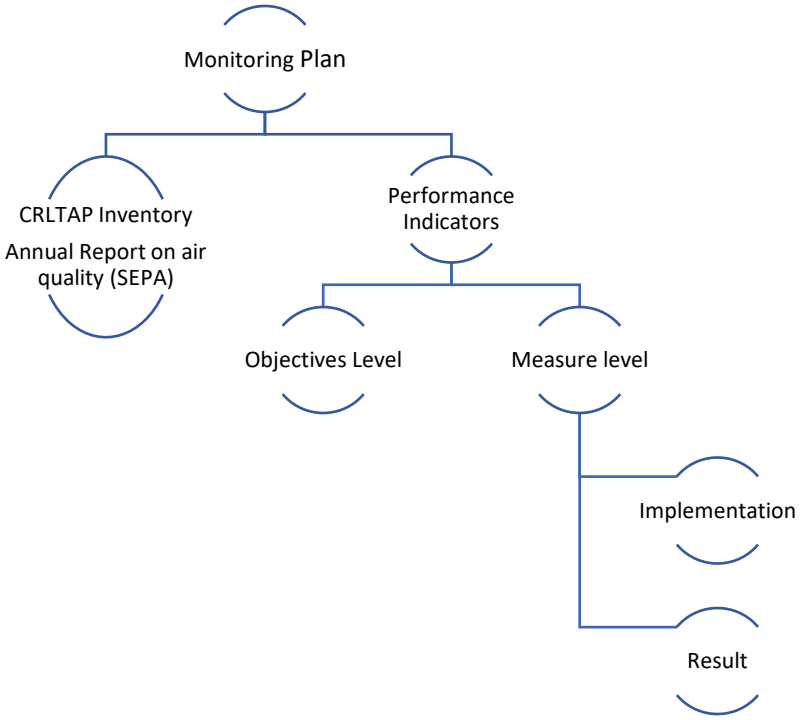
Category	Investment costs			Other implementation costs			total
	Investors	Consumers	Total	State	Donors	Total	costs
Investment costs - investors	642,75	1951,86	2594,61				2594,61
Financial incentives (from the State budget)	0,00	-416,96	-416,96				-416,96
Net Investment costs	642,75	1534,90	2177,65				2177,65
Financial incentives				416,96	0,00	416,96	416,96
Additional administrative costs				5,94	0,00	5,94	5,94
Additional services costs				1,32	0,00	1,32	1,32
Additional funding				0,00	5,51	5,51	5,51
total implementation cost	**642,75**	**1534,90**	**2177,65**	**424,22**	**5,51**	**429,73**	**2607,38**

8 FRAMEWORK FOR MONITORING AND REPORTING ON THE PROGRAMME IMPLEMENTATION

Responsible authorities and organisations shall be obliged to carry out an assessment of effects of their PaMs on the air pollutant emissions level and shall report to the MEP.

In this context, monitoring of implementation of specific measure will be done by the responsible institution and report to the Ministry. Implementation of the measure will be monitored by the CRLTAP inventory, Air Quality Monitoring Network and a set of indicators. (Figure 28)

Figure 28: Monitoring framework



In accordance with the Article 43 of the Law on the Planning System of the Republic of Serbia, MEP will report to the Government, on results of the implementation of the Programme, no later than 120 days upon the expiry of every third calendar year from its adoption, and by means of the final report submitted no later than six months from the expiry of its validity.

The performance indicators at the level of general and specific objectives are presented in the *Table 8-1* while the monitoring of the measures at the level of activities are presented in *Table 8-2*.

*Table 8-1**: Indicators at the level of the general and specific objectives***

Elements of the Programme	Indicator	Baseline Value	Target Value	Source of verification
		2015	2030	
General Objective: *To reduce up to 2030 the health damage due to poor air quality by half compared to 2015 by reducing exposure to air pollution while aligning the Republic of Serbia with the European Union's regulatory limits to air pollution and limiting the damage on ecosystems*	Share of air quality measuring points in which daily limit value of 50 µg/m3 for PM_{10} (%) was exceeded more than 35 times in one calendar year	83	0	Annual report on Air Quality in Serbia (SEPA)
	Share of air quality measuring points in which yearly limit value for PM_{10} (%) was exceeded	75	0	Annual report on Air Quality in Serbia (SEPA)
	Number of days when the limit value for CO2 in Bor for the averaging period was exceeded one day	139	<3	Annual report on Air Quality in Serbia (SEPA)
	Average annual concentration level of Arsenic in Bor (ng/m^3)	(NE)[64]	6	Annual report on Air Quality in Serbia (SEPA)

[64] Average annual concentration level of Arsenic in Bor in 2020 was between 8 ng/m^3 (measuring station: Bor Krivelj) and 277 ng/m^3 (measuring station Bor: Jugopetrol)

Elements of the Programme	Indicator	Baseline Value	Target Value	Source of verification
		2015	2030	
	Average annual concentration level of Cadmium in Bor (ng/m^3)	(NE)[65]	5	Annual report on Air Quality in Serbia (SEPA)
	Average annual concentration level (AEL) of $PM_{2.5}$	-	<20	Air Quality in Europe (EEA) (SEPA) Annual report on Air Quality in Serbia (SEPA)
	Premature deaths due to $PM_{2.5}$ exposure, as one of the environmental risk factors	9773	5401	Air Quality in Europe (EEA)
Specific objective 1: *Specific objective 1: Reduce emissions of SO_2 by 92% and fine particles $PM_{2.5}$ by 58.3% from Energy sector (including traffic and residential combustion) in 2030 compared to 2015*	Total SO_2 emissions from Energy sector ($ktSO_2$)	365,5	29,2	National CRLTAP Inventory report - SEPA (NFR code A to D and F to I)
	Total $PM_{2.5}$ emissions from Energy sector ($ktPM_{2.5}$)	46,9	21,5	National CRLTAP Inventory report - SEPA (NFR code A to D and F to I)
Specific objective 2: *Specific objective 2: Reduce emission of air pollutants and heavy metals from*	Share of Industrial processes Installations in full compliance with	(15%)	100%	MEP (IPCC permits data)

[65] Average annual concentration level of Cadmium in 2020 in Bor was between 8 ng/m^3 (measuring station: Bor Gradski Park) and 37 ng/m^3 (measuring station Bor: Jugopetrol)

Elements of the Programme	Indicator	Baseline Value	Target Value	Source of verification
		2015	2030	
Industrial processes and product use through compliance with BAT AELs	mid-range BAT AELs taking into consideration air quality in zones and agglomerations			
	Copper smelting installation compliant with lower values of the BAT AELs for the production of copper for SO_2	>50 mg/Nm3	50 mg/Nm^3	MEP (IPCC permits data)
	Sulphuric acid production installation compliant with lower values of the BAT AELs of 100 mg/Nm^3	>100 mg/Nm3	100 mg/Nm3	MEP (IPCC permits data)
	Emissions of particulate matters (mg/Nm3) from copper production in accordance with the Table of the Commission	>2-5	2-5	MEP (IPCC permits data)

Elements of the Programme	Indicator	Baseline Value	Target Value	Source of verification
		2015	2030	
	Implementing Decision 2016/1032/EU.			
Specific objective 3: *Specific objective 3: Reduce NH3 emissions from Agriculture sector in 2030 by 20.5% Compared to 2015*	Total NH_3 emissions [$ktNH_3$] from Agriculture sector	72,3	60,7	National CRLTAP Inventory report - SEPA (NFR code K and L)
Specific objective 4: *Promote transition to clean air for everyone (through awareness projects)*	Implemented awareness-raising activities among stakeholders regarding air pollution and its potential impacts on society	No	Yes	Monitoring and evaluation plan of the awareness raising activities
	Share of households informed on proper use of fuelwood in small appliances (%)	-	80	Monitoring and evaluation plan of the awareness activities
	Share of zones and agglomeration visited by mobile demonstration centre (or equivalent demonstration concept) (%)	-	100%	Monitoring and evaluation plan of the awareness activities

Table 8-2: **Monitoring for implementation of measures**

No.	Name of measure/activity	Regulation /PPP that need to be adopted/amended to implement the measures	Performance indicator	Source of data	Base value [2015]	Target value [year]
Specific objective 1: Reduce emissions of SO_2 by 92% and fine particles $PM_{2.5}$ by 58.3% from Energy sector (including traffic and residential combustion) in 2030 compared to 2015						
No.1 (WAM B1)	**Enforcement of the Chapter II of the EU Directive Industrial emissions for Large Combustion Plants with consideration of the mean of upper and lower levels of BAT AELs**	Amended national legislation (Law on IPCC, Law on waste management, Air Protection), and relevant by laws, capacity building (additional employments)	Integrated permits issued/amended, taking into account BAT AELs limit values and air quality in zones and agglomerations, in order to implement Chapter II of the EU Directive on Industrial Emissions for Large Combustion Plants.	IPCC permit statistics	-No	Yes All LCP installations have permits aligned with BAT AELs [2030]
[A][66]	Ensure the full alignment of the legislation of the Republic of Serbia with the IED for LCP covered in its annex I Amendments to the bylaws [67]	-	Law on IPCC and listed bylaws and Rulebooks amended	DSIP 2010/75/EU implementation plan	-No	Yes [2023]
	Ensure that the increase of human resources of Serbian institutions in order to deal with issuing IPPC permits, has been done as this was established in the DSIP for the IED (Project IED Serbia) : MEP - Department for integrated permits : 4 working	-	Administrative Capacity at MEP and Autonomous Province of Vojvodina enhanced	DSIP 2010/75/EU implementation plan	0	11 additional administrative capacities at MEP and 2 at AP Vojvodina established [2025]

[66] Notation key "A"= Normative activity linked to transposition of relevant EU legislation

[67] Amendments are needed for industrial processes emissions where the BAT AELs are missing or not addressed in simplified manner

No.	Name of measure/activity	Regulation /PPP that need to be adopted/amended to implement the measures	Performance indicator	Source of data	Base value [2015]	Target value [year]
	places, permit writers, fulfilment vacant positions; 6 working places with technical competences (gradual increase of number of employees within this unit in mid-term perspective) and 1 working place with legal competences AP Vojvodina (Provincial Secretariat for Urban Planning and Environmental Protection): 2 working places, permit writers, 1 working place with legal competences MEP: IED Chapter III : 1 working place with specialization in LCP IED chapter IV: 1 full time working place specialized for waste incineration chapter IED chapter V: 1 working place, officer with a background in chemical engineering SEPA: IED chapter V: 1 officer with a background in chemical engineering					
	Ensure that all large combustion installations, are compliant their updated IPPC permits.	-	Number of permit issued	DSIP 2010/75/EU implementation plan		All LCP installations have permits aligned with BAT AELs [2030]
	Ensure that all IED plants report to the National Register of Pollution Sources (which fills the E-PRTR). Set up a programme for checking the quality and consistency of air emission reports to the National Register of Pollution Sources (The consistency and accuracy of emission reports need to be checked by local inspectors and then also controlled by SEPA, before being published and made public. Moreover, the data reported could be used	-	Quality Assurance and Quality Control (QA/QC) established to link E-PRTR with CRLTAP inventory	CRLTAP inventory report	**-0%**	Yes [2027]

No.	Name of measure/activity	Regulation /PPP that need to be adopted/amended to implement the measures	Performance indicator	Source of data	Base value [2015]	Target value [year]
	as input data for the emission inventory to increase its accuracy (higher tier methods used instead of default limit values)).					
No.2 (WAM A2)	**Implementation of EU Directive 2015/2193 on the limitation of emissions of certain pollutants into the air from medium combustion plants**	Amended national legislation (Law on Air protection), institutional enforcement (additional employments)	Share of medium combustion plants compliant with EU Directive 2015/2193 on the limitation of emissions of certain pollutants into the air from medium combustion plants	SEPA Register of medium combustion plants	-0%	100% All MCP installations have emissions aligned with EU Directive 2015/2193 [2030]
[A]	Finalise of the full alignment of the national legislation with the MCPD, by: - Adopting a Regulation on emission limit values of pollutants in the air from medium combustion plants. This regulation will need to merge the requirements of the MCPD and of the national regulation on emission limit values of pollutants in the air from combustion plants. When the national regulation implements stricter ELVs than the MCPD, they must be kept. The stricter limit values of the MCPD must be transposed as well as any stricter requirement.	-	Regulation on emission limit values of pollutants in the air from medium combustion plants	Annual Progress monitoring report	-No	Yes [2024]
	In order to ensure implementation of the requirements of the MCPD: - Continue analysing current available data on MCPs; - Complete a database to contain the total number of	-	Establish a reporting system and database	SEPA	-No	Yes [2024]

No.	Name of measure/activity	Regulation /PPP that need to be adopted/amended to implement the measures	Performance indicator	Source of data	Base value [2015]	Target value [year]
	MCPs; - Establish a reporting system and database (Art. 11)[68].					
	Compliance of medium combustion plans with limit values	-	Additional yearly inspection of MCP in Belgrade, Kragujevac, Niš, Valjevo, Užice	MEP Annual Report of Inspectorate of Environment	-No	Yes [30]
	Ensure an increase of human resources of Serbian institutions in order to deal with the MCPD (but also other size of installations such as SCP and domestic appliances): MEP : 2 working places with specialization in MCPD (but also SCP and domestic appliances) AP Vojvodina (Provincial Secretariat for Urban Planning and Environmental Protection): 1 working place with specialization in MCPD (but also SCP and domestic appliances) SEPA: MCPD : 1 officer to deal with MCPs (but also SCPs and domestic heating appliances)	-	Number of additional administrative capacities at MEP, SEPA and Autonomous Province of Vojvodina	MEP, SEPA and AP Vojvodina	0	2, 1 и 1 [2025]
No.3 (WAM A3)	**Implementation of the Regulation on emission limit values for polluting matters into the air from combustion plants in the part related to small plants with small combustion plants (capacity up to 1 MW), and which are not subject to the Ecodesign Directive**	Amended legislation to lower emission limit values for small combustion plants	Share of small combustion plants not subject to the Ecodesign Directive in accordance with the lower emission	Inspectorate of MEP	-0%	100% All SCP installations have emissions aligned with lower emission limit values [2030]

[68] In the scope on the ENVAP 3 project (funded by the Swedish International Development Cooperation Agency (SIDA) and carried out by the Swedish Environmental Protection Agency for the period 2016-2021) assisting Serbia and MEP in preparing to negotiate and comply with Chapter 27 Environment requirement, a preliminary assessment of current situation regarding total number of medium combustion plants in the Republic of Serbia has been made. This assessment needs to be consolidated and the database established.

No.	Name of measure/activity	Regulation /PPP that need to be adopted/amended to implement the measures	Performance indicator	Source of data	Base value [2015]	Target value [year]
			limit values from the Regulation on emission limit values for polluting matters into the air from combustion plants in the part related to small combustion plants (capacity up to 1 MW			
[A][4]	Update emission limit values for small combustion installations with a capacity of less than 1 MW (boilers or stationary engines)	-	Regulation on emission limit values of pollutants in the air from combustion plants amended	MEP Annual Progress monitoring report	-No	Yes [2023]
	Ensure compliance is stricter emission limit values for small combustion installations not subject to the Ecodesign Directive	-	Additional annual inspections of small combustion plants in Belgrade, Kragujevac, Nis, Valjevo and Uzice	Annual SCP emission reports	-No	Yes [2025-2030]
No.4 (WAM B4)	**Enforcement of minimum Euro standards for second-hand vehicles imported: Euro 5/V from 1st January 2024 and Euro 6/VI from 1st January 2025**	Regulation on the import of motor vehicles	Implemented minimum standards for imported used vehicles: Euro 5/V from 1 January 2024 and Euro 6/VI from 1 January 2025	Annual Progress monitoring report	No	Yes (First registration in Serbia permitted only for vehicles EURO 6/VI or newer)
A	Amend the Regulation on the import of motor vehicle standards for imported passenger cars, duty vehicles, and		Regulation on Regulation on the	Annual Progress	-No	Yes [2023]

No.	Name of measure/activity	Regulation /PPP that need to be adopted/amended to implement the measures	Performance indicator	Source of data	Base value [2015]	Target value [year]
	busses. The minimum standards are Euro 5/V from 1st January 2024 and Euro 6/VI from 1st January 2025.		import of motor vehicle amended ("Official Gazette of the Republic of Serbia", No. 23/2010 and 5/18).	monitoring report		
	Compliance with updated minimum requirements for passenger cars, duty vehicles and busses		No. of second hand EURO 3 vehicles first time registered in Serbia	SEPA COPERT vehicles database (based on Ministry of nterior data)	Euro 3/III – 127.325 [2015] Euro 4/IV – 55.701 [2015]	Euro 3/III - 0 [2024] Euro 4/IV – 0 [2025]
No.5 (WAM B5)	**Additional vehicle fleet renewal due to financial incentives for scrapping oldest Euro 1, 2 and 3 diesel passenger cars and duty vehicles (except N3) and for EURO I, II and III diesel busses.**	Financial incentive for phasing out vehicles with poor environmental performance	Number of registered vehicles sent for deregistration / recycling centers through the incentive scheme	Ministry of finance	0 vehicles sent for deregistration into recycling centers	140.200 vehicles sent for deregistration into recycling centers and 453Mio€ distributed
	Prepare and adopt an end-of life vehicle management plan and enhance the vehicles recycling centers		Number of vehicles sent to deregistration into recycling centres	Recyclers associatio n of Serbia	0 vehicles sent to deregistration into recycling centres	140.200 EURO 3/III and other vehicles sent to deregistration into recycling centres
	Set up and implement the public financial support mechanism for the scrapping of old diesel passenger cars, duty vehicles (except N3) and busses (respectively Euro 1, Euro 2, Euro 3 and Euro I, Euro II and Euro III).		The amount of incentive distributed	Ministry of Finance	0 Mio€	453,1 Mio€ in total for the period2024-2026 [2026]

No.	Name of measure/activity	Regulation /PPP that need to be adopted/amended to implement the measures	Performance indicator	Source of data	Base value [2015]	Target value [year]
	Amendments to the Law on tax on the use, possession and carrying of goods, in the part relating to the use of motor vehicles		Revenues collected through amendments to the Law on tax on the use, possession and carrying of goods	Ministry of Finance	0 Mio€	[2030]**[69]
No.6 (WAM A6)	**Enforcement of regulation (EU) 2016/1628 on requirements relating to gaseous and particulate pollutant emission limits and type-approval for internal combustion engines for non-road mobile machinery, amending Regulations (EU) No 1024/2012 and (EU) No167/2013, and amending and repealing Directive 97/68/EC**	Amend the national legislations for NRMM and phasing out of old NRMM	Share of vehicles in accordance with the regulations on NRMM - implementation of Regulation (EU) 2016/1628 on requirements relating to emission limit values for gaseous particulate pollutant emission limits and type-approval for internal combustion engines for NRMM, amending Regulations (EU) No. 1024/2012 and (EU) No. 167/2013, and replacing Directive 97/68/EC	SEPA COPERT Database (for registered tractors), IPARD programe monitoring plan	0% of Agricultural and industrial NRMM compliant [2015]	40% of Agricultural and industrial NRMM compliant with the Directive 2016/1628/EU

[69] means that the revenues will be defined at a later stage depending on the beginning of the implementation of that measure.

No.	Name of measure/activity	Regulation /PPP that need to be adopted/amended to implement the measures	Performance indicator	Source of data	Base value [2015]	Target value [year]
A	Finalise the work programme for full alignment of the national legislation with the regulation 2016/1628 through the Rulebook on emission limit values of gaseous and particulate pollutants and homologation of internal combustion engines for NRMM).		Rulebook on emission limit values of gaseous and particulate pollutants and homologation of internal combustion engines for NRMM amended	MEP Annual Progress monitoring report	-	Yes [2024]
	Ensure an increase of human resources of Serbian institutions in order to deal with the NRMM (but also road traffic and other traffic modes): MCTI: 1 working place with specialization in NRMM (but also road traffic and other traffic modes) MCTI: 1 officer to deal with NRMM (but also road traffic and other traffic modes)		Number of additional administrative capacity at MCTI	MCTI	0	2 [2025]
	Implementation of on emission limit values of gaseous and particulate pollutants and homologation of internal combustion engines for off-road mobile machinery		Percentage of older agricultural machinery and other non-road mobile machinery phased out	SEPA COPERT Database (for registered tractors), IPARD programme monitoring plan	0% [2015]	40% [2030]
No.7 (WAM C1)	**Faster replacement of existing domestic heating appliances - household space heaters with new Eco-Design compliant appliances with financial incentives and larger share of replacement in the cities of Kragujevac, Beograd, Nis, Valjevo and Užice**	Transposition and implementation of ECO-design Regulation 2015/1189/EU and Regulation 2015/1185/EU and setting up incentive	The amount of financial incentives for faster replacement of home heaters with new eco-designed	Ministry of finance through the incentives statistics	-	476,90 Mio€ of financial incentives delivered of which for the Republic of Serbia 159.8 million EUR, to Kragujevac 5,6Mio€, Belgrade

No.	Name of measure/activity	Regulation /PPP that need to be adopted/amended to implement the measures	Performance indicator	Source of data	Base value [2015]	Target value [year]
		support infrastructure for delivering incentives for penetration of Eco-design devices and heat pumps	appliances and heat pumps, with a higher percentage of replacement			36,6Mio€, Niš 25,9mio€, Valjevo 13,9Mio, Užice 13,6Mio€
A	Finalise the work for full alignment of the national legislation with the Eco-design directive (see report 3.1, chapter 3.4.2) and work in order the two following regulations are transposed: Regulation 2015/1189 of 28 April 2015 implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to Eco-design requirements for solid fuel boilers. Regulation 2015/1185 of 24 April 2015 implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to Eco-design requirements for solid fuel local space heaters.		Transposition of ECO-design Regulation 2015/1189/EU and Regulation 2015/1185/EU	Annual Progress monitoring report	-No	Yes [2023]
	Establish and implement a mechanism for financial incentives for replacement of existing domestic heating appliances with new appliances Eco-Design compliant and heat pumps.	-	Phasing out of old technology and replacing old technology with ECO-label devices and heat pumps	-	-	- Kragujevac at least 58% of the appliances shall be replaced with Eco-label appliances of which at least 25% of pellet appliances - Belgrade at least 58% of the appliances shall be replaced by only pellet appliances - Valjevo and Nis at least 74% of the appliances shall be replaced by up to 50% of pellet appliances

No.	Name of measure/activity	Regulation /PPP that need to be adopted/amended to implement the measures	Performance indicator	Source of data	Base value [2015]	Target value [year]
						and 50% or more of heat pumps - Užice at least 80% of appliances shall be replaced by 85% or more of heat pumps and up to 15% with pellet appliances
	Facilitate the mechanism of financial incentives by ensuring additional 15 FTE in the aim to inform the public on how to reduce emissions from domestic heating appliances and facilitate the access to financial support..	-	Number of additional Administrative Capacities at MME	Ministry of Mining and Energy	0	6 people employed
No.8 (WAM A7)	**Enforcement of the amended fuel quality Directive 2009/30/EC and Directive 2016/802/EC on the reduction of the Sulphur content of certain liquid fuels**	Transposition and implementation of Directive 2009/30/EU as amended	Share of ultra-low sulfur liquid fuels into the Serbian market in accordance with the Directives	Final and annual report on the implemented monitoring of the quality of oil derivatives	No ultra low sulfur liquid fuels available on Serbian market -	100% liquid fuels put on the market compliant with directive requirements [2025]
A	Finalise the work programme for full alignment of the national legislation with the fuel quality Directive 2009/30/EC (FQD) and Directive 2016/802/EU on the reduction of the Sulphur content of certain liquid fuels[70].		Transposition of Directive 2009/30/EC (FQD) and directive 2016/802/EU on the reduction of the	Final and annual report on the implement	-No	Yes [2025]

[70] Two DSIPs in the scope of the EAS3 project, have been developed and detail list of the Laws, Regulations and Rulebooks to be amended.

No.	Name of measure/activity	Regulation /PPP that need to be adopted/amended to implement the measures	Performance indicator	Source of data	Base value [2015]	Target value [year]
			Sulphur content of certain liquid fuels	ed monitoring of the quality of oil derivatives		
	Investments needed to ensure compliance with Fuel quality Directive and on the reduction of the Sulphur content of certain liquid fuels.		Amount of investment in deep processing unit in Pančevo Oil Refinery[71]	DSIP_SC, and Directive on sulfur content in certain liquid fuels, monitoring plan	388 Mio€	807Mio€][72]
	Increase the human resources of institutions: 2 FTE for monitoring of directive implementation		Number of additional administrative capacities at the Ministry of Mining and Energy	Ministry of Mining and Energy	-	[2025]
No.9 (WAM A8)	**Limiting VOC emissions by implementing the requirements of VOC Petrol Directives 94/63/EC (Stage I) and 2009/126/EC (Stage II) collecting petrol vapours**	Transposition and implementation of Directives 94/63/EC (stage	Share of infrastructure in accordance with	MME Annual Progress	Chain of petrol distribution not compliant with	100% service-stations covered by the EU directives and petrol

[71] Investments in the plant "Deep refining", reconstruction of FFC and construction of ETBE in the Pancevo Oil Refinery.

[72] Directive Specific Implementation Plan (DSIP) for the Directive 2016/802/EU of the European Parliament and of the Council of 11 May 2016 relating to a reduction in the Sulphur content of certain liquid fuels and DSIP for the Directive 98/70/EC Directive 98/70/EC of the European Parliament and of the Council of 13 October 1998 relating to the quality of petrol and diesel fuels and amending Directive 93/12/EEC. Investments in the plant "Deep Refining" (333 million euros), reconstruction of FFC and construction of ETBE in the Pancevo Oil Refinery (86 million euros). A total of an additional 419 million euros.

No.	Name of measure/activity	Regulation /PPP that need to be adopted/amended to implement the measures	Performance indicator	Source of data	Base value [2015]	Target value [year]
	from the storage and transport of petrol and refuelling motor vehicles at petrol stations	I) and 2009/126/EC (stage II)	Directive 94/63/EC on the control of emissions of volatile organic compounds (VOCs) as a result of petrol storage and distribution from terminals to service stations (Phase I) and Directive 2009/126/EC on the collection of petrol vapor when refueling motor vehicles at petrol stations (Second phase)	monitoring report SEPA	directives requirements	storage facilities compliant; the whole chain of petrol distribution compliant [2028]
A	Finalise of the legal transposition plan for the Directives 1994/63/EC and 2009/126/EC[73]		Full transposition of Directives 1994/63/EC and 2009/126/EC	Annual Progress monitoring report	- No	Yes [2022]
	Increase human resources in SEPA and MEP for implementation of the Directives		Number of additional administrative capacities at SEPA and MEP	SEPA MEP	-	Yes [2025]
	Implement vapour capture in the gasoline supply, distribution and transport system		Implementation of Directives	SEPA	No	Yes [2028]

[73] Legal transposition will require amendments to the Law on Air Protection; Rulebook on technical measures and requirements in relation to allowed emission factors for volatile organic compounds resulting from the storage and transport of petrol (Hereinafter: VOC Petrol Rulebook); Rulebook on methodology for preparation of national and local register of pollution sources, as well as methodology for types, methods and deadlines of data collection (National Register of Pollution Sources- NRPS) (Hereinafter: Rulebook of NRPS)

No.	Name of measure/activity	Regulation /PPP that need to be adopted/amended to implement the measures	Performance indicator	Source of data	Base value [2015]	Target value [year]
			1994/63/EC and 2009/126/EC			
Specific objective 2: Reduce emission of air pollutants and heavy metals from Industrial processes and product use through compliance with BAT AELs						
No.10 (WAM C2)	**Enforcement of the Chapter II of the EU Directive Industrial emissions for industrial processes with consideration of the mean of upper and lower levels of BAT AELs and the lower levels for the plants of copper production and Sulphuric acid production in Bor**	ELVs based on BAT AELs of BAT Conclusions (IED chapter II) For plants not covered by IED Chapter II	Reduction of SO2 and particulate matter emissions from specific industrial processes	Annual report on continuous emission measurements (SEPA)	Limit value of SO2 emission of 350 mg/Nm^3 And sulphuric acid production of 120 mg/Nm^3 [2015] Emission limit value for particulate matter for copper production higher than 2-5 mg / Nm3 [2015	Implemented emission limit value for particulate matter for copper production in the range 2-5 mg/Nm3 [2029]
	Ensure that all large industrial plants covered by annex I of the IED, have their IPPC permits issued and comply relevant BAT AELs.- Amendments to the Regulation on limit values of emissions of air pollutants from stationary pollution sources, excluding combustion plants (OGRS N°111/15)[74]		Amendments to the Regulation on limit values of emissions of air pollutants from stationary pollution sources, excluding combustion plants (OGRS N°111/15)[75].	MEP Annual Progress monitoring report		Regulation on limit values of emissions of air pollutants from stationary pollution sources, excluding combustion plants amended [2023]
	Ensure compliance with BAT AELs for industrial emissions taking into account air quality in zones and agglomerations and in addition lower SO_2 values of the BAT AELs for the production of copper of 50 mg/Nm^3 and		SO_2 emission limit value from copper production	Annual report on continuous	Limit value for the production of copper of 350 mg/Nm^3	the BAT AELs for the production of copper of 50 mg/Nm^3

[74] Amendments are needed for industrial processes emissions where the BAT AELs are missing or not addressed in simplified manner

[75] Amendments are needed for industrial processes emissions where the BAT AELs are missing or not addressed in simplified manner

No.	Name of measure/activity	Regulation /PPP that need to be adopted/amended to implement the measures	Performance indicator	Source of data	Base value [2015]	Target value [year]
	100 mg/Nm^3 for the Sulphuric Acid production and lower BAT AELs for dust for copper production as contained in Table 3 of the Commission implementing decision 2016/1032/EU[76].			emission measurements	And sulphuric acid production of 120 mg/Nm^3 [2015]	and 100 mg/Nm^3 for the Sulphuric Acid production implemented [2024] and dust limit values alligned with Table 3 of the Commission implementing decision 2016/1032/EU
No.11 (WAM B6)	**Enforcement of the IED Chapter V, Annex VII for VOC or chapter II for plants with a consumption of solvents larger than 200 t or 150 kg per hour**	ELVs based on BAT AELs of BAT Conclusions (IED chapter V) For plants not covered by IED Chapter V	Reduction of emissions in order to implement Chapter V of the Industrial Emissions Directive, Annex VII for VOCs or Chapter 2 for installations where solvent consumption exceeds 200 t per year or 150 kg/h	Electronic registration and reporting system MEP SEPA	0	VOC emission reduction by 2030 for 4,15kt of VOC
A	Amend Regulation on limit values of emissions of air pollutants from stationary pollution sources, excluding combustion plants and Regulation on the list of industrial installations and activities in which volatile organic compounds emissions are controlled, values of emission of volatile organic compounds under specific consumption		Amendments to the Regulation on the list of industrial plants and activities in which the emission of volatile organic	MEP Annual Progress monitoring report SEPA	-No	Yes [2023]

[76] The exact value for dust concentration from Table 3 of the Commission implementing decision 2016/1032/EU needs to be determined based on the concentration levels of heavy metals from copper production processes. Dust emissions are expected to be towards the lower end of the BAT AELs range when emissions of heavy metals are above the following levels: 1 mg/Nm3 for lead, 1 mg/Nm3 for copper, 0,05 mg/Nm3 for arsenic, 0,05 mg/Nm3 for cadmium

No.	Name of measure/activity	Regulation /PPP that need to be adopted/amended to implement the measures	Performance indicator	Source of data	Base value [2015]	Target value [year]
	of solvents and total permissible emissions, as well as emission reduction scheme and enforce its implementation		compounds is controlled, on the values of emission of volatile organic compounds at certain solvent consumption and total allowable emissions, as well as emission reduction schemes,.			
	Continue the assessment of the situation of the Republic of Serbia in terms on emission of VOC from the use of solvents in industry and the preparation of a list of VOC operators, as well as development, testing and start-up of the electronic registration and reporting system for entities classified as VOC operators. Continue capacity building of administration and especially, the training of local inspectors as well as the improvement of knowledge about VOC among operators and consultants.		Setting up electronic registration and reporting system	MEP Annual Progress monitoring report SEPA	-NO	Yes [2023]
	Implement the BAR AELs for plant with consumption of solvents larger than 200 t or 150 kg per hour		Reduction of VOC emissions from specific industrial activities (kt)	Electronic registration and reporting system	0 [2015]	4,15kt VOC [2030
Specific objective 3: Reduce NH3 emissions from Agriculture sector by 20.5% Compared to 2015						
No.12 (WEM B9)	**Introduction of best practices for slurry storage:**	Pig manure cover storage and Dairy cows natural crust	Share of the pig manure covered storage and share of	Annual survey by agriculture	0,5% pig manure covered storage and 0,7%of natural crust in total dairy cow slurry	1,9% pig manure covered storage and 3.3% of natural crust

No.	Name of measure/activity	Regulation /PPP that need to be adopted/amended to implement the measures	Performance indicator	Source of data	Base value [2015]	Target value [year]
			natural crust in the total dairy cow slurry	advisory service		natural crust in total dairy cow slurry
A	Transpose the six principles of nitrogen management presented in the Annex III, part 2 of Directive 2284/2016 which are also listed in the Annex IX of the Gothenburg Protocol into national legal framework		Transposed Directive 2284/2016	MEP Annual Progress monitoring report	No	[2024]
A(H)	Prepare a National Advisory Code of Good Agricultural Practices to control NH3 emissions, by complementing and extending the existing national Code of Good Agricultural Practices of 2016 to better consider measures to reduce NH3 emissions in line with the UN ECE and EU requirements		Adopted national Code of Good Agricultural Practices to control NH3 emissions	MEP Annual Progress monitoring report		Yes [2023]
A(H)	Establish a national nitrogen budget to monitor the changes in overall losses of reactive nitrogen from agriculture, including NH3, NOx, ammonia, nitrous oxide, ammonium, nitrates and nitrites, based on the principles set out in the UNECE Guidance Document on Nitrogen Budgets [77]		National Nitrogen budget set up	Ministry of Agriculture, Forestry and Water Management	No	Yes
(H)	Reinforce human resources of the Ministry of Agriculture, Forestry and Water Management (MAFWM) - 3 FTE are needed to develop the National advisory Code, organise agricultural extension services and disseminate the good practices in an integrated approach) and of Agricultural advisory services (10 FTE for dissemination of ammonia reduction measures and protection of underground water bodies)		Number of additional Administrative Capacities at MAFWM and at Agricultural advisory services	Ministry of Agriculture, Forestry and Water Management, Agricultural Advisory Services	0	3 and 10 at [2023]

[77] UN ECE Executive Body Decision 2012/10/EC, ECE/EB.AIR/113/Add 1.

No.	Name of measure/activity	Regulation /PPP that need to be adopted/amended to implement the measures	Performance indicator	Source of data	Base value [2015]	Target value [year]
(H)	Inform and disseminate the National Advisory Code of Good Agricultural Practices and develop awareness raising campaigns regarding the impact of NH_3 on air quality and measures to reduce them (through multiple events (5 in Serbia per year from 2024), communication materials ((flyers, videos…): 10) , web site (1))		Implemented program of events: 5 events per year from 2024 to 2030 and prepared, promotional materials (flyers, videos, etc.): 10 made from 2024 to 2030), 1 website in 2024	Capacity building and dissemination of good practices	No	Yes from 2024 to 2030
	Implement best practices for slurry storage		Share of covered slurry storage (in %)	Ministry of Agriculture, Forestry and Water Management, Agricultural Extension services	0.3%	1.9% in 2030
(H)	Enhance technical capacity of farmers on best practices at spreading and other best practices (demonstration farm (1), special training for farmers (15 per year from 2024), development of specific guidance's)		In 2024 established demonstration farm for dissemination of good manure spreading practices and other best practices, percentage of informed and trained	Demonstration farm yearly report	-No	Yes

No.	Name of measure/activity	Regulation /PPP that need to be adopted/amended to implement the measures	Performance indicator	Source of data	Base value [2015]	Target value [year]
			farmers (more than 80%) and completed Training Program for Farmers according to the annual plan for the period from 2024 to 2030 (15 trainings per year)			
(H)	Ensure the finalization of the issuance of integrated permits for IPPC farms based on the use of BAT.		Integrated permits updated with relevant values of best available techniques relevant to farms required to obtain an integrated permit	IPCC permit statistics	-No	Yes [2025]
	Conduct a survey every year on the use of best practices in farms		Conducted Annual survey on the use of best practices in farms (to be combined with practices to reduce GHG emissions)	Agricultural advisory service	No	Yes [2025]
No.13 (WAM B8)	**Substitution of urea with ammonium nitrate fertilizer**	Phasing out of nitrate fertilizers	Share of urea and ammonium nitrate in the total mineral nitrogen spread	Annual survey of best practices by	Share of urea in the total mineral nitrogen spread: 29,2% Share of ammonium nitrate in the total mineral nitrogen spread: 50,2% [2022]	Share of urea in the total mineral nitrogen spread: 21,6% Share of ammonium nitrate in the total mineral nitrogen spread: 57,8% [2030]

No.	Name of measure/activity	Regulation /PPP that need to be adopted/amended to implement the measures	Performance indicator	Source of data	Base value [2015]	Target value [year]
	See horizontal activities marked with (H) under the Measure No.12	IE(No.12)	IE(No.12)	IE(No.12)	IE(No.12)	IE(No.12)
	Implementation of substitution of urea with ammonium nitrate fertilizers		Percentage share of urea and ammonium nitrate in the total mineral nitrogen spread	Annual survey of best practices by	Share of urea in the total mineral nitrogen spread: 29,2% Share of ammonium nitrate in the total mineral nitrogen spread: 50,2% [2022]	Share of urea in the total mineral nitrogen spread: 21,6% Share of ammonium nitrate in the total mineral nitrogen spread: 57,8% [2030]
No.14 (WAM A11)	**Introduction of the best practices at spreading for solid manure application by faster incorporation of manure in the soil**	Reduction of NH_3 emissions through best practices of manure application by faster incorporation of manure in the soil spreading	Share of solid manure per animal type (pig, poultry, cattle) incorporated respectively within 4 hours, 12 hours and 24 hours.	Survey on all Serbian farms every two years from 2024	-	Increase in Pig and poultry farms: rapid incorporation within 4 hours and 12 hours Cattle manure: rapid incorporation within 24 hours, 12 hours or 4 hours [2030]
	See horizontal activities marked with (H) under the Measure No.12	IE(No.12)	IE(No.12)	IE(No.12)	IE(No.12)	IE(No.12)
	Implement the solid manure application by faster incorporation of manure in the soil		Percentage share of solid manure per animal type (pig, poultry, cattle) incorporated respectively within 4 hours, 12 hours and 24 hours.	Survey on all Serbian farms every two years from 2024	The following percentages are expressed as % of total solid manure per livestock category (includes also the animals raised in IED farms) : - Pig manure - Incorporation within 12 hours : 1,6%	The following percentages are expressed as % of total solid manure per livestock category (includes also the animals raised in IED farms) : - Pig manure - Incorporation within 12

No.	Name of measure/activity	Regulation /PPP that need to be adopted/amended to implement the measures	Performance indicator	Source of data	Base value [2015]	Target value [year]
					- Pig manure - Incorporation within 4 hours : 7,7% - Poultry manure Incorporation within 12 hours : 5,7% -Poultry manure Incorporation within 4 hours : 7,7% - Cattle manure - Incorporation within 24 hours : 7,7% - Cattle manure - Incorporation within 12 hours : 7% -Cattle manure - Incorporation within 4 hours : 0,7%	hours : 6,2% - Pig manure - Incorporation within 4 hours : 18,3% - Poultry manure - Incorporation within 12 hours : 21,5% - Poultry manure - Incorporation within 4 hours : 18,3% - Cattle manure - Incorporation within 24 hours : 18,3% - Cattle manure - Incorporation within 12 hours : 15% - Cattle manure - Incorporation within 4 hours : 3,3%
No.15 (WAM B7)	**Introduction of best practices at spreading for pig and cattle slurry :**	Reduction of NH_3 emissions through best practices at spreading for pig and cattle slurry	Share of slurry per animal type (pig, cattle) spread by injection and trailing hose followed by an incorporation within 4 hours or 12 hours.	Survey on all Serbian farms every two years from 2024	0-	Reduction of 2kt of NH_3 by 2030 by increase in injection and trailing hose & incorporation [2030]
	See horizontal activities marked with (H) under the Measure No.12	IE(No.12)	IE(No.12)	IE(No.12)	IE(No.12)	IE(No.12)
	Implementation of best practices at spreading for pig and cattle slurry through upgrade of agriculture machinery (injection and trailing hose)		Percentage share of slurry per animal type (pig, cattle)	Annual survey on all	The following percentages are expressed as % of total	The following percentages are expressed as % of total

No.	Name of measure/activity	Regulation /PPP that need to be adopted/amended to implement the measures	Performance indicator	Source of data	Base value [2015]	Target value [year]
			spread by injection and trailing hose followed by an incorporation within 4 hours or 12 hours.	Serbian farms to be implemented	slurry per livestock category (includes also the animals raised in IED farms) : - Pig manure - Injection : 9,7% - Pig manure - Trailing hose & incorporation within 4 hours :2,1% - Pig manure - Trailing hose & incorporation within 12 hours :0,7% - Cattle manure - Injection: 7% - Cattle manure - Trailing hose & incorporation within 4 hours: 6,3% - Cattle manure - Trailing hose & incorporation within 12 hours: 6,3%	slurry per livestock category (includes also the animals raised in IED farms): - Pig manure - Injection: 28,3% - Pig manure - Trailing hose & incorporation within 4 hours: 9,6% - Pig manure - Trailing hose & incorporation within 12 hours: 3,5% - Cattle manure - Injection: 15% - Cattle manure - Trailing hose & incorporation within 4 hours: 11,7% - Cattle manure - Trailing hose & incorporation within 12 hours: 11,7%
No16 (WAM C3)	**Limitation of the burning of agricultural residues (0% in 2030)**	Implementation of banning of burning of agriculture residues	Share of total burnt maize and wheat residues	Annual survey on all Serbian farms to be implemented	Share of maize residue burned : 17,0% Share of wheat residues burned : 9,1%	Share of maize residue burned : 0% Share of wheat residues burned : 0% [2030]

No.	Name of measure/activity	Regulation /PPP that need to be adopted/amended to implement the measures	Performance indicator	Source of data	Base value [2015]	Target value [year]
[A]	Inform and disseminate the Code for good practices for agricultural residues and develop awareness raising campaigns regarding the agricultural waste burning on air quality and measures to avoid this burning (through multiple events (1 in Serbia per year from 2023), communication materials ((flyers, videos, etc.): 5) , web site (1)).		Implemented program of events: 1 event per year from 2023 to 2030 Promotional materials (flyers, videos, etc.): 5 made from 2024 to 2030 1 website 2024.	A yearly programme of events status of the dedicated web site	-No	Yes
	Limitation of the open burning of agricultural residues through investment in agriculture machinery in order to incorporate crop residues.		The amount of financial resources needed to upgrade agricultural machinery	IPARD programme statistics	0 Mio€	46,23 Mio€
	Enhance technical capacity of farmers on best practices at harvesting and other best practices (special training for farmers (2 per year from 2024),		Percentage of informed and trained farmers (more than 80%) and completed Training Program for Farmers according to the annual plan for the period from 2024 to 2030 (2 trainings per year)	A programme of training for farmers	No	Yes
Specific objective 4: **Promote transition to clean air for everyone**						
No.17	**Education on air quality, training for implementation of best practices and awareness raising**	Awareness rising on the negative effects of air pollution	Prepared recommendation on health impacts, informed 80% of households and	MEP	**-**	Yes [2025]

No.	Name of measure/activity	Regulation /PPP that need to be adopted/amended to implement the measures	Performance indicator	Source of data	Base value [2015]	Target value [year]
			expanded knowledge on the proper use of devices that use solid fuel as an energy source)			
	Education: implementation of environmental and air quality projects and the role of children in their preservation		Implemented activity	MEP	No	Yes [2025]
	Capacity building, awareness raising campaigns and support given to the households about the proper use of small appliances using solid fuels and conducting the assessment of the moisture content of the wooden biomass.		Percentage of households informed about the proper use of firewood in small heating appliances	Ministry of Mining and Energy	0%	Yes [2025]
	Establishing of the mobile demonstration centre (or equivalent) for knowledge sharing regarding the proper use of biomass in small appliances and boilers		An active campaign started to launch a mobile demo center in Belgrade, Nis, Kragujevac, Valjevo, Uzice and the zone of Serbia	Ministry of Mining and Energy	No	Yes [2026]

9 ACTION PLAN

The Action Plan envisages specific measures and activities that will be taken to ensure the conditions for the realisation of the objectives of the Programme, determines the bodies that implement activities and partner bodies in the implementation of activities, as well as the time required to implement these activities.

10 FINAL PART

This Programme shall be published on the Government's website, on the e-Government portal and on the website of the Ministry of Environmental Protection, within seven working days from the day of its adoption.

This Programme shall be published in the "Official Gazette of the Republic of Serbia".

05 Number: 353-9878/2022-1

In Belgrade, December 8, 2022

THE GOVERNMENT

Ana Brnabić

Table 9-1: **Action plan (standardised form)**

Action plan:	**Action plan for implementation of Programme of Air Protection of the Republic of Serbia for the period 2022-2030**
Proposer:	MEP
Coordination and reporting:	MEP

General goal 1: ***To reduce up to 2030 the health damage due to poor air quality by half compared to 2015 by reducing exposure to air pollution while aligning Serbia with the European Union's regulatory limits to air pollution and limiting the damage on ecosystems***						
Institution responsible for monitoring and controlling of implementation: MEP						
Indicator(s) at general objective level (*effect indicator*)	Unit of measure	Source of verification	Initial value in 2015	Base year value in 2022	Target value in last year of AP	Last year of AP validity
Share of air quality measuring points in which daily limit value of 50 µg/m3 for PM10 (%) was exceeded more than 35 times in one calendar year	%	Annual report on Air Quality in Serbia (SEPA)	83	28	15	2026.
Share of air quality measuring points in which yearly limit value for PM_{10} (%) was exceeded	%	Ambient Air Quality in Europe (EEA)	75	43	20	2026.
Number of days when threshold value of SO2 was exceeded in Bor for the calculation in one day	Number	Annual Air Quality Report in Serbia (SEPA)	139	58	<3	2026
Average annual concentration of arsenic in Bor	ng/m^3	Annual Air Quality Report in Serbia (SEPA)	No data	117	6	2026

Average annual concentration of cadmium in Bor	ng/m^3	Annual Air Quality Report in Serbia (SEPA)	No data	22	5	2026
Average annual emission levels (AELs) of $PM_{2.5}$	$\mu g.m^{-3}$	Annual Air Quality Report in Serbia (SEPA)	No data	32.0	<20	2026
Premature death due to exposure to $PM_{2.5}$	Number	Annual Air Quality Report in Serbia (SEPA)	9773	12760	9080	2026

Specific goal 1.1: ***Reduce emissions of SO_2 by 92% and fine particles $PM_{2.5}$ by 58.3% from Energy sector (including traffic and individual combustion) in 2030 compared to 2015***								
Institution responsible for monitoring and controlling of implementation: MEP								
Indicator(s) at specific objective level (*outcome indicator*)	Unit of measure	Source of verification	Initial value in 2015	Base year 2022	Target value in 2023	Target value in 2024	Target value in 2025	Target value in the last year of AP 2026
Total emissions of SO_2 from energy sector (Codes A to D and F to I)	$ktSO_2$	National CRLTAP Inventory report - SEPA	365,5	365,7	255,2	141,7	34,3	33,3
Total emissions of $PM_{2.5}$ from energy sector (Codes A to D and F to I)	$ktPM_{2.5}$	National CRLTAP Inventory report - SEPA	46,9	47,9	44,7	41,6	38,7	35,0

Measure 1.1.1: **Implementation of Chapter II of the EU Emissions Directive for Large Combustion Plants, taking into account upper and lower average emission levels in relation to best available techniques**								
Institution responsible for the implementation: MEP								
Period of implementation: 2022-2026#	Type of measure: Regulatory							
Regulations to be amended / adopted for the implementation of the measure:	Law on Integrated Prevention and Control of Environmental Pollution and bylaws							
Indicator(s) at the level of the measure (result indicator)	Unit of measure	Source of verification	Initial value in 2015	Target value in 2022	Target value in 2023	Target value in 2024	Target value in 2025	Target value in 2026
Integrated permits issued / amended, taking into account BAT AELs and air quality in zones and agglomerations, in order to implement Chapter II of the EU Directive on Industrial Emissions for Large Combustion Plants.	Yes/No	Issued / amended permits (MEP, AP Vojvodina, LSU)	No	No	No	No	Yes	Yes

Source of financing of measures	Link to programme budget	Total estimated financial resources in 000 RSD[78]				
		In year 2022	In year 2023	In year 2024	In year 2025	In year 2026
Budget revenues	0404-560-0002-411		IE[79]	IE	IE	IE
EU financial assistance/donors	Donor funds	-		11.750*	11.750*	11.750*

Title of activity:	Authority implementing the activity	Partner authorities in the implementation of activities	Deadline for completion of activities	Source of financing[80]	Link to program budget 81	Total estimated financial resources by sources in 000 RSD[82]				
						In year 2022	In year 2023	In year 2024	In year 2025	In year 2026
1.1.1.1 Ensure the full alignment of the national legislation with the IED for LCP covered in its annex I - Amendments to the bylaws	MEP	Provincial Secretariat in charge of Environmental Protection and local self-government units competent for issuance of the integrated permits SEPA	Q4 2023	Budget/regular allocations	*(Code for salaries)*					
1.1.1.2 Ensure that the increase of human	MEP	Provincial Secretariat in	Q4 2025	Budget (IE)	0404-560-		IE	IE	IE	IE

[78] Financial resources are assessed at the level of the measure, it is not necessary to assess them at the level of activities.

[79] Additional administrative costs already included in DSIP for Industrial Emission Directive

[80] List one of the sources of funding: budget funds, loans, donor funds, IPA, etc. In the case of donor funds, it is mandatory to indicate the specific donor.

[81] Code of the program and program activity or project within which the funds are provided

[82] An asterisk indicates funds that are not fully securedQ4

Title of activity:	Authority implementing the activity	Partner authorities in the implementation of activities	Deadline for completion of activities	Source of financing[80]	Link to program budget 81	Total estimated financial resources by sources in 000 RSD[82]				
						In year 2022	In year 2023	In year 2024	In year 2025	In year 2026
resources of Serbian institutions in order to deal with issuing IPPC permits, in line with identified needs, has been done as this was established in the DSIP for the IED (Project IED Serbia)		charge of Environmental Protection		Budget of AP Vojvodina	0002-411					
1.1.1.3 Ensure that all large combustion plants operate in accordance with updated integrated permits.	MEP		Q4 2025	Investors	-	-	-	-	-	-
1.1.1.4 Make sure that all the facilities from the scope of the IED report National Register of Pollution Sources	SEPA	MEP	Q4 2026	Donor funds	-	-		11.750	11.750	11.750

Measure 1.1.2: **Enforcement of the EU Directive 2015/2193 on the limitation of emissions of certain pollutants into the air from medium combustion plants**	
Institution responsible for the implementation: MEP	
Implementation period: 2022-2026#	Type of measure: Regulatory
Regulations that need to be amended/adopted to implement the measure:	Adopt a Regulation on emission limit values of pollutants in the air from medium combustion plants. This regulation will need to merge the requirements of the MCPD and of the regulation on emission limit values of pollutants in the air from combustion plants and the Regulation on Emission Measurements ("Official Gazette of the Republic of Serbia", No. 5/16).

Indicator(s) at the level of the measure (result indicator)	Unit of measure	Source of verification	Initial value in 2015	Target value in 2022	Target value in 2023	Target value in 2024	Target value in 2025	Target value in 2026
Share of medium combustion plants compliant with EU Directive 2015/2193 on the limitation of emissions of certain pollutants into the air from medium combustion plants	%	SEPA MCE registry	0	0	-	30	60	70

Source of financing of measures	Link to programme budget	Total estimated financial resources in 000 RSD				
		In year 2022	In year 2023	In year 2024	In year 2025	In year 2026
Budget revenues	0404-560-0002-411		2350*	2350*	2350*	2350*
Budget revenues	0404-560-0007-411		2350*	2350*	2350*	2350*
Financial assistance EU/donors	Donor funds		47.000*	47.000*		

Title of activity:	Authority implementing the activity	Partner authorities in the implementation of activities	Deadline for completion of activities	Source of financing	Link to programme budget	Total estimated financial resources by sources in 000 RSD				
						In year 2022	In year 2023	In year 2024	In year 2025	In year 2026
1.1.2.1 Finalise the full alignment of the national legislation with the MCPD	MEP	Provincial Secretariat in charge of Environmental Protection and local self-government units competent for the issuance of integrated permits, SEPA	Q4 2024	Budget/regular allocations	PR/PA	-	-	-	-	-
1.1.2.2. In order to ensure the implementation of the requirements of the Medium Combustion Plants Directive, the following provisions should be made - continuation of the analysis of currently available data on medium combustion plants; - supplementing the database so that it contains the total number of medium combustion plants; - establish a reporting system and database (Article 11)[83]	SEPA	MEP	Q4 2023	Donor funds	-	-	47.000	47.000	-	-

[83] Within the ENVAP 2 project (funded by the Swedish International Development Cooperation Agency (SIDA) and implemented by the Swedish Environmental Protection Agency in the period 2016-2021) which provided support to Serbia and the Ministry of Environmental Protection in preparing for negotiations and harmonization of requirements Chapter 27 Environment, in 2016, a preliminary assessment of the current state of medium combustion plants in the Republic of Serbia was performed.

Title of activity:	Authority implementing the activity	Partner authorities in the implementation of activities	Deadline for completion of activities	Source of financing	Link to programme budget	Total estimated financial resources by sources in 000 RSD				
						In year 2022	In year 2023	In year 2024	In year 2025	In year 2026
1.1.2.3. Compliance of medium combustion plans with limit values	MEP	SEPA	2025-Q4 2026	Investors	-	-	-	-	-	-
1.1.2.4. Ensure an increase in the number of employees in the institutions of the Republic of Serbia who would work on jobs related to medium combustion plants (but also others, such as small combustion plants and domestic heating appliances): MEP: 2 positions for experts in medium combustion plants (but also small combustion plants and domestic heating appliances);	MEP	-	Q4 2023	Budget	0404-560-0002-411		2.350	4.700	4.700	4.700
	AP Vojvodina (Provincial Secretariat for Urban Planning and Environmental Protection)		Q4 2025	Budget					2.350	2.350
AP Vojvodina (Provincial Secretariat for Urban Planning and Environmental Protection): 1 position for an expert for medium combustion plants (but also small combustion plants and home heating appliances). SEPA: 1 officer for medium combustion plants (but also small combustion plants and home heaters).	SEPA		Q4 2025	Budget	0404-560-0007-411				2.350	2.350

Measure 1.1.3: **Implementation of the Regulation on emission limit values for polluting matters into the air from combustion plants in the part related to small plants with small combustion plants (capacity up to 1 MW), and which are not subject to the Eco-design Directive**	
Institution responsible for the implementation: MEP	
Implementation period:2022-2026#	Type of measure: Regulatory
Regulations that need to be amended/adopted to implement the measure:	Regulation on emission limit values of pollutants in the air from medium combustion plants.

Indicator(s) at the level of the measure (result indicator)	Unit of measure	Source of verification	Initial value in 2015	Target value in 2022	Target value in 2023	Target value in 2024	Target value in 2025	Target value in 2026
Share of small combustion plants not subject to the Ecodesign Directive in accordance with the lower emission limit values from the Regulation on emission limit values for polluting matters into the air from combustion plants in the part related to small combustion plants (capacity to 1 MW)	Share of SCP installations not subject to ECO design Directive	Annual monitoring of emissions from small combustion plants performed by authorised legal entities	0	-	-	30	60	70

Source of financing of measures	Link to programme budget	Total estimated financial resources in 000 RSD				
		In year 2022	In year 2023	In year 2024	In year 2025	In year 2026
Budget of the RS						
EU financial assistance	Donor funds / Taiex		17.500*			

Title of activity:	Authority implementing the activity	Partner authorities in the implementation of activities	Deadline for completion of activities	Source of financing	Link to programme budget	Total estimated financial resources by sources in 000 RSD				
						In year 2022	In year 2023	In year 2024	In year 2025	In year 2026
1.1.3.1. Update emission limit values for small combustion installations with a capacity of less than 1 MW (boilers or stationary engines)	MEP	SEPA	Q4 2023	Donor funds / Taiex			17.500*			
1.1.3.2. Ensuring compliance with stricter emission limit values for small combustion plants not subject to the Ecodesign Directive.	MEP		2025 – Q4 2026	Investors		-	-	-	-	-

Measure 1.1.4: **Enforcement of minimum Euro standards for second-hand vehicles imported: Euro 5/V from 1st January 2024 and Euro 6/VI from 1st January 2025**	
Institution responsible for the implementation: The Ministry of Internal and Foreign Trade	
Implementation period:2022-2026	Type of measure: Regulatory
Regulations that need to be amended/adopted to implement the measure:	Regulation on import of motor vehicles Goods

Indicator(s) at the level of the measure (result indicator)	Unit of measure	Source of verification	Initial value in 2015	Target value in 2022	Target value in 2023	Target value in 2024	Target value in 2025	Target value in 2026
Enforced minimum Euro standards for second-hand vehicles imported: Euro 5/V from 1st January 2024	Yes/No	Annual Progress monitoring report	No	-	-	Yes	Yes	Yes
Enforced minimum Euro standards for second-hand vehicles imported: Euro 6/VI from 1st January 2025	Yes/No	Annual Progress monitoring report	No	-	-	-	Yes	Yes

Source of financing of measures	Link to programme budget	Total estimated financial resources in 000 RSD				
		In year 2022	In year 2023	In year 2024	In year 2025	In year 2026
Budget RS EU financial assistance	Donor funds /Taiex	1.175*				

Title of activity:	Authority implementing the activity	Partner authorities in the implementation of activities	Deadline for completion of activities	Source of financing	Link to programme budget	Total estimated financial resources by sources in 000 RSD				
						In year 2022	In year 2023	In year 2024	In year 2025	In year 2026
1.1.4.1 Amend the Regulation on the import of motor vehicle standards for imported passenger cars, duty vehicles and busses. The minimum standards are Euro 5/V from 1st January 2024 and Euro 6/VI from 1st January 2025	Ministry of Internal and Foreign Trade	MEP MCTI Agency for Traffic Safety	Q4 2023	Donor funds /Taiex			1.175			
1.1.4.2. Compliance with updated minimum requirements for passenger cars, duty vehicles and buses	Ministry of Internal and Foreign Trade	Agency for Traffic Safety, Ministry of Finance	2023 – Q4 2025	Investors and consumers		-	-	-	-	-

Measure 1.1.5: **Additional vehicle fleet renewal due to financial incentives for scrapping oldest Euro 1, 2 and 3 diesel passenger cars and duty vehicles (except N3) and for EURO I, II and III diesel busses**	
Institution responsible for the implementation: Ministry of Finance	
Implementation period:2024-2026#	Type of measure: Incentive measure
Regulations that need to be amended/adopted to implement the measure:	Regulation on financial incentives for scrapping oldest Euro 1, 2 and 3 diesel passenger cars and duty vehicles (except N3) and for EURO I, II and III diesel busses

Indicator(s) at the level of the measure (result indicator)	Unit of measure	Source of verification	Initial value in 2015	Targeg value in 2022	Target value in 2023	Target value in 2024	Target value in 2025	Target value in 2026
Registered vehicles sent for deregistration to recycling centres through the incentive scheme	No. of vehicles scrapped	Recyclers association of Serbia and Ministry of Finance	0	-	-	77.200	45.100	17.900

Source of financing of measures	Link to programme budget	Total estimated financial resources in 000 RSD				
		In year 2022	In year 2023	In year 2024	In year 2025	In year 2026
Budget revenues	[…]	-	-	-	-	-
Budget RS	[…]	-	-	-	17.115.000*	1.480.500*
Financial assistance of the EU	[…]	-	14.688* 117.500*	14.688*	14.688*	14.688*

Title of activity:	Authority implementing the activity	Partner authorities in the implementation of activities	Deadline for completion of activities	Source of financing	Link to programme budget	Total estimated financial resources by sources in 000 RSD				
						In year 2022	In year 2023	In year 2024	In year 2025	In year 2026
1.1.5.1 Prepare and adopt an end-of life vehicle management plan and enhance the vehicles recycling centers (in line with waste management strategy)	MEP	Recyclers Association of Serbia	Q4 2023	Donor funds			117.500	-	-	-
1.1.5.2.[84] Set up and implement support mechanism from public funds for scrapping of old diesel engine passenger cars, duty vehicles (except N3) and buses (respectively Euro 1, Euro 2, Euro 3 and Euro I, Euro II and Euro III) into recycling centers.	Agency for traffic safety	MEP MCTI	Q4 2026	Donor funds	-		14.688	14.688	14.688	14.688

[84] Establishing the mandate of the Agency for Traffic Safety.

1.1.5.2[85] Set up and implement the public financial support mechanism for the scrapping of old diesel passenger cars, duty vehicles (except N3) and busses (respectively Euro 1, Euro 2, Euro 3 and Euro I, Euro II and Euro III) into recycling centers.	MCTI	MEP, Agency for traffic safety	Q4 2026	Budget	[…]				17.155.000	1.480.500
1.1.5.3. Amendments to the Law on taxes on the use, possession and carrying of goods in the part regarding the motor vehicles tax.[86]	Ministry of finance	MCTI Ministry of Interior	2024-Q4 2026	Budget (revenues)	-					

[85] Implementation within the scope of the MCTI.

[86] Legal framework should be amended by the end of 2024, and the implementation should start by January 1, 2028 at the latest.

Measure 1.1.6: **Enforcement of regulation (EU) 2016/1628 on requirements relating to gaseous and particulate pollutant emission limits and type-approval for internal combustion engines for non-road mobile machinery**	
Institution responsible for the implementation: MCTi	
Implementation period: 2022-2026#	Type of measure: Regulatory
Regulations that need to be amended/adopted to implement the measure:	Rulebook on emission limit values of gaseous and particulate pollutants and homologation of internal combustion engines for off-road mobile machinery

Indicator(s) at the level of the measure (result indicator)	Unit of measure	Source of verification	Initial value in 2015	Target value in 2022	Target value in 2023	Target value in 2024	Target value in 2025	Target value in 2026
Share of vehicles in accordance with regulations on heavy non-road machinery - Enforcement of Regulation (EU) 2016/1628 on requirements relating to gaseous and particulate pollutant emission limits and type-approval for internal combustion engines for non-road mobile machinery, amending Regulations (EU) No 1024/2012 and (EU) No167/2013, and amending and repealing Directive 97/68/EC	%	SEPA database COPERT (for registered tractors) IPARD monitoring plan	0	0	0	0	7	13

Source of financing of measures	Link to programme budget	Total estimated financial resources in 000 RSD				
		In year 2022	In year 2023	In year 2024	In year 2025	In year 2026
Budget RS	0701-450-0001-411				7.050*	7.050*
Financial assistance of the EU	Donor funds		35.300*			

Title of activity:	Authority implementing the activity	Partner authorities in the implementation of activities	Deadline for completion of activities	Source of financing	Link to programme budget	Total estimated financial resources by sources in 000 RSD[87]				
						In year 2022	In year 2023	In year 2024	In year 2025	In year 2026
1.1.6.1 Finalised the work programme for full alignment of the national legislation with the regulation 2016/1628 through the Rulebook on emission limit values of gaseous and particulate pollutants and homologation of internal combustion engines for off-road mobile machinery).	MCTI	Road Traffic Safety Agency (RTSA),	Q4 2024	Donor funds	-		35.300	-	-	-
1.1.6.2. Ensure an increase of human resources of Serbian institutions in order to deal with the NRMM (but also road traffic and other traffic modes): MCTI: 1 working place with specialization in NRMM (but also road traffic and other traffic modes) RTSA: 1 officer to deal with NRMM (but also road traffic and other traffic modes), 1 officer to deal with road traffic and other modes of transport	MCTI	Road Traffic Safety Agency (RTSA),	Q4 2025	Budget	0701-450-0001-411				7.050	7.050
1.1.6.3. Implementation of emission limit values for gaseous and suspended particles and homologation of internal combustion engines for heavy non-road machinery.	MCTI	RTSA	Q4 2025	Investors		-	-	-	-	-

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Measure 1.1.7: **Faster replacement of existing domestic heating appliances with new appliances Eco-Design compliant with financial incentives and larger share of replacement in the cities of Kragujevac, Beograd, Nis, Valjevo and Užice**								
Institution responsible for the implementation: Ministry of Mining and Energy								
Implementation period: 2022-2026#			Type of the measure: Regulatory, Incentive					
Regulations that need to be amended/adopted to implement the measure:			Regulation on eco-design requirements for solid fuel boilers Regulation on eco-design requirements for solid fuel local space heaters					
Indicator(s) at the level of the measure (result indicator)	Unit of measurement	Source of verification	Initial value in 2015	Target value in 2022	Target Value in 2023	Target Value in 2024	Target Value in 2025	Target value in the last year of AP, 2026
Amount of financial incentive for faster replacement of existing domestic heating appliances with new appliances Eco-Design compliant and heat pumps with larger share of replacement in the cities of Kragujevac, Beograd, Nis, Valjevo and Užice	EUR	Ministry of Mining and Energy through statistics on incentives	0	0	0	EUR 9.20 million of financial incentives were awarded, of which EUR 0.2 million to Kragujevac, EUR 1.46 million to Belgrade, EUR 0.74 million to Nis, EUR 0.25 million to Valjevo, EUR 0.33 million to Uzice, and EUR 6 to	EUR 20.5 million of financial incentives were awarded, of which EUR 0.6 million to Kragujevac, EUR 4.35 million to Belgrade, EUR 2.95 million to Nis, EUR 1.61 million to Valjevo, EUR 1.81 million to Uzice, and EUR 9.2 million to the	EUR 48.90 million of financial incentives were awarded, of which EUR 0.99 million to Kragujevac, EUR 7.1 million to Belgrade, EUR 4.64 million to Nis, EUR 2.53 million to Valjevo, EUR 2.44 million to Uzice, and EUR 30.3 million to the zone of the Republic of Serbia

						Zone of the Republic of Serbia. 2 million euros	zone of the Republic of Serbia	

Source of financing of measures	Link to programme budget	Total estimated financial resources in 000 RSD				
		2022	2023	2024	2025	2026
Budget RS	0501-430-0001-411			14.100*	14.100*	14.100*
Other sources of financing				1.080.729*	2.412.941*	5.641.307*-

Title of activity:	Authority implementing the activity	Partner authorities in the implementation of activities	Deadline for completion of activities	Source of financing	Link to programme budget	Total estimated financial resources by sources in 000 RSD				
						2022	2023	2024	2025	2026
1.1.7.1 Complete the work on full harmonisation of national legislation with the Ecodesign Directive and work on the transposition of the following two regulations: Regulation 2015/1189 of 28	Ministry of Mining and Energy	MEP Cities of Kragujevac, Beograd, Nis, Valjevo and Užice Conformity Assessment Bodies	Q4 2023							

Title of activity:	Authority implementing the activity	Partner authorities in the implementation of activities	Deadline for completion of activities	Source of financing	Link to programme budget	Total estimated financial resources by sources in 000 RSD				
						2022	2023	2024	2025	2026
April 2015 implementing Directive 2009/125/EC and Regulation 2015/1185 of 24 April 2015 implementing Directive 2009/125/EC										
1.1.7.2 Establishment and implementation of a mechanism for financial incentives for the replacement of existing heating radiators in households with new appliances Eco-Design compliant and heat pumps labelled with	Ministry of Mining and Energy	Local Self Government units	Q4 2026	Other sources of financing				1,080,729	2,412,941	5,641,307

Title of activity:	Authority implementing the activity	Partner authorities in the implementation of activities	Deadline for completion of activities	Source of financing	Link to programme budget	Total estimated financial resources by sources in 000 RSD				
						2022	2023	2024	2025	2026
adequate energy label.#										
1.1.7.3 Providing a mechanism of financial incentives by employing an additional 15 full-time employees in order to inform the public on how to reduce emissions from domestic heaters and provide access to financial support.	Ministry of Mining and Energy Energy Efficiency Administration		Q4 2024	Budget	0501-430-0001-411 + 412			14.100	14.100	14.100

Measure 1.1.8: **Enforcement of the amended fuel quality Directive 2009/30/EC and Directive 2016/802/EC on the reduction of the sulphur content of certain liquid fuels**	
Institution responsible for the implementation: Ministry of Mining and Energy	
Implementation Period: 2022-2025	Type of the measure: Regulatory
Regulations that need to be amended/adopted to implement the measure:	Amendments and supplements to the Rulebook on technical and other requirements for fuels of petroleum origin

	Drafting of the Rulebook on technical and other requirements for marine fuels Amendments and supplements to the regulations from the field of waterways transport

Indicator(s) at the level of the measure (result indicator)	Unit of measurement	Source of verification	Initial value in 2015	Target value in 2022	Target Value in 2023	Target Value in 2024	Target Value in 2025	Target value in the last year of AP, 2026
Share of liquid fuels with ultra-low sulfur content placed on the market of the Republic of Serbia in accordance with the requirements of the Directive.	%	Annual Monitoring Progress Report	0	0	0	0	100	100

Source of financing of measures	Link to programme budget	Total estimated financial resources in 000 RSD				
		2022	2023	2024	2025	2026
Budget RS	0701-450-0001-411		IE	IE	IE	IE
EU financial assistance			7.833	7.833	7.833	

Title of activity:	Authority implementing the activity	Partner authorities in the implementation of activities	Deadline for completion of activities	Source of financing	Link to programme budget	Total estimated financial resources by sources in 000 RSD				
						2022	2023	2024	2025	2026
1.1.8.1 Complete the work programme for full harmonisation of national legislation with the Fuel Quality	Ministry of Mining and Energy	MCTI (Department for waterways transport and	Q4 2025	Donor funds	-		7.833	7.833	7.833	-

Directive 2009/30/EC and Directive 2016/802/EU on the reduction of sulphur in certain liquid fuels[88].		navigation safety) Ministry of Finance MEP Ministry of Internal and Foreign Trade								
1.1.8.2 Investments required to ensure compliance with the Fuel Quality Directive and the Directive on the reduction of sulphur in certain liquid fuels.	Ministry of Mining and Energy		Q4 2025	Investors		-	-	-	-	-
1.1.8.3 Increasing the number of employees in institutions: six persons to monitor the implementation of the above Directives	Ministry of Mining and Energy	MCTI (Department for waterways transport and navigation safety) Ministry of Finance	Q4 2025	Budget	0701-450-0003-411			IE[89]	IE	IE

[88] Within the EAS3 Project, two Specific Implementation Plans have been developed, as well as a list of laws, regulations and ordinances that need to be amended.

[89] Specific Implementation Plan for Directive 2016/802/EU of the European Parliament and of the Council of 11 May 2016 on the reduction of sulphur in certain liquid fuels and Specific Plan for Directive 98/70/EC of the European Parliament and of the Council of 13 October 1998 on the quality of petrol and diesel fuels and the amended Directive 93/12/EEC.

Measure 1.1.9: **Limiting VOC emissions by implementing the requirements of VOC Petrol Directives 94/63/EC (Stage I) and 2009/126/EC (Stage II) collecting petrol vapours from the storage and transport of petrol and refuelling motor vehicles at petrol stations**								
Institution responsible for the implementation: MEP								
Implementation Period: 2022-2026#			Type of the measure: Regulatory					
Regulations that need to be amended/adopted to implement the measure:			Amend the Rulebook on technical measures and requirements relating to the permissible emission factors for VOC, which come from the process of petrol storage and transport ("Official Gazette of the Republic of Serbia", No. 1/12, 25/12, 48/12 and 96/19); Amend and supplement the existing Rulebook on the methodology for establishment of national and local register of pollution sources and methodology for the types, methods and deadlines for data collection (National Register of Pollution Sources)					
Indicator(s) at the level of the measure (result indicator)	Unit of measurement	Source of verification	Initial value in 2015	Target value in 2022	Target Value in 2023	Target Value in 2024	Target Value in 2025	Target value in the last year of AP, 2026
Share of infrastructure in accordance with Directive 94/63/EC on the control of emissions of volatile organic compounds (VOCs) as a result of petrol storage and distribution from terminals to service stations (Phase I)	%	Monitoring Plan for the Implementation of the VOC Petrol Directive 90	0	40	60	70	80	100
Directive 2009/126/EC on the collection of petrol vapour when refuelling motor vehicles at petrol stations (Phase II)		Monitoring Plan for the Implementation of the	0	15	30	45	60	85

[90] A specific implementation plan for the VOC Petrol Directive has been developed within the EAS3 project.

		VOC Petrol Directive 91						

Source of financing of measures	Link to programme budget	Total estimated financial resources in 000 RSD				
		2022	2023	2024	2025	2026
Budget RS						
EU financial assistance	Donor funds		11.750*			

Title of activity:	Authority implementing the activity	Partner authorities in the implementation of activities	Deadline for completion of activities	Source of financing	Link to programme budget	Total estimated financial resources by sources in 000 RSD				
						2022	2023	2024	2025	2026
1.1.9.1 Completion of the legal transposition plan for VOC Petrol Directives 1994/63/EC and 2009/126/EC	MEP	Ministry of Mining and Energy SEPA	Q4 2023	Donor funds	-		11.750		-	-
1.1.9.2 Increasing the number of employees in SEPA and the MEP for the	MEP	SEPA	Q4 2023	Budget	0404-560-0002-411			IE[92]	IE	IE

[91] A specific implementation plan for the VOC Petrol Directive has been developed within the EAS3 project.

[92] Specific plan for the implementation of Directive 94/63/EC on the control of emissions of volatile organic compounds as a result of storage and distribution of petrol from terminals to service stations (Phase I) and Directive 2009/126/EC on the collection of petrol vapour when refuelling motor vehicles (Phase II).

implementation of the Directives.										
1.1.9.3 Implementation of steam collection systems in the supply, transport and distribution of petrol.#	MEP	Ministry of Mining and Energy	Q4 2026	Investors[93]						

Specific objective 1.2: ***Reduce emission of air pollutants and heavy metals from Industrial processes and product use through compliance with BAT AELs***								
Institution responsible for monitoring and control of implementation: MEP								
Indicator(s) at the level of the specific objective (result indicator)	Unit of measure ment	Source of verification	Initial value in 2015	Target value in 2022	Target Value in 2023	Target Value in 2024	Target Value in 2025	Target value in the last year of AP, 2026
Share of industrial plants in full compliance with the relevant emission levels related to best available techniques (BAT AELs), taking into account air quality in zones and agglomerations.	%	Reports on emission measureme nts in plants (SEPA)	15	15	15	20	60	100

[93] Costs of investors are already included in the DSIP for VOC.

Copper smelters in line with the lower BAT AELs for copper production of 50 mg/Nm3 for SO2	mgSO2/ Nm3	Ministry of Environmental Protection (data on integrated permits)	>50	-	-	-	50	50
Sulphuric acid production plants in accordance with the lower BAT AELs of100 mg/Nm^3 for SO_2	mgSO2/ Nm3	Ministry of Environmental Protection (data on integrated permits)	>100	-	-	-	100	100
Emissions of particulate matter from copper production in accordance with the Table of the Commission Implementing Decision 2016/1032/EU.	mg/Nm^3	Ministry of Environmental Protection (data on integrated permits)	>5	-	-	-	2-5	2-5

Measure 1.2.1: **Enforcement of the Chapter II of the EU Directive Industrial emissions for industrial processes with consideration of the mean of upper and lower levels of BAT AELs and the lower levels for copper production and sulphuric acid production in Bor**	
Institution responsible for the implementation: MEP	
Implementation Period: 2022-2026#	Type of the measure: Regulatory
Regulations that need to be amended/adopted to implement the measure:	See Measure 1.1.1

Indicator(s) at the level of the measure (result indicator)	Unit of measurement	Source of verification	Initial value in 2015	Target value in 2022	Target Value in 2023	Target Value in 2024	Target Value in 2025	Target value in the last year of AP, 2026
Concentration of SO2 emissions from specific industrial processes for copper production	mg/Nm^3	Annual report on continuous emission measurements	350	350	350	350	50	50
Concentration of SO2 emissions from specific industrial processes for production of sulphuric acid	mg/Nm^3	Annual report on continuous emission measurements	120	120	120	120	100	100
Concentration of particulate matter emission from specific industrial processes	mg/Nm^3	Annual report on continuous emission measurements	>5	-	-	2-5	2-5	2-5

Source of financing of measures	Link to programme budget	Total estimated financial resources in 000 RSD				
		2022	2023	2024	2025	2026
Budget RS EU financial assistance		IE	IE	IE	IE	IE [94]

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Title of activity:	Authority implementing the activity	Partner authorities in the implementation of activities	Deadline for completion of activities	Source of financing	Link to programme budget	Total estimated financial resources by sources in 000 RSD				
						2022	2023	2024	2025	2026
1.2.1.1 Ensure that all large industrial plants covered by Annex 1 of the Industrial Emissions Directive are issued integrated permits and comply with the relevant BAT AELs - amendments to the bylaws.[95]	MEP	Provincial Secretariat in charge of environmental protection and local self-government	Q4 2026	-	-	IE	IE[96]	IE	IE	IE
1.2.1.2 Ensure compliance of emissions from industrial processes with BAT AELs, taking into account air quality in zones and agglomerations, and additionally lower SO2 values for BAT AELs for copper production of 50 mg/Nm3 and 100 mg/Nm3 for	MEP	Industrial plant in Bor	Q4 2025				IE	IE	IE	IE

[95] Changes are required for emissions from industrial processes that lack BAT AELs or are not addressed in a simpler way.

[96] Costs included in Measure 1.1.1.

sulphuric acid production, and lower BAT AELs values for particulate matter from copper production according to Table 3 from Commission Implementing Decision 2016/1032/EU.[97]										

Measure 1.2.2: **Enforcement of the IED Chapter V, Annex VII for VOC or Chapter 2 for plants with solvents consumption larger than 200 t per year or 150 kg per hour**								
Institution responsible for the implementation: MEP								
Implementation Period: 2022-2026#			Type of the measure: Regulatory					
Regulations that need to be amended/adopted to implement the measure:			Regulation on the list of industrial plants and activities controlling the emission of volatile organic compounds, on the values of emission of volatile organic compounds at a specific consumption of solvents and the total permitted emissions, as well as on the emission reduction scheme ("Official Gazette of the RS" No. 100/11)					
Indicator(s) at the level of the measure (result indicator)	Unit of measurement	Source of verification	Initial value in 2015	Target value in 2022	Target Value in 2023	Target Value in 2024	Target Value in 2025	Target value in the last year of AP, 2026
Enforcement of the IED Chapter V, Annex VII for VOC or Chapter 2 for plants with	t VOC	Electronic registration and	0	0	0	2808	4213	4201

[97] The exact value for the concentration of particulate matter from Table 3 of the Commission Implementing Decision 2016/1032/EU should be determined on the basis of the level of concentration of heavy metals from copper production. Emissions of particulate matter are expected to go towards the lower range of BAT AELs when emissions of heavy metals are above the following values: 1 mg/Nm^3 for lead, 1 mg/Nm^3 for copper, 0,05 mg/Nm^3 for arsenic, 0,05 mg/Nm^3 for cadmium.

solvents consumption larger than 200 t per year or 150 kg per hour		reporting system SEPA						

Source of financing of measures	Link to programme budget	Total estimated financial resources in 000 RSD				
		2022	2023	2024	2025	2026
Donations from the Embassy of the Kingdom of Norway	NO		IE		NO	NO

Title of activity:	Authority implementing the activity	Partner authorities in the implementation of activities	Deadline for completion of activities	Source of financing	Link to programme budget	Total estimated financial resources by sources in 000 RSD				
						2022	2023	2024	2025	2026
1.2.2.1 Amendments to the Regulation on the list of industrial plants and activities in which the emission of VOC is controlled, on the values of the emission of VOC at a certain use of solvents and total permitted emissions, as well as the scheme for	MEP	Local self-governments APVojvodina SEPA	Q4 2023				IE[98]			

[98] The project is ongoing and the funds were provided from the existing SEPA budget.

reducing emissions ("Official Gazette of the Republic of Serbia", No. 100/11).										
1.2.2.2 Continuation of the assessment of the situation in Serbia regarding VOC emissions from the use of solvents in industry and preparation of the list of VOC operators, as well as development, testing and launch of electronic registration and reporting systems for operators classified as VOC operators and capacity building (ongoing project).	MEP	SEPA	Q4 2023	Donations from the Embassy of the Kingdom of Norway SEPA			IE[99]			
1.2.2.3 Implementation of BAT AELs in plants with solvent consumption greater than 200t per year or 150 kg per hour	MEP		Q4 2026	Investors		-	-	-	-	-

[99] The project is ongoing, and the funds were provided from the existing SEPA budget.

Specific objective 1.3: *Reduce NH_3 emissions from Agriculture sector by 20.5% compared to 2015*								
Institution responsible for monitoring and control of implementation: Ministry of Agriculture, Forestry and Water Management								
Indicator(s) at the level of the specific objective (result indicator)	Unit of measurement	Source of verification	Initial value in 2015	Base year value in 2022	Target Value in 2023	Target Value in 2024	Target Value in 2025	Target value in the last year of AP, 2026
Total NH_3 emissions from the agricultural sector (codes K and L)	kt NH_3	SEPA *CRLTAP Inventory*	72.3	70.2	68.3	66.5	64.6	63.8

Measure 1.3.1: **Introduction of best practices for cattle slurry storage**								
Institution responsible for the implementation: Ministry of Agriculture, Forestry and Water Management								
Implementation Period: 2022-2026#			Type of the measure: Information, education					
Regulations that need to be amended/adopted to implement the measure:			Amendments to the existing National Code of Good Agricultural Practice from 2016					
Indicator(s) at the level of the measure (result indicator)	Unit of measurement	Source of verification	Initial value in 2015	Target value in 2022	Target Value in 2023	Target Value in 2024	Target Value in 2025	Target value in the last year of AP, 2026
Share of covered pig manure storages in the total number	%	Annual study of the Agricultural Advisory Service	0	0.5	0.7	0.9	1.2	1.3

The share of manure storage from livestock farms under the layer of natural bark	%	Annual study of the Agricultural Advisory Service	0	1	2.0	1.3	1.7	2.0

Source of financing of measures	Link to programme budget	Total estimated financial resources in 000 RSD				
		2022	2023	2024	2025	2026
Budget RS	0101-420-0001-411		30.550*	30.550*	30.550*	30.550*
EU financial assistance/donors	Donor funds		47.000*	47.000*	0	0
EU financial assistance / donors /budget	donor funds /0102-420-0003-423			5.875*	12.827*	86.617*

Title of activity:	Authority implementing the activity	Partner authorities in the implementation of activities	Deadline for completion of activities	Source of financing	Link to programme budget	Total estimated financial resources by sources in 000 RSD				
						2022	2023	2024	2025	2026
1.3.1.1 Transposition of the six principles of nitrogen management presented in Annex 3, Part 2 of Directive 2284/2016, which are also	Ministry of Agriculture, Forestry and Water Management	MEP, SEPA	Q4 2024			-	-	-	-	-

Title of activity:	Authority implementing the activity	Partner authorities in the implementation of activities	Deadline for completion of activities	Source of financing	Link to programme budget	Total estimated financial resources by sources in 000 RSD				
						2022	2023	2024	2025	2026
listed in Annex 9 of the Gothenburg Protocol, into the national legal framework										
1.3.1.2 Preparation of the National Code of Good Agricultural Practice for the control of ammonia emissions by supplementing and expanding the existing National Code of Good Agricultural Practice of 2016 to better consider measures to reduce NH_3	Ministry of Agriculture, Forestry and Water Management	MEP, AP Vojvodina Local self-government units, SEPA	Q4 2023	-		-	-	-	-	-

Title of activity:	Authority implementing the activity	Partner authorities in the implementation of activities	Deadline for completion of activities	Source of financing	Link to programme budget	Total estimated financial resources by sources in 000 RSD				
						2022	2023	2024	2025	2026
emissions in line with UNECE and EU requirements										
1.3.1.3 Establish a national nitrogen budget to monitor changes in total reactive nitrogen losses from agriculture, including ammonia, nitrous oxide, ammonium, nitrates and nitrites, based on the principles set out in the UNECE Guide to Nitrogen Budgets.	Ministry of Agriculture, Forestry and Water Management	MEP, SEPA	Q4 2024	Donor funds	[…]		47,000	47,000		

Title of activity:	Authority implementing the activity	Partner authorities in the implementation of activities	Deadline for completion of activities	Source of financing	Link to programme budget	Total estimated financial resources by sources in 000 RSD				
						2022	2023	2024	2025	2026
1.3.1.4 Strengthening human resources in the Ministry of Agriculture, Forestry and Water Management (3 full-time employees required for the development of the National Advisory Code, organisation of Agricultural Advisory Services and dissemination of good practice in an integrated approach) and Agricultural Extension and Professional Service (10	Ministry of Agriculture, Forestry and Water Management	Agricultural extension and professional services	Q4 2023	Budget			30.550	30.550	30.550	30.550

Title of activity:	Authority implementing the activity	Partner authorities in the implementation of activities	Deadline for completion of activities	Source of financing	Link to programme budget	Total estimated financial resources by sources in 000 RSD				
						2022	2023	2024	2025	2026
full-time employees) over time to expand ammonia reduction measures and protect groundwater bodies).										
1.3.1.5 Information and dissemination of the National Code of Good Agricultural Practice and development of awareness campaigns on the impact of NH_3 emissions on air quality and measures to reduce them (through	Ministry of Agriculture, Forestry and Water Management (Sector for Agrarian Policies, Veterinary Directorate, Directorate for Agricultural Land)	Agricultural professional and extension services	Q4 2026	donors funds or budget	0102-420-0003-423				6.953	6.953

Title of activity:	Authority implementing the activity	Partner authorities in the implementation of activities	Deadline for completion of activities	Source of financing	Link to programme budget	Total estimated financial resources by sources in 000 RSD				
						2022	2023	2024	2025	2026
several events (5 per year in Serbia from 2024), development and dissemination of promotional materials (leaflets, videos)…): 10), websites (1))										
1.3.1.6 Implementation of best practices for manure storage	Ministry of Agriculture, Forestry and Water Management		Q4 2026	Investors		-	-	-	-	-
1.3.1.7 Strengthening the technical capacity of farmers on best practices in manure spreading and other best practices (15	Ministry of Agriculture, Forestry and Water Management	Agricultural professional and extension services	Q4 2026	donors funds or budget	0102-420-0003-423			5.875	5,875	82.838

Title of activity:	Authority implementing the activity	Partner authorities in the implementation of activities	Deadline for completion of activities	Source of financing	Link to programme budget	Total estimated financial resources by sources in 000 RSD				
						2022	2023	2024	2025	2026
per year from 2024), development of special guidelines).										
1.3.1.8 Complete the issuance of integrated farm permits based on the application of best available techniques.	MEP		Q4 2025	Budget RS		IE	IE	IE	IE	IE
1.3.1.9 Conduct an annual survey on the application of best practice on farms.#	Ministry of Agriculture, Forestry and Water Management		Q4 2026	Budget RS				IE[100]	IE	IE

[100] Costs included in the measure 1.3.1.7.

Measure 1.3.2: **Substitution of urea-based fertilizers with ammonium nitrate-based fertilizers**								
Institution responsible for the implementation: Ministry of Agriculture, Forestry and Water Management								
Implementation Period: 2023-2026#			Type of the measure: Information, education					
Regulations that need to be amended/adopted to implement the measure:			NA					
Indicator(s) at the level of the measure (result indicator)	Unit of measurement	Source of verification	Initial value in 2015	Target value in 2022	Target Value in 2023	Target Value in 2024	Target Value in 2025	Target value in the last year of AP, 2026
Urea content in total applied mineral nitrogen fertilizer (%)	%	Annual study of the Advisory Service on best practices	29.2	29.2	28.6	28.1	27.5	26.4
Ammonium nitrate content in total applied mineral nitrogen fertilizer (%)	%	Annual study of the Advisory Service on best practices	50.2	50.2	50.7	51.3	51.8	53

Source of financing of measures	Link to programme budget	Total estimated financial resources in 000 RSD				
		2022	2023	2024	2025	2026

Budget RS EU financial assistance	IE[101]	IE	IE	IE	IE	IE

Title of activity:	Authority implementing the activity	Partner authorities in the implementation of activities	Deadline for completion of activities	Source of financing	Link to programme budget	Total estimated financial resources by sources in 000 RSD				
						2022	2023	2024	2025	2026
1.3.2.1 Introduction of the best practice for the storage of liquid manure through horizontal activities	Ministry of Agriculture, Forestry and Water Management		2022-Q4 2026	Budget RS			IE [102]	IE	IE	IE
1.3.2.2 Substitution of urea-based fertilizers with ammonium nitrate-based fertilizers	Ministry of Agriculture, Forestry and Water Management		Q4 2026	Investors		-	-	-	-	-

Measure 1.3.3: **Introduction of the best practices at spreading for solid manure application by faster incorporation of manure in the soil**		
Institution responsible for the implementation: Ministry of Agriculture, Forestry and Water Management		
Implementation Period: 2023-2030	Type of the measure: Information, education	
Regulations that need to be amended/adopted to implement the measure:	None	

[101] Included in measure 1.3.1.

[102] Costs included in activity 1.3.1.4.

Indicator(s) at the level of the measure (result indicator)	Unit of measurement	Source of verification	Initial value in 2015	Target value in 2022	Target Value in 2023	Target Value in 2024	Target Value in 2025	Target value in the last year of AP, 2026
Share of total solid manure from pig farms - incorporation within 12 hours	%	Annual study of the Extension Service on best practices	1.6	1.6	2.2	2.8	3.4	3.9
Share of total solid manure from pig farms - incorporation within 4 hours	%		7.7	7.7	9.0	10.3	11.7	13.0
Share of total solid manure from poultry farms - incorporation of poultry manure within 12 hours	%		5.7	5.7	7.7	9.6	11.6	13.6
Share of total solid manure from poultry farms - incorporation of poultry manure within 4 hours	%		7.7	7.7	9.0	10.3	11.7	13.0
Share of total cattle manure - incorporation within 24 hours	%		7.7	7.7	9.0	10.3	11.7	13.0
Share of total cattle manure - incorporation within 12 hours	%		7.0	7.0	8.0	9.0	10.0	11.0

Share of total cattle manure - incorporation within 4 hours	%		0.7	0.7	1.0	1.3	1.7	2.0

Source of financing of measures	Link to programme budget	Total estimated financial resources in 000 RSD				
		2022	2023	2024	2025	2026
Budget RS EU financial assistance	IE		IE	IE	IE	IE

Title of activity:	Authority implementing the activity	Partner authorities in the implementation of activities	Deadline for completion of activities	Source of financing	Link to programme budget	Total estimated financial resources by sources in 000 RSD				
						2022	2023	2024	2025	2026
1.3.3.1 Introduction of the best practice through education	Ministry of Agriculture, Forestry and Water Management		2022-Q4 2026	Budget RS			IE	IE	IE	IE
1.3.3.2 Implement best practices at spreading for solid manure application by faster incorporation of manure in the soil	Ministry of Agriculture, Forestry and Water Management		Q4 2026	Investors		-	-	-	-	-

Measure 1.3.4: **Introduction of best practices at spreading for pig and cattle slurry**								
Institution responsible for the implementation: Ministry of Agriculture, Forestry and Water Management								
Implementation Period: 2023-2026#			Type of the measure: Information, education					
Regulations that need to be amended/adopted to implement the measure:			NONE					
Indicator(s) at the level of the measure (result indicator)	Unit of measurement	Source of verification	Initial value in 2015	Target value in 2022	Target Value in 2023	Target Value in 2024	Target Value in 2025	Target value in the last year of AP, 2026
Share of total pig slurry - Injection	%	Annual study of the Advisory Service on best practices	9.7	9.7	12.0	14.3	16.7	19.0
Share of total pig slurry - Hose and connection system within 4 hours	%		2.1	2.1	3.0	4.0	4.9	5.8
Share of total pig slurry - Hose and connection system within 12 hours	%		0.7	0.7	1.1	1.4	1.8	2.1
Share of total cattle slurry - Injection	%		7.0	7.0	8.0	9.0	10.0	11.0
Share of total cattle slurry - Hose and connection system within 4 hours	%		6.3	6.3	7.0	7.7	8.3	9.0
Share of total cattle slurry - Hose and connection system within 12 hours	%		6.3	6.3	7.0	7.7	8.3	9.0

Source of financing of measures	Link to programme budget	Total estimated financial resources in 000 RSD				
		2022	2023	2024	2025	2026
Budget RS EU financial assistance	IE		IE	IE	IE	IE

Title of activity:	Authority implementing the activity	Partner authorities in the implementation of activities	Deadline for completion of activities	Source of financing	Link to programme budget	Total estimated financial resources by sources in 000 RSD				
						2022	2023	2024	2025	2026
1.3.4.1 Introduction of best practice through farmer education	Ministry of Agriculture, Forestry and Water Management		2022-Q4 2026	Budget RS			IE	IE	IE	IE
1.3.4.2 Implementation of best practice in slurry spreading from pig and cattle farms through improvement of agricultural machinery (injectors and manure spreading hoses).	Ministry of Agriculture, Forestry and Water Management		2023-Q4 2026	Investors		-	-	-	-	-

Measure 1.3.5: **Limitation of the burning of agricultural residues (0% in 2030)**								
Institution responsible for the implementation: Ministry of Agriculture, Forestry and Water Management								
Implementation Period: 2023-2026#			Type of the measure: Regulatory					
Regulations that need to be amended/adopted to implement the measure:								
Indicator(s) at the level of the measure (result indicator)	Unit of measurement	Source of verification	Initial value in 2015	Target value in 2022	Target Value in 2023	Target Value in 2024	Target Value in 2025	Target value in the last year of AP, 2026
Share of total burnt corn residues	%	Agricultural inspection	17.0	17.0	15	12	9.8	7.9
Share of total burnt wheat residues	%	Agricultural inspection	9.1	9.1	8	7	5.2	4.2

Source of financing of measures	Link to programme budget	Total estimated financial resources in 000 RSD				
		2022	2023	2024	2025	2026
Budget revenues EU financial assistance	0102-420-0003-423		4.700*	4.700*	4.700*	4.700*

Title of activity:	Authority implementing the activity	Partner authorities in the implementation of activities	Deadline for completion of activities	Source of financing	Link to programme budget	Total estimated financial resources by sources in 000 RSD				
						2022	2023	2024	2025	2026
1.3.5.1 Information and dissemination of the National Code of Good Agricultural Practice and development of awareness campaigns on the impact of field burning of agricultural residues on air quality and measures to reduce field burning (through several events (1 in Serbia since 2023), drafting and dissemination of promotional materials (leaflets, videos): 5), websites (1))	Ministry of Agriculture, Forestry and Water Management	Agricultural Extension and Professional services	Q4 2026	Budget	0102-420-0003-423		2,644	2,644	2,644	2,644
1.3.5.2 Restriction of field burning of agricultural residues in open investment in agricultural machinery in order to incorporate	Ministry of Agriculture, Forestry and Water Management		Q4 2026	Investors		-	-	-	-	-

agricultural residues into the land.										
1.3.5.3 Strengthening the technical capacity of farmers in terms of best harvest practices and other best practices (special training for farmers (2 per year since 2024).	Ministry of Agriculture, Forestry and Water Management	Agricultural extension and professional services	Q4 2026	Budget	0102-420-0003-423		2,056	2,056	2,056	2,056

Specific objective 1.4: ***Promote transition to clean air for everyone***								
Institution responsible for monitoring and control of implementation: Ministry of Environmental Protection								
Indicator(s) at the level of the specific objective (result indicator)	Unit of measurement	Source of verification	Initial value in 2015	Target value in 2022	Target Value in 2023	Target Value in 2024	Target Value in 2025	Target value in the last year of AP, 2026
Implemented awareness-raising activities among stakeholders regarding air pollution and its potential impacts on the society	Yes/No	*Activities of the Awareness Evaluation and Monitoring Plan*	No	No	yes	yes	yes	Yes
Share of households informed about the proper use of firewood in small heating appliances	%	*Activities of the Awareness Evaluation and*	0	0	20	40	50	60

		Monitoring Plan						
Share of zones and agglomerations visited by the mobile demonstration center (or equivalent demonstration concept)	%	*Activities of the Awareness Evaluation and Monitoring Plan*	0	0	0	20	50	70

Measure 1.4.1: **Education on air quality, training for implementation of best practices and awareness raising**								
Institution responsible for the implementation: MEP								
Implementation Period: 2023-2026			Type of the measure: Information, education					
Regulations that need to be amended/adopted to implement the measure:			NA					
Indicator(s) at the level of the measure (result indicator)	Unit of measurement	Source of verification	Initial value in 2015	Target value in 2022	Target Value in 2023	Target Value in 2024	Target Value in 2025	Target value in the last year of AP, 2026
Prepared recommendation on health impacts, informed 80% of households and disseminated knowledge on the proper use of devices that use solid fuel as an energy source	YES/NO	MEP	No data	-	-	-	YES	YES

Source of financing of measures	Link to programme budget	Total estimated financial resources in 000 RSD				
		2022	2023	2024	2025	2026
EU financial assistance	Donor funds		11.750*	41.125*	41.125*	11.750*

Title of activity:	Authority implementing the activity	Partner authorities in the implementation of activities	Deadline for completion of activities	Source of financing	Link to programme budget	Total estimated financial resources by sources in 000 RSD				
						2022	2023	2024	2025	2026
1.4.1.1 Education: implementation of environmental protection and air quality projects and the role of children in its preservation.	Ministry of Education	MEP, Ministry of Health, Local Self-Government Units, AP Vojvodina, SEPA, Serbian Chamber of Commerce, research institutions	Q4 2025	Donor funds	[…]			29,375	29,375	
1.4.1.2 Capacity building, awareness raising campaigns and counselling to the households about the proper use of small appliances using solid fuels and conducting the assessment of the	Ministry of Mining and Energy		Q4 2026	Donor funds	[…]		11.750	11.750	11.750	11.750

moisture content of the wooden biomass.										
1.4.1.3 Establishing of the mobile demonstration centre (or equivalent) for knowledge sharing regarding the proper use of biomass in small appliances and boilers	Ministry of Mining and Energy									

ANNEX 1

INFORMATION ON THE CONSULTATIVE PROCESS IN THE PREPARATION OF THE PROGRAMME

1 Introduction

This article presents the results of a multi-criteria analysis of three scenarios with additional measures (WAM A, WAM B and WAM C), developed within the drafting of the Programme.

The questionnaire was open for participation since 13 September to 13 October 2021.

The results of this questionnaire serve to support the decision-making process on the preparation of the draft Programme, but they do not represent an obligation to be fulfilled neither technically nor politically. The results of this questionnaire are only a means for support, not for making policy decisions.

Stakeholder engagement in this phase of the technical process is in line with international best practice in the field of public participation. It does not replace additional public hearing procedures conducted in accordance with the law of the Republic of Serbia.

In order to support stakeholder participation in the analysis, a brochure with key information on three criteria (environment, health and economy) was developed in relation to three scenarios with additional measures (WAM A, WAM B and WAM C). The parties concerned are instructed to read the brochure before completing the questionnaire. It is estimated that at least 30 minutes are needed for effective and informed participation in this stakeholder analysis.

Technical information in the brochure should be understandable to a wide range of stakeholders, with very different qualifications, interests and experiences. The brochure as such contains only a small part of the technical information from the project, and the descriptions are given in plain language.

2 Categorisation of respondents

The largest group of respondents (27%) consists of representatives of local self-government units, followed by stakeholders who participate on their own behalf (citizens) with 19%, the same percentage as stakeholders who identify themselves with any other category. Representatives of public companies make up 15% of respondents, and members of the Working Group 8%. Representatives of the Government, non-governmental organisations and the academic community are represented by 4% of respondents each.

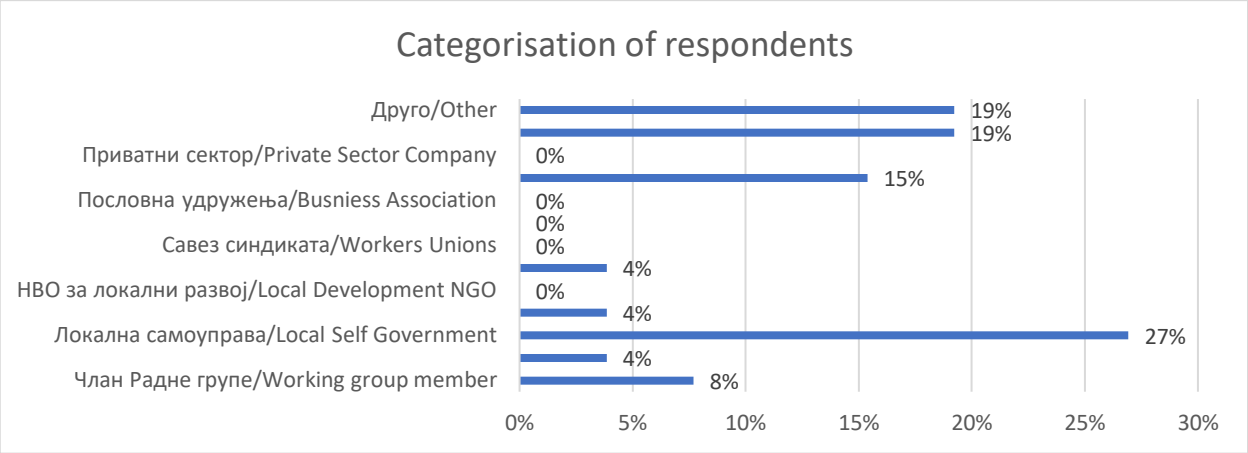


Figure 29 – Categorisation of respondents

Three scenarios with additional measures from the draft Programme have localised impacts, in terms of benefits. Therefore, it was important to understand how the results of different scenarios in the cities where the respondents lived or worked influenced their decisions. The vast majority of respondents (69%) stated that their response was not influenced by the results of the scenario for their city, while 31% answers were affirmative.

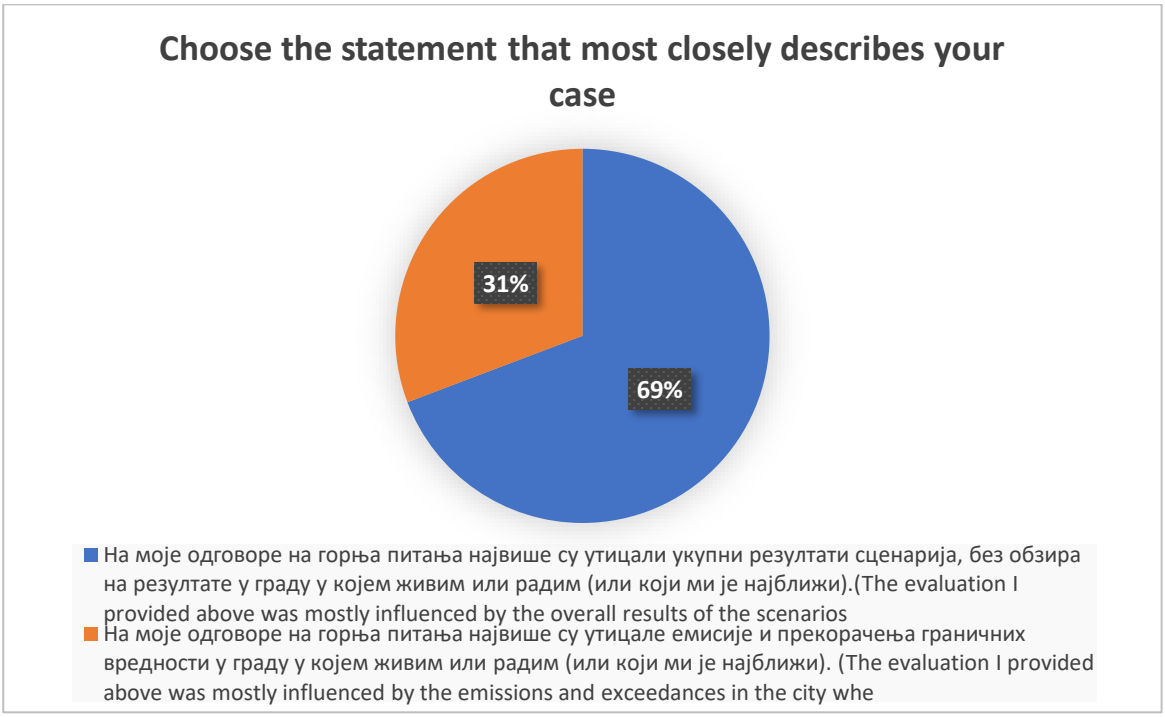


Figure 30- The impact of the applied scenario in the respondent's city, based on the answers to the questionnaire

3. Scoring of criteria for the environment, health and economy from the multi-criteria analysis

Scoring of criteria is an important element of multi-criteria analysis: it is essential to assess the importance that stakeholders attach to each criterion. This will ensure that the analysis of the evaluation of different indicators takes into account the relative importance (points) that stakeholders attach to each criterion.

Three criteria were used in this analysis: environment, health and economy.

The cost-benefit indicator is a combination of health and economic criteria.

As can be seen in the Table below, **stakeholders attached the greatest importance to health** (4.36), followed by the **environment** (4.27) and, finally, **economic criteria** (4.04)[103].

The score of each indicator is multiplied by the score of the corresponding criterion in order to ensure the correct interpretation of the results.

The costs-benefit score is multiplied by the score expressed as an average score of health and economic criteria.

The score of each indicator presented in the next section has already been multiplied by the score for each criterion.

Table 4 – Stakeholders' evaluation for each criterion

	Environment	Health	Economy	(Costs and benefits)
Average	4.27	4.36	4.04	(4.20)
Mean	5	5	4	(4.5)

4 Questions based on technical data from the accompanying document

4.1 Environmental criteria

How satisfied are you with the PM10 emission reductions achieved with scenario WAM A, WAM B and WAM C?

Respondents are **most satisfied** with the reduction in PM_{10} emissions achieved under **WAM C** scenario (average score 32.18), followed by WAM B scenario (24.47) and finally WAM A (20.53).

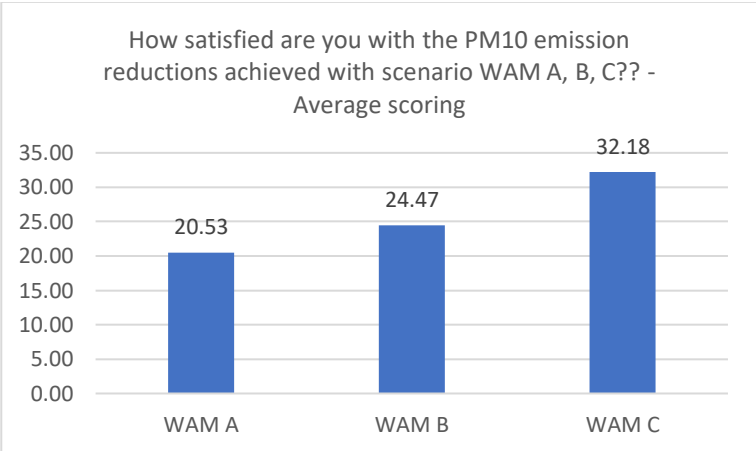


Figure 31 - How satisfied are you with the PM10 emission reductions achieved with scenario WAM A, B, C? - Average scoring

[103] The mean score here serves only as a reference, although the mean score of the indicator is multiplied by the mean score of the corresponding criterion.

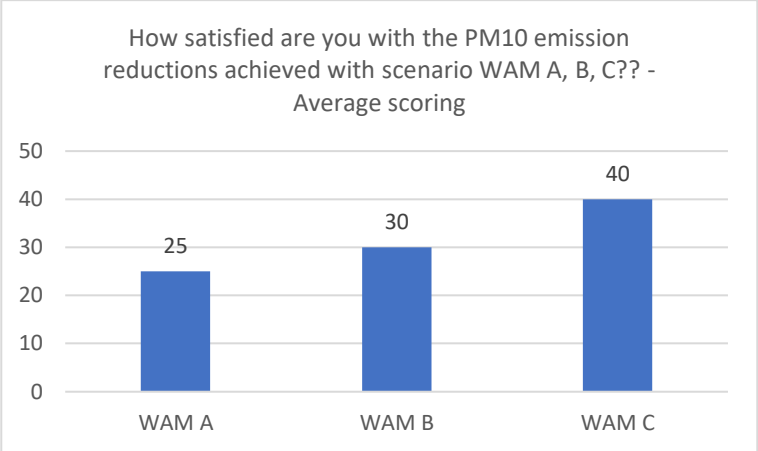


Figure 32 - How satisfied are you with the PM10 emission reductions achieved with scenario WAM A, B, C? - Average scoring

How satisfied are you with the number of exceedances of any air pollutants in your city (or the one closest to you) estimated in WAM A, WAM B and WAM C?

Respondents are **most satisfied** with the number of days of exceeding the PM_{10} limit values achieved under **WAM C** scenario (average score 30.87), followed by WAM B scenario (21.84) and finally WAM A (18.39).

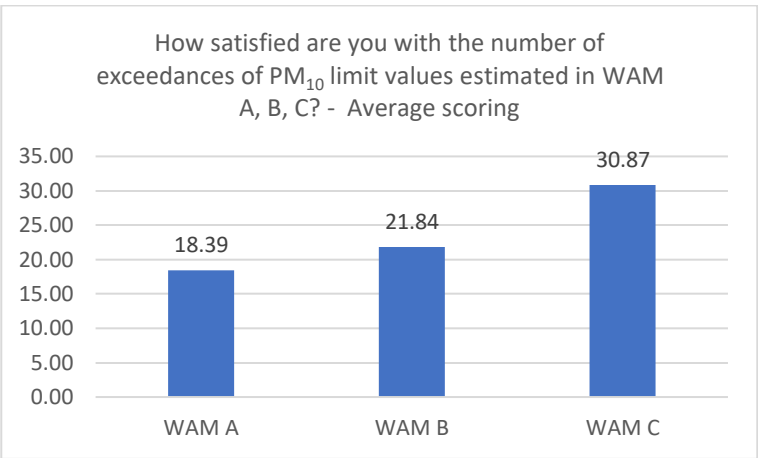


Figure 33 – How satisfied are you with the number of days of exceeding the PM_{10} limit values estimated in WAM A, WAM B and WAM C? - Average scoring

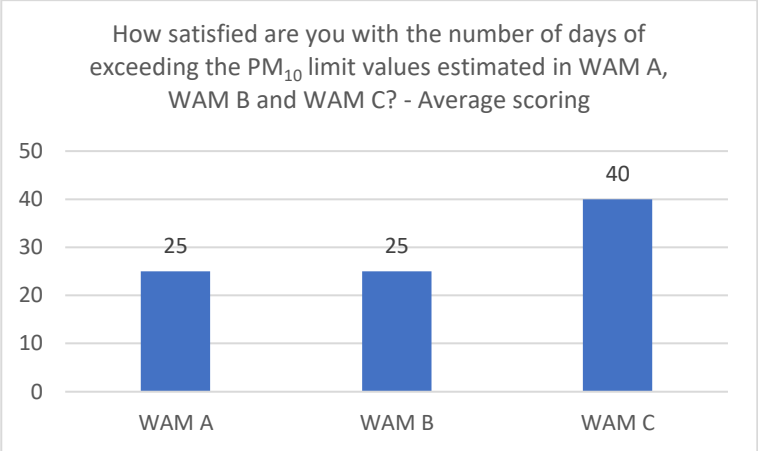


Figure 34 – How satisfied are you with the number of days of exceeding the PM_{10} limit values estimated in WAM A, WAM B and WAM C? - Average scoring

How satisfied are you with the number of days of exceeding the the limit values of any pollutant in their city (or nearby city) in WAM A, WAM B and WAM C?

Respondents are **most satisfied** with the number of days of exceeding the limit values of any pollutant in their city (or nearby city) achieved under the **WAM C** scenario (average score 30.87), then WAM B (24.63) and finally WAM A (22 ,5)

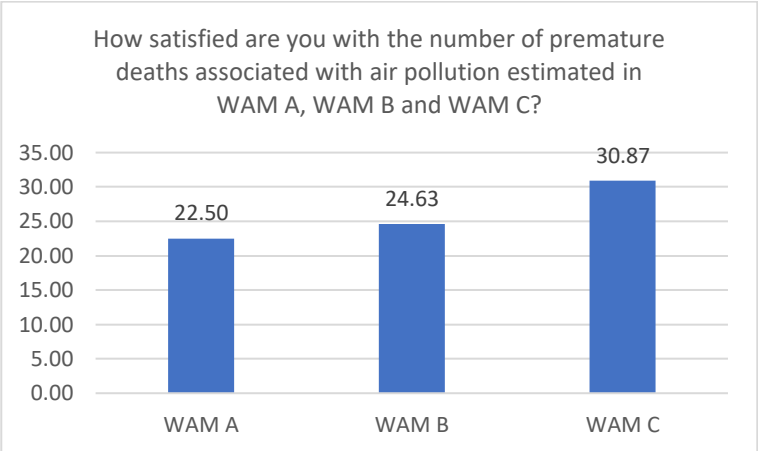


Figure 35 –How satisfied are you with the estimate of the number of days of exceeding the limit values of any pollutant in your city (or nearby city) under WAM A, WAM B and WAM C? - Average scoring

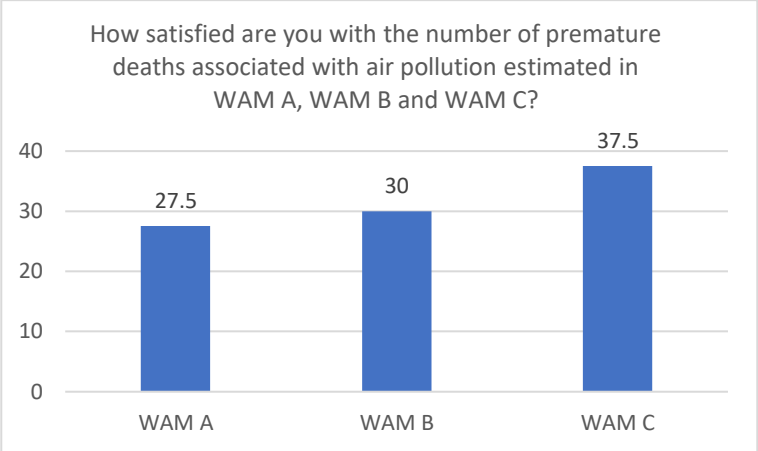


Figure 36 – How satisfied are you with the estimate of the number of days of exceeding the limit values of any pollutant in your city (or nearby city) under WAM A, WAM B and WAM C? - Average scoring

In summary, for all three indicators subject to the assessment of environmental criteria, **WAM C was in any case the most desirable choice of stakeholders**, followed by WAM B and WAM A.

4.2 Health criteria

How satisfied are you with the estimate of the number of premature deaths related to air pollution within WAM A, WAM B and WAM C?

Respondents are **most satisfied** with the numbers related to the number of premature deaths due to poor air exposure from the assessment according to the **WAM C** scenario (average score 25.82), followed by WAM B (22.30) and WAM A (17.44).

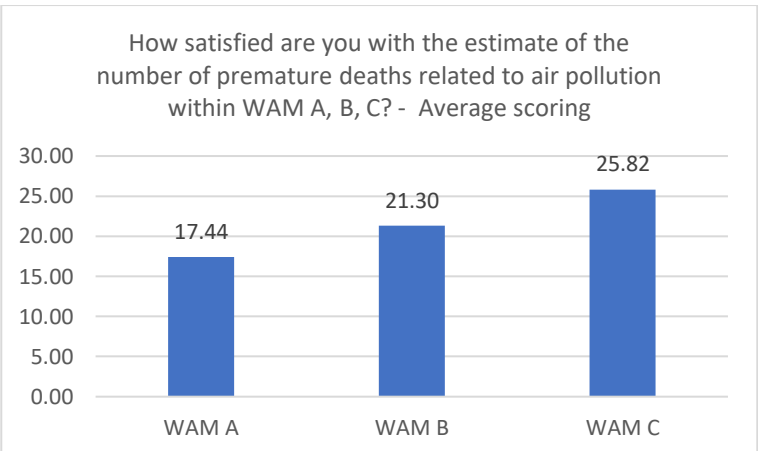


Figure 37 – How satisfied are you with the estimate of the number of premature deaths related to air pollution within WAM A, WAM B and WAM C? - **Average scoring**

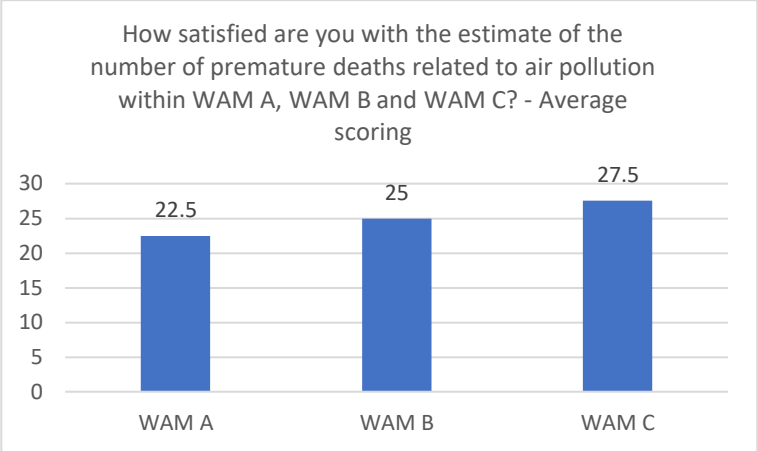


Figure 38 – How satisfied are you with the estimate of the number of premature deaths related to air pollution within WAM A, WAM B and WAM C? - Average scoring

For the indicator related to health criteria, **WAM C was in any case the most desirable choice of stakeholders**, followed by WAM B and WAM A.

4.3 Economic criteria

How satisfied are you with the estimated additional costs for implementing WAM A, WAM B and WAM C?

Respondents are **most satisfied** with the assessment of the additional costs of implementing the **WAM C** scenario (average score 28.58), followed by WAM B (24.54) and finally WAM A (23.14).

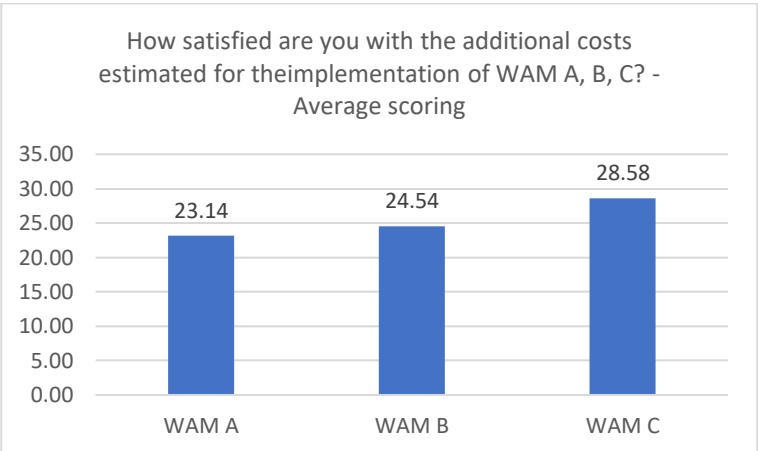


Figure 39 – How satisfied are you with the estimated additional costs for implementing WAM A, WAM B and WAM C? – Average scoring

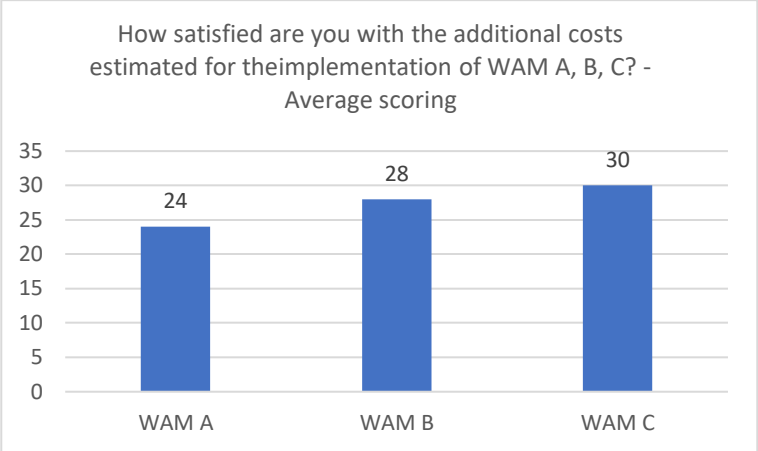


Figure 40 – How satisfied are you with the estimated additional costs for implementing WAM A, WAM B and WAM C? - Average scoring

How satisfied are you with the assessment of net benefits (cost-benefit ratio) within WAM A, WAM B and WAM C?

Respondents are **most satisfied** with the assessment of net benefits of implementing the **WAM C** scenario (average score 29.93), followed by WAM B (25.03) and WAM A (22.45)..

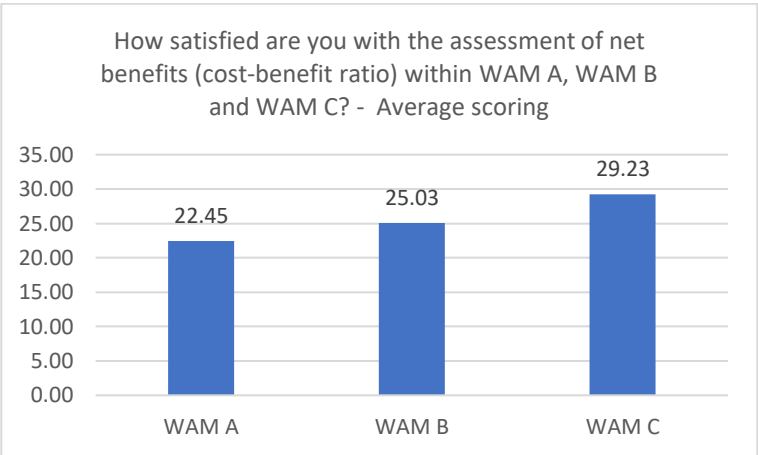


Figure 41 – How satisfied are you with the assessment of net benefits (cost-benefit ratio) within WAM A, WAM B and WAM C? – Average scoring

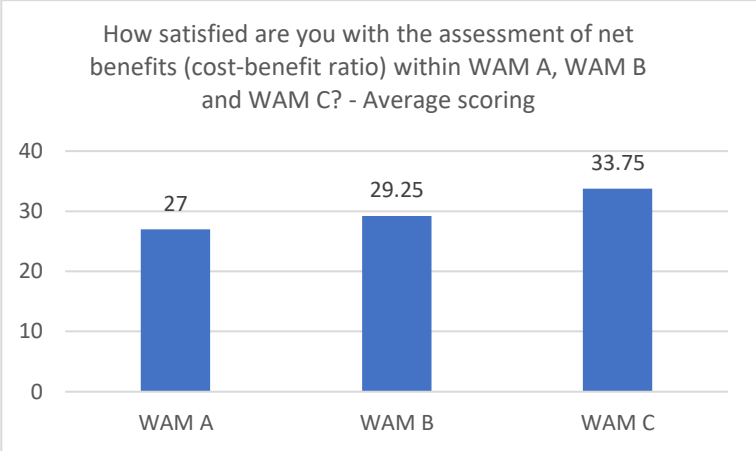


Figure 42 – How satisfied are you with the assessment of net benefits (cost-benefit ratio) within WAM A, WAM B and WAM C? - Average scoring

In summary, for two indicators subject to the assessment of economic criteria, **WAM C was in any case the most desirable choice of stakeholders**, followed by WAM B and WAM A.

5 Other questions based on the respondents' assessment

Which scenario do you think contributes the most to combating climate change?

69% of respondents believe that **WAM C contributes the most to combating climate change**, followed by the answers "**all the same**" (15%) and "**I do not know**" (12%).

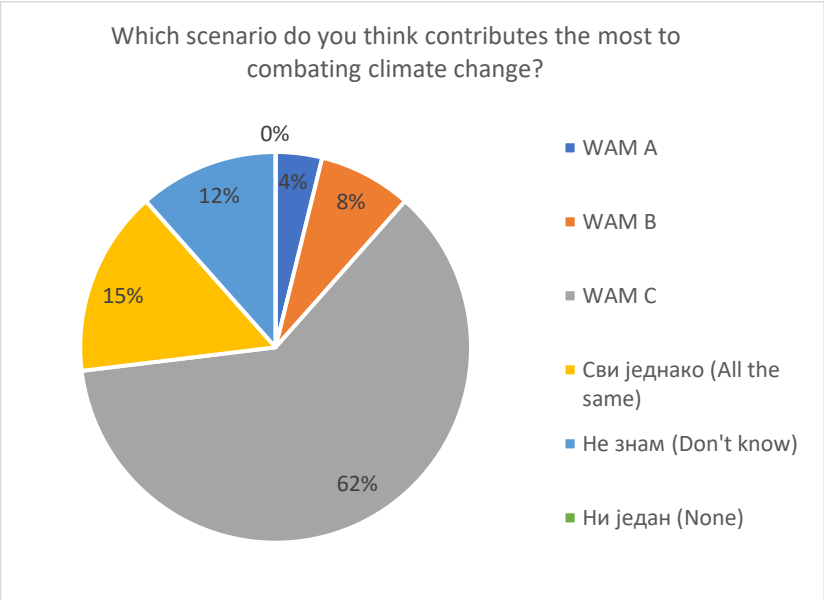


Figure 43 – Which scenario do you think contributes the most to combating climate change?

Which scenario do you think contributes the most to biodiversity protection?

44% of respondents say that **WAM C contributes the most to the protection of biodiversity**, followed by the answers "I don't know" (32%) and finally WAM A and "all the same" (12% each).

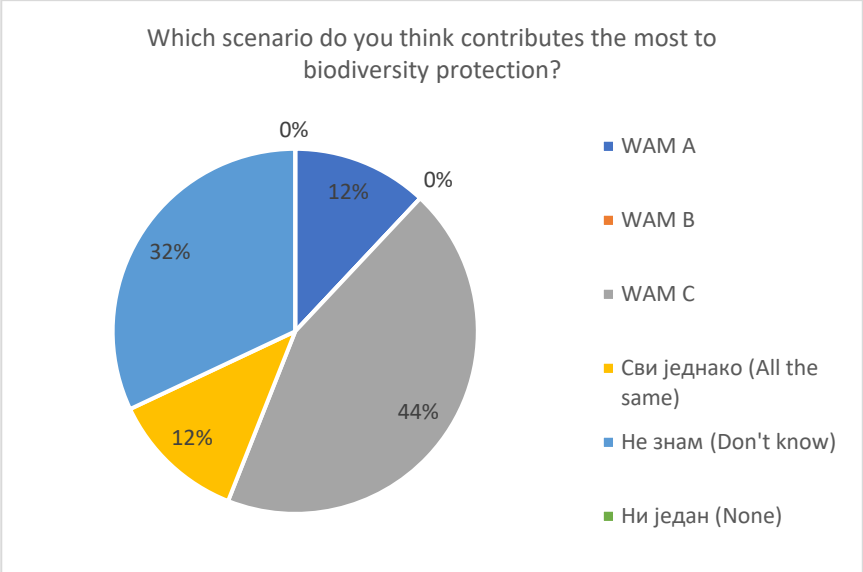


Figure 44 – **Which scenario do you think contributes the most to biodiversity protection**?

Which scenario do you think contributes the most to eradication of poverty?

27% of respondents believe that none of the scenarios contributes to eradication of poverty, followed by "I don't know" answers with 23%, followed by 19% of respondents who believe that WAM C contributes the best to eradication of poverty.

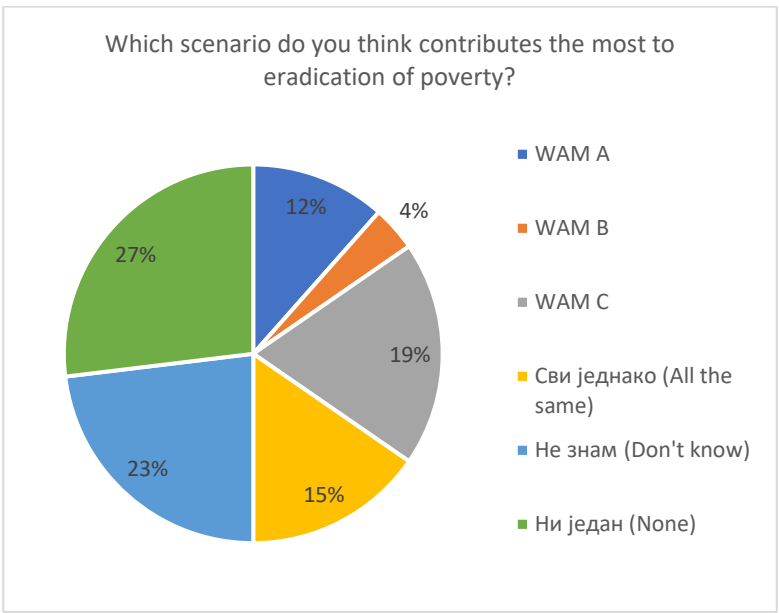


Figure 45 – Which scenario do you think contributes the most to eradication of poverty?

Which scenario do you think contributes the most to gender equality?

31% of respondents believe that none of the scenarios contributes to gender equality, followed by 27% of those who believe that all contribute equally, and 23% who say they do not know.

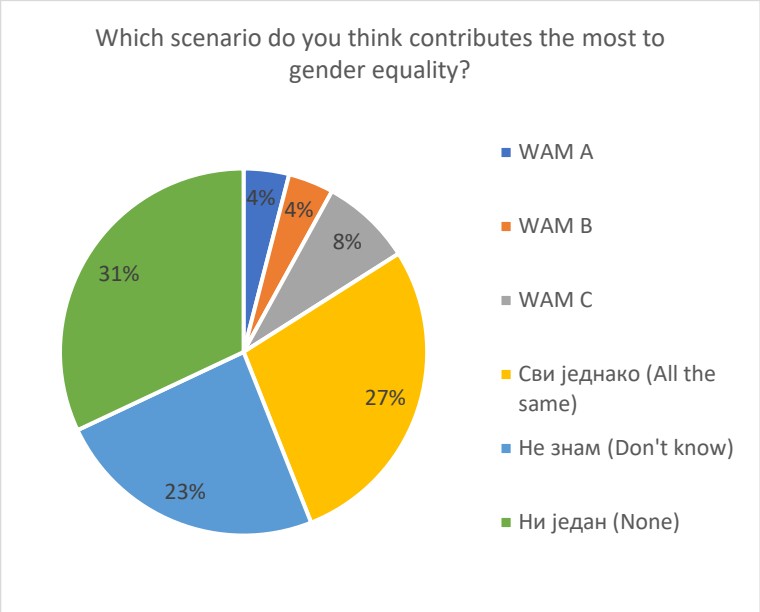


Figure 47 - Which scenario do you think contributes the most to gender equality?

Which scenario do you think contributes the most to improving life in rural areas?

31% of respondents believe that WAM C will contribute the best to the improvement of life in rural areas, followed by WAM B and the answer "all the same" (19% each).

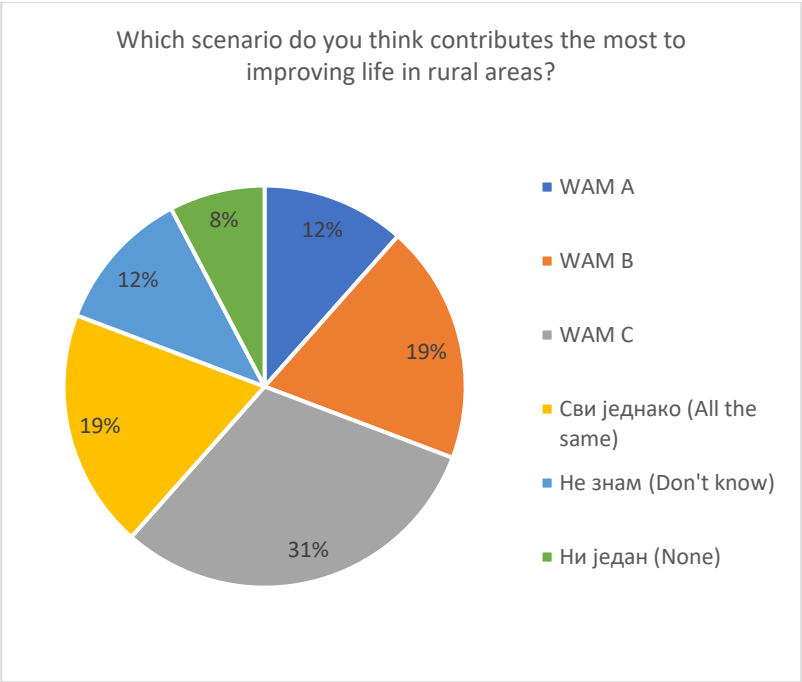


Figure 46 – Which scenario do you think contributes the most to improving life in rural areas?

Which scenario do you think contributes the most to improving life in cities?

54% of respondents believe that WAM C contributes best to improving life in cities, followed by 27% of those who believe that "all the same" contribute, and finally WAM B and "I do not know" (8% each).

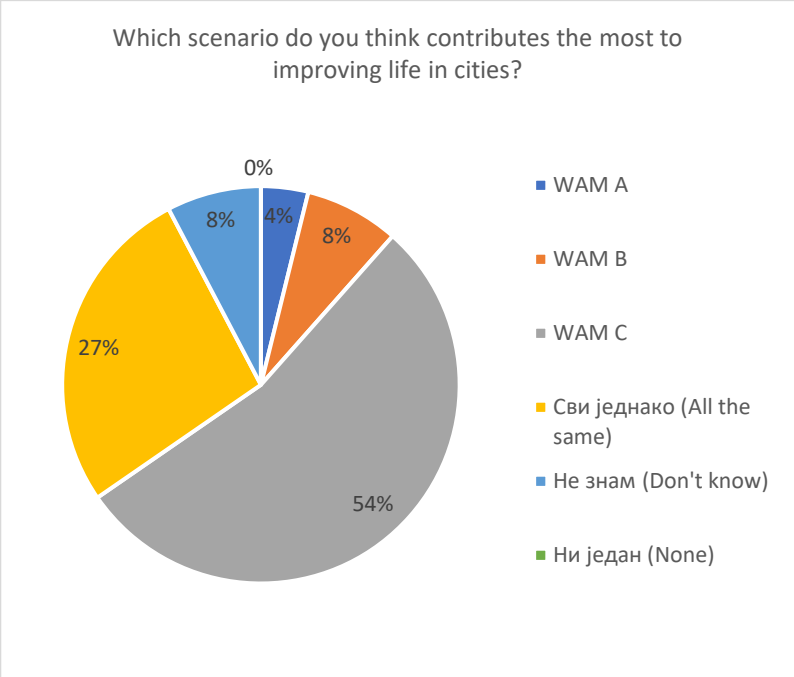


Figure 47 – Which scenario do you think contributes the most to improving life in cities?

Which scenario do you think contributes the most to job creation?

54% of respondents believe that WAM C contributes the most to job creation, followed by "all the same" (27%) and "I don't know" (23%).

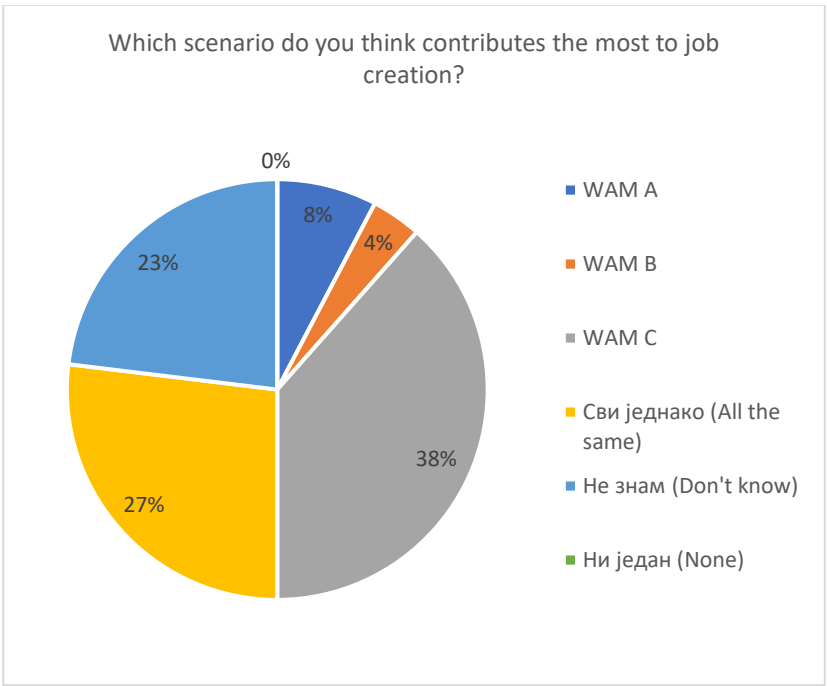


Figure 48 – Which scenario do you think contributes the most to job creation?

Which scenario do you think contributes the most to energy security of the Republic of Serbia?

35% of respondents believe that WAM C contributes the most to the energy security of the Republic of Serbia, followed by 31% of those who believe that all contribute equally, and 15% each WAM A and "I do not know".

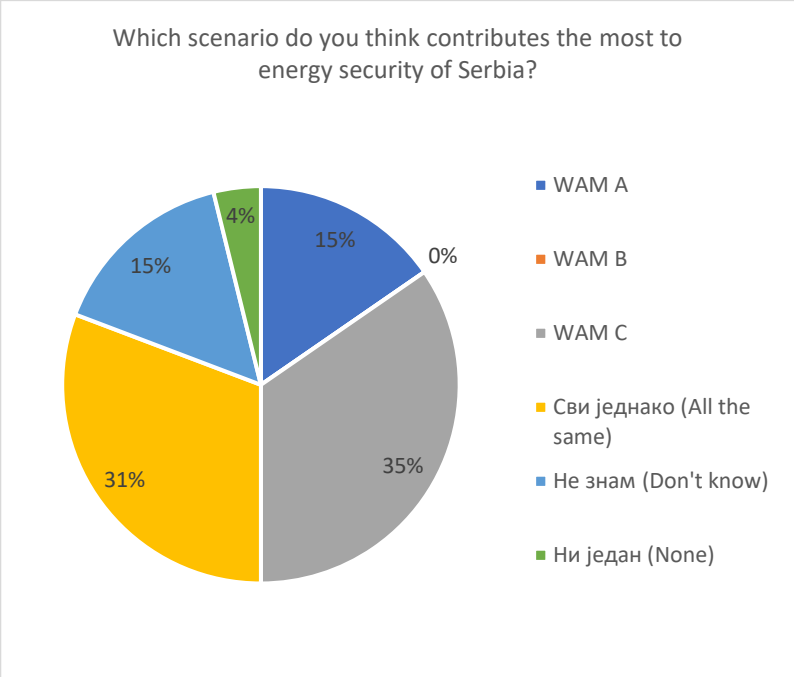


Figure 49 – Which scenario do you think contributes the most to energy security of the Republic of Serbia?

Which scenario do you think is the best for your city?

62% of respondents think that WAM C is the best for their city, followed by the answers "all are the same" (19%) and WAM A and "I don't know" (8% each).

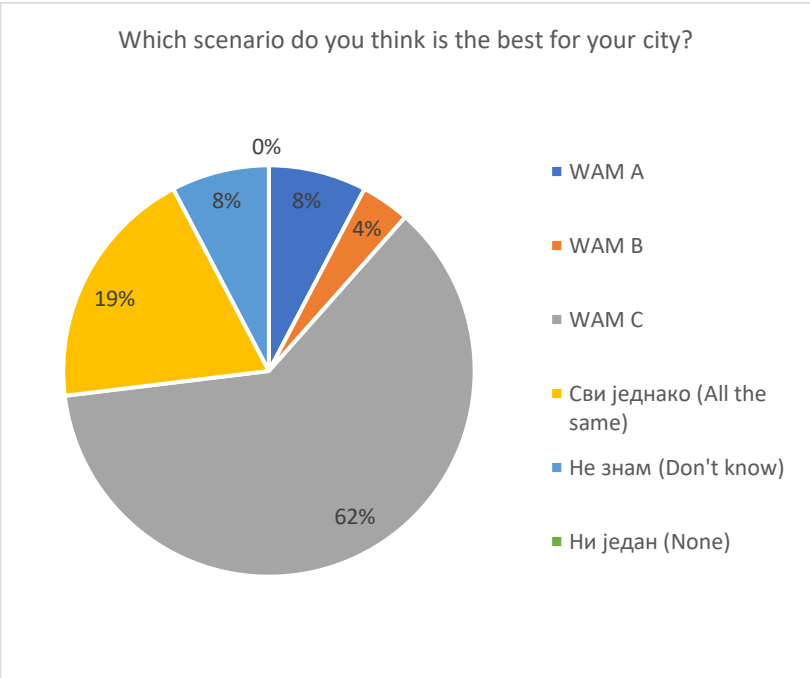


Figure 50 – Which scenario do you think is the best for your city?

In summary, in the answers to the questions (which were not mandatory) based on the views of the stakeholders (in other words, the accompanying document does not contain technical information on this issue) a greater diversity is observed, for example, the answers "all the same" and "I don't know", have a larger share than the answers for the indicators for which technical

information were provided in the accompanying document. For this segment also WAM C was the scenario with the most votes compared to the other two.

6 Additional information on the consultative processes

In order to prepare a draft Programme, as well as Specific plans for the implementation of Air Quality Directives (DSIPs), important for the development of the Programme, on October 24, 2019 the following were formed: Working group for monitoring and evaluation of progress in drafting the Programme of Air Protection and Action Plan (11 meetings in total held), Working group for monitoring and evaluation of progress in drafting the Specific plan for implementation of directives 2008/50/EC, 2004107/EC and 2015/1480/EU (ambient air quality) and the Specific plan for the implementation of the NEC Directive 2016/2284/EU (national emission reduction commitments) (held a total of six meetings) and Working group for monitoring and evaluation of progress in drafting the Specific plan for the implementation of the VOC Petrol Directives (94/63/EC, 2009/126/EC and 2014/99/EU) (5 meetings in total).

The first conference on the draft Programme was held on April 16, 2021, at which preliminary results were presented with emission projections in relation to two scenarios (WAM A and WAM B). The second conference was held on September 10, 2021, and the results of all emission reduction scenarios were presented, including the WAM C scenario, which has offered options to address the remaining hotspots with air quality issues, along with health benefits and appropriate investments and cost-effectiveness analysis. Also, the public concerned could participate in the process of multi-criteria analysis of three scenarios with additional measures (WAM A, WAM B and WAM C) developed for the draft Programme through a Questionnaire available on the "EU for Better Environment" project website. The public was invited to make a contribution in this phase of the development of the Programme as well they and send proposals and questions by September 27, 2021.

The third conference was held on October 29, 2021, at which the Draft Programme was presented to the public together with the Action Plan (Public consultations on the Draft Programme of Air Protection in the Republic of Serbia for the period 2022–2030 with the Action Plan). The deadline for submission of comments, remarks and suggestions was November 8, 2021.

Also, the informal Green Parliamentary Group (GPG) held a cross-sectoral meeting with representatives of the MEP and representatives of the "EU for Better Environment" project on June 14, 2021. The topic of the meeting was presentation of the draft Programme, as well as the activities of the MEP in this field.

At its session held on November 17, 2021, the Government Committee on Economy and Finance adopted the Conclusion with the Public Consultation Programme on the Proposed Programme of Air Protection in the Republic of Serbia for the period 2022–2030 with the Action Plan, Number 05: 353-10620/2021. The public consultation was conducted in the period from November 19 to December 8, 2021. The public consultation on the Programme Proposal was organised by the MEP in the form of a presentation and consultations at an expert public consultation held through a video conference on November 29, 2021.

ANNEX 2

INFORMATION ON THE LEGAL FRAMEWORK TO BE ADOPTED OR AMENDED

The following list includes only the changes to the legal framework necessary for the full implementation of this Programme, regardless of the transposition of EU legislation.

- **Directive 2009/125/EC on eco-design was transposed at the end of 2021 through** the Regulation on eco-design of products that affect energy consumption ("Official Gazette of RS", No. 132/21).

  Delegated regulations transposing the product requirements:

- **Delegated Regulation 2015/1189 implementing the Eco-design Directive for solid fuel boilers is to be transposed in the first quarter of 2023**
- **Delegated Regulation 2015/1185 implementing the Eco-design Directive for solid fuel boilers is to be transposed in the second quarter of 2023**

  - As of January 1st, 2025, appliances placed on the market will comply with the limit values set out in Regulations 2015/1185 and 2015/1189.

Regulation on emission limit values for pollutants into the air from stationary sources, except form combustion plants

- Full compliance with the provisions of the Industrial Emissions Directive, Chapter 2 (BAT AELs intermediate level) will be achieved by December 31, 2024, except for plants that require extended implementation periods.

Regulation on the list of industrial plants and activities controlling the emission of volatile organic compounds, on the values of emission of volatile organic compounds at a specific consumption of solvents and the total permitted emissions, as well as on the emission reduction scheme

- Average value between the upper and lower BAT AELs values until December 31, 2024, except for plants that require extended implementation periods.

Regulation on emission limit values for pollutants into the air from combustion plants

- It is assumed that the dates of legislative harmonisation in accordance with Directive (EU) 2015/2193 on the limitation of emissions of certain pollutants into the air from medium combustion plants are the following:
  - January 1, 2025 for existing plants with a nominal heat output of more than 5 MW,
  - January 1, 2030 for abandoning the plants with a nominal heat output equal to or greater than 1 MW, but less than 5 MW.
- Full compliance with the provisions of Chapter 2 of the IED by December 31, 2024, except for plants that require extended implementation periods (average between upper and lower BAT AELs values is being considered).

Regulation on the importation of motor vehicles

- Amendment of minimum requirements for imported cars up to Euro 4, Euro 5 and Euro 6.

Law on tax on usage, possession and carrying of goods ("Official Gazette of the Republic of Serbia", No. 26/01, 80/02, 43/04, 132/04, 112/05, 114/06, 118/07, 114/08, 31/09, 106/09, 95/10, 101/10, 24/11, 100/11, 120/12, 113/13, 68/14, 140/14, 109/15, 112/15, 105/16, 119/17, 104/18, 86/19, 90/19, 156/20, 118/21 and 132/21)

- in part of taxes for the use of motor vehicles till the end of 2024 with the beginning of implementation of the law on January 1, 2028 at the latest, in order to incentivize the use of motor vehicles whose environmental impact is as favourable as possible.

Rulebook on technical measures and requirements relating to the permissible emission factors for VOC, which come from the process of petrol storage and transport.

- The equipping of gas terminals and prospective stations is expected to continue, and the completion is expected on January 31, 2028.

Law on Air Protection

Rulebook on the minimum content of the national air pollution control program

- The following six principles of nitrogen management set out in Annex III, Part 2 of Directive 2284/2016, are also listed in Annex IX of the Gothenburg Protocol, and read as follows:

  i. nitrogen management, taking into account its entire cycle;
  ii. livestock feeding strategies;
  iii. low emission slurry spreading techniques;
  iv. low emission slurry storage systems;
  v. low-emission animal housing systems;
  vi. possibilities for limiting NH3 emissions by using mineral fertilisers,

and they are to be transposed, and the Ministry responsible for agriculture will update the Code of Good agricultural practice in Serbia from 2016 by 2023.

Law on agricultural land

- Chapter X (Supervision) of the Law on agricultural land is to be amended in order to authorise inspectors (Article 83) to impose penalties for violating Article 28 paragraph (2) of the Law on agricultural land which prohibits field burning of agricultural residues after harvest on agricultural land.

ANNEX 3

PRESENTATION OF AIR EMISSIONS SCENARIOS BY SECTORS

This Annex presents detailed data on air pollutants emission projections until 2030 for each pollutant and for each scenario. Emissions of air pollutants are divided by sectors. In the tabular overview of emissions for the years 2005, 2015, 2020, 2025, 2030 and 2035, the percentage values of the reduction of pollutants in the period between 2030 and 2015 and between 2030 and 2005 are also given.

NOx emissions

Scenario WEM	2005	2015	2020	2025	2030	2035	2030/2015	2030/2005
A_Electric energy, public	74.5	72.5	73.7	21.1	18.1	15.2	-75,1%	-75,8%
B_Industry	17.2	16.4	17.1	13.5	12.6	12.3	-23,0%	-26,9%
C_Other stationary sources	6.0	4.9	4.4	3.8	3.6	3.4	-26,3%	-39,8%
D_Inadvertent	0.7	0.0	0.0	0.0	0.0	0.0	5,6%	-99,9%
E_Solvents	0.0	0.1	0.1	0.1	0.1	0.1	20,8%	132,7%
F_Road traffic	44.8	36.5	31.1	27.0	24.7	20.7	-32,2%	-44,9%
G_Water transport	1.3	0.7	0.8	0.9	1.1	1.2	49,3%	-21,0%
H_Air transport	0.3	0.5	0.5	0.5	0.6	0.6	20,1%	80,7%
I_NRMM	10.6	5.7	5.2	5.3	4.6	4.3	-18,2%	-56,2%
J_Waste	0.0	0.0	0.0	0.0	0.0	0.0	13,3%	30,5%
K_Stockfarming	0.2	0.3	0.3	0.3	0.3	0.3	-8,7%	26,2%
L_Other agriculture	10.5	6.7	6.7	6.6	6.5	6.4	-3,9%	-38,5%
Total	**166.3**	**144.1**	**140.0**	**79.1**	**72.0**	**64.4**	**-50,0%**	**-56,7%**

NOx emissions

Scenario WAM_A	2005	2015	2020	2025	2030	2035	2030/2015	2030/2005
A_Electric energy, public	74.5	72.5	73.7	20.9	17.9	15.1	-75,3%	-75,9%
B_Industry	17.2	16.4	17.1	13.3	11.7	11.3	-28,7%	-32,3%
C_Other stationary sources	6.0	4.9	4.4	3.6	3.7	3.9	-23,5%	-37,5%
D_Inadvertent	0.7	0.0	0.0	0.0	0.0	0.0	5,6%	-99,9%
E_Solvents	0.0	0.1	0.1	0.1	0.1	0.1	20,8%	132,7%
F_Road traffic	44.8	36.5	31.1	25.2	20.1	16.6	-45,0%	-55,3%
G_Water transport	1.3	0.7	0.8	0.9	1.1	1.2	49,3%	-21,0%
H_Air transport	0.3	0.5	0.5	0.5	0.6	0.6	20,1%	80,7%
I_NRMM	10.6	5.7	5.2	5.1	3.5	2.5	-37,3%	-66,5%
J_Waste	0.0	0.0	0.0	0.0	0.0	0.0	13,3%	30,5%
K_Stockfarming	0.2	0.3	0.3	0.3	0.3	0.3	-8,7%	26,2%
L_Other agriculture	10.5	6.7	6.7	6.6	6.5	6.4	-3,9%	-38,5%

Total	**166.3**	**144.1**	**140.0**	**76.5**	**65.4**	**58.0**	**-54,6%**	**-60,7%**

NOx emissions

Scenario WAM_B	2005	2015	2020	2025	2030	2035	2030/2015	2030/2005
A_Electric energy, public	74.5	72.5	73.7	20.5	17.5	14.4	-75,8%	-76,5%
B_Industry	17.2	16.4	17.1	12.8	9.9	9.5	-39,2%	-42,3%
C_Other stationary sources	6.0	4.9	4.4	3.6	4.1	4.3	-15,5%	-30,9%
D_Inadvertent	0.7	0.0	0.0	0.0	0.0	0.0	5,6%	-99,9%
E_Solvents	0.0	0.1	0.1	0.1	0.1	0.1	20,8%	132,7%
F_Road traffic	44.8	36.5	31.1	23.1	15.8	15.9	-56,5%	-64,7%
G_Water transport	1.3	0.7	0.8	0.9	1.1	1.2	49,3%	-21,0%
H_Air transport	0.3	0.5	0.5	0.5	0.6	0.6	20,1%	80,7%
I_NRMM	10.6	5.7	5.2	5.1	3.5	2.5	-37,3%	-66,5%
J_Waste	0.0	0.0	0.0	0.0	0.0	0.0	13,3%	30,5%
K_Stockfarming	0.2	0.3	0.3	0.3	0.3	0.3	-8,7%	26,2%
L_Other agriculture	10.5	6.7	6.7	5.8	4.8	3.8	-28,6%	-54,3%
Total	**166.3**	**144.1**	**140.0**	**72.6**	**57.8**	**52.6**	**-59,9%**	**-65,3%**

NOx emissions

Scenario WAM C	2005	2015	2020	2025	2030	2035	2030/2015	2030/2005
A_Electric energy, public	74.5	72.5	73.7	20.5	17.5	14.4	-75,8%	-76,5%
B_Industry	17.2	16.4	17.1	12.8	9.9	9.5	-39,2%	-42,3%
C_Other stationary sources	6.0	4.9	4.4	3.5	3.9	4.0	-20,0%	-34,6%
D_Inadvertent	0.7	0.0	0.0	0.0	0.0	0.0	5,6%	-99,9%
E_Solvents	0.0	0.1	0.1	0.1	0.1	0.1	20,8%	132,7%
F_Road traffic	44.8	36.5	31.1	23.1	15.8	15.9	-56,5%	-64,7%
G_Water transport	1.3	0.7	0.8	0.9	1.1	1.2	49,3%	-21,0%
H_Air transport	0.3	0.5	0.5	0.5	0.6	0.6	20,1%	80,7%
I_NRMM	10.6	5.7	5.2	5.1	3.5	2.5	-37,3%	-66,5%
J_Waste	0.0	0.0	0.0	0.0	0.0	0.0	13,3%	30,5%
K_Stockfarming	0.2	0.3	0.3	0.3	0.3	0.3	-8,7%	26,2%
L_Other agriculture	10.5	6.7	6.7	5.4	4.0	3.8	-40,9%	-62,2%
Total	**166.3**	**144.1**	**140.0**	**72.1**	**56.7**	**52.3**	**-60,6%**	**-65,9%**

SO_2 emissions

Scenario WEM	2005	2015	2020	2025	2030	2035	2030/2015	2030/2005
A_Electric energy, public	394.3	330.9	333.5	21.3	19.3	11.9	-94,2%	-95,1%
B_Industry	26.1	25.4	27.5	17.3	15.5	14.2	-39,2%	-40,8%
C_Other stationary sources	20.2	9.0	4.3	3.5	3.0	2.4	-67,3%	-85,4%
D_Inadvertent	1.9	0.0	0.0	0.0	0.0	0.0	4,6%	-100,0%

E_Solvents	-	-	-	-	-	-	-	-
F_Road traffic	1.7	0.0	0.0	0.0	0.1	0.0	31,0%	-97,0%
G_Water transport	0.3	0.2	0.2	0.2	0.3	0.3	49,3%	-21,0%
H_Air transport	0.0	0.0	0.0	0.1	0.1	0.1	20,1%	80,7%
I_NRMM	0.0	0.0	0.0	0.0	0.0	0.0	-24,6%	99,6%
J_Waste	0.0	0.0	0.0	0.0	0.0	0.0	13,3%	30,5%
K_Stockfarming	-	-	-	-	-	-	-	-
L_Other agriculture	0.1	0.3	0.3	0.3	0.3	0.4	5,7%	129,0%
Total	**444.8**	**366.0**	**366.0**	**42.9**	**38.4**	**29.3**	**-89,5%**	**-91,4%**

SO_2

Scenario WAM_A	2005	2015	2020	2025	2030	2035	2030/2015	2030/2005
A_Electric energy, public	394.3	330.9	333.5	21.1	19.0	11.7	-94,2%	-95,2%
B_Industry	26.1	25.4	27.5	11.7	9.5	8.7	-62,7%	-63,7%
C_Other stationary sources	20.2	9.0	4.3	3.1	2.4	2.0	-72,9%	-87,9%
D_Inadvertent	1.9	0.0	0.0	0.0	0.0	0.0	4,6%	-100,0%
E_Solvents	-	-	-	-	-	-	-	-
F_Road traffic	1.7	0.0	0.0	0.0	0.0	0.0	25,6%	-97,1%
G_Water transport	0.3	0.2	0.2	0.1	0.1	0.2	-25,3%	-60,5%
H_Air transport	0.0	0.0	0.0	0.1	0.1	0.1	20,1%	80,7%
I_NRMM	0.0	0.0	0.0	0.0	0.0	0.0	-90,5%	-74,8%
J_Waste	0.0	0.0	0.0	0.0	0.0	0.0	13,3%	30,5%
K_Stockfarming	-	-	-	-	-	-	-	-
L_Other agriculture	0.1	0.3	0.3	0.3	0.3	0.4	5,7%	129,0%
Total	**444.8**	**366.0**	**366.0**	**36.4**	**31.5**	**23.0**	**-91,4%**	**-92,9%**

SO_2

Scenario WAM_B	2005	2015	2020	2025	2030	2035	2030/2015	2030/2005
A_Electric energy, public	394.3	330.9	333.5	20.8	18.8	11.6	-94,3%	-95,2%
B_Industry	26.1	25.4	27.5	10.5	8.2	7.4	-67,9%	-68,8%
C_Other stationary sources	20.2	9.0	4.3	3.1	2.4	2.0	-72,9%	-87,9%
D_Inadvertent	1.9	0.0	0.0	0.0	0.0	0.0	4,6%	-100,0%
E_Solvents	-	-	-	-	-	-	-	-
F_Road traffic	1.7	0.0	0.0	0.0	0.0	0.0	23,8%	-97,2%
G_Water transport	0.3	0.2	0.2	0.1	0.1	0.2	-25,3%	-60,5%
H_Air transport	0.0	0.0	0.0	0.1	0.1	0.1	20,1%	80,7%
I_NRMM	0.0	0.0	0.0	0.0	0.0	0.0	-90,5%	-74,8%
J_Waste	0.0	0.0	0.0	0.0	0.0	0.0	13,3%	30,5%
K_Stockfarming	-	-	-	-	-	-	-	-
L_Other agriculture	0.1	0.3	0.3	0.2	0.1	-	-64,8%	-23,7%
Total	**444.8**	**366.0**	**366.0**	**34.9**	**29.8**	**21.2**	**-91,9%**	**-93,3%**

SO_2

Scenario WAM_C	2005	2015	2020	2025	2030	2035	2030/2015	2030/2005
A_Electric energy, public	394.3	330.9	333.5	20.8	18.8	11.6	-94,3%	-95,2%
B_Industry	26.1	25.4	27.5	10.1	7.8	7.1	-69,1%	-70,0%
C_Other stationary sources	20.2	9.0	4.3	3.1	2.4	1.9	-73,5%	-88,1%
D_Inadvertent	1.9	0.0	0.0	0.0	0.0	0.0	4,6%	-100,0%
E_Solvents	-	-	-	-	-	-	-	-
F_Road traffic	1.7	0.0	0.0	0.0	0.0	0.0	23,8%	-97,2%
G_Water transport	0.3	0.2	0.2	0.1	0.1	0.2	-25,3%	-60,5%
H_Air transport	0.0	0.0	0.0	0.1	0.1	0.1	20,1%	80,7%
I_NRMM	0.0	0.0	0.0	0.0	0.0	0.0	-90,5%	-74,8%
J_Waste	0.0	0.0	0.0	0.0	0.0	0.0	13,3%	30,5%
K_Stockfarming	-	-	-	-	-	-	-	-
L_Other agriculture	0.1	0.3	0.3	0.2	-	-	-100,0%	-100,0%
Total	**444.8**	**366.0**	**366.0**	**34.4**	**29.3**	**20.8**	**-92,0%**	**-93,4%**

PM_{10} emissions

Scenario WEM	2005	2015	2020	2025	2030	2035	2030/2015	2030/2005
A_Electric energy, public	2.6	12.1	12.2	4.7	2.9	1.4	-75,6%	14,0%
B_Industry	6.4	8.2	9.3	5.5	6.0	6.5	-26,8%	-6,3%
C_Other stationary sources	32.6	35.9	36.9	36.0	34.6	34.5	-3,6%	6,1%
D_Inadvertent	1.7	1.7	1.7	1.6	1.4	1.0	-16,2%	-15,8%
E_Solvents	0.8	1.1	1.5	1.5	1.5	1.5	30,5%	97,5%
F_Road traffic	2.5	2.8	2.6	2.4	2.2	2.1	-21,7%	-11,6%
G_Water transport	0.1	0.1	0.1	0.1	0.1	0.1	49,3%	-21,0%
H_Air transport	0.0	0.0	0.0	0.0	0.0	0.0	20,1%	80,7%
I_NRMM	0.1	0.3	0.3	0.3	0.2	0.2	-21,4%	311,3%
J_Waste	0.0	0.0	0.0	0.0	0.0	0.0	13,3%	30,5%
K_Stockfarming	2.0	1.6	1.6	1.6	1.6	1.5	-2,9%	-20,0%
L_Other agriculture	7.3	13.0	13.4	13.4	13.4	13.9	2,7%	82,9%
Total	**56.0**	**76.9**	**79.5**	**66.9**	**64.0**	**62.8**	**-16,8%**	**14,2%**

PM_{10}

Scenario WAM_A	2005	2015	2020	2025	2030	2035	2030/2015	2030/2005
A_Electric energy, public	2.6	12.1	12.2	4.6	2.9	1.3	-76,3%	10,9%
B_Industry	6.4	8.2	9.3	4.9	4.9	5.4	-40,1%	-23,3%
C_Other stationary sources	32.6	35.9	36.9	34.5	26.3	19.3	-26,9%	-19,5%
D_Inadvertent	1.7	1.7	1.7	1.6	1.5	1.0	-13,7%	-13,3%
E_Solvents	0.8	1.1	1.5	1.5	1.5	1.5	30,5%	97,5%
F_Road traffic	2.5	2.8	2.6	2.3	2.1	2.0	-25,5%	-15,8%
G_Water transport	0.1	0.1	0.1	0.1	0.1	0.1	49,3%	-21,0%
H_Air transport	0.0	0.0	0.0	0.0	0.0	0.0	20,1%	80,7%
I_NRMM	0.1	0.3	0.3	0.3	0.2	0.1	-47,5%	174,4%
J_Waste	0.0	0.0	0.0	0.0	0.0	0.0	13,3%	30,5%
K_Stockfarming	2.0	1.6	1.6	1.6	1.6	1.5	-2,9%	-20,0%
L_Other agriculture	7.3	13.0	13.4	13.4	13.4	13.9	2,7%	82,9%
Total	**56.0**	**76.9**	**79.5**	**64.7**	**54.3**	**46.1**	**-29,4%**	**-3,1%**

PM_{10}

Scenario WAM_B	2005	2015	2020	2025	2030	2035	2030/2015	2030/2005
A_Electric energy, public	2.6	12.1	12.2	4.6	2.8	1.3	-76,5%	9,8%
B_Industry	6.4	8.2	9.3	4.8	4.6	5.1	-43,6%	-27,8%
C_Other stationary sources	32.6	35.9	36.9	34.5	19.3	12.3	-46,2%	-40,7%
D_Inadvertent	1.7	1.7	1.7	1.6	1.5	1.0	-13,5%	-13,2%
E_Solvents	0.8	1.1	1.5	1.5	1.5	1.5	30,5%	97,5%
F_Road traffic	2.5	2.8	2.6	2.2	2.0	2.0	-27,6%	-18,2%
G_Water transport	0.1	0.1	0.1	0.1	0.1	0.1	49,3%	-21,0%
H_Air transport	0.0	0.0	0.0	0.0	0.0	0.0	20,1%	80,7%
I_NRMM	0.1	0.3	0.3	0.3	0.2	0.1	-47,5%	174,4%
J_Waste	0.0	0.0	0.0	0.0	0.0	0.0	13,3%	30,5%
K_Stockfarming	2.0	1.6	1.6	1.6	1.6	1.5	-2,9%	-20,0%
L_Other agriculture	7.3	13.0	13.4	10.7	8.0	5.6	-38,3%	9,8%
Total	**56.0**	**76.9**	**79.5**	**61.8**	**41.7**	**30.5**	**-45,8%**	**-25,6%**

PM_{10}

Scenario WAM_C	2005	2015	2020	2025	2030	2035	2030/2015	2030/2005
A_Electric energy, public	2.6	12.1	12.2	4.6	2.8	1.3	-76,5%	9,8%
B_Industry	6.4	8.2	9.3	4.8	4.6	5.1	-43,6%	-27,8%
C_Other stationary sources	32.6	35.9	36.9	34.2	18.1	10.8	-49,7%	-44,6%
D_Inadvertent	1.7	1.7	1.7	1.6	1.5	1.0	-13,5%	-13,2%
E_Solvents	0.8	1.1	1.5	1.5	1.5	1.5	30,5%	97,5%
F_Road traffic	2.5	2.8	2.6	2.2	2.0	2.0	-27,6%	-18,2%
G_Water transport	0.1	0.1	0.1	0.1	0.1	0.1	49,3%	-21,0%
H_Air transport	0.0	0.0	0.0	0.0	0.0	0.0	20,1%	80,7%
I_NRMM	0.1	0.3	0.3	0.3	0.2	0.1	-47,5%	174,4%
J_Waste	0.0	0.0	0.0	0.0	0.0	0.0	13,3%	30,5%
K_Stockfarming	2.0	1.6	1.6	1.6	1.6	1.5	-2,9%	-20,0%
L_Other agriculture	7.3	13.0	13.4	9.4	5.4	5.6	-58,8%	-26,7%
Total	**56.0**	**76.9**	**79.5**	**60.1**	**37.7**	**29.0**	**-50,9%**	**-32,6%**

$PM_{2.5}$ emissions

Scenario WEM	2005	2015	2020	2025	2030	2035	2030/2015	2030/2005
A_Electric energy, public	1.2	5.0	5.0	1.9	1.2	0.7	-75,1%	6,3%
B_Industry	3.0	4.2	4.8	2.0	2.1	2.1	-50,8%	-29,8%
C_Other stationary sources	31.8	35.0	35.9	35.1	33.7	33.6	-3,7%	6,0%
D_Inadvertent	0.3	0.2	0.2	0.2	0.1	0.1	-48,0%	-55,3%
E_Solvents	0.7	1.1	1.4	1.4	1.4	1.4	27,8%	105,8%
F_Road traffic	2.0	2.1	1.8	1.5	1.4	1.2	-36,2%	-32,5%
G_Water transport	0.1	0.1	0.1	0.1	0.1	0.1	49,3%	-21,0%
H_Air transport	0.0	0.0	0.0	0.0	0.0	0.0	20,1%	80,7%
I_NRMM	0.1	0.3	0.3	0.3	0.2	0.2	-21,5%	316,3%
J_Waste	0.0	0.0	0.0	0.0	0.0	0.0	13,3%	30,5%
K_Stockfarming	0.5	0.3	0.3	0.3	0.3	0.3	-14,5%	-42,5%
L_Other agriculture	1.8	7.5	7.9	7.9	7.9	8.2	5,2%	338,0%
Total	**41.3**	**55.8**	**57.7**	**50.6**	**48.4**	**47.9**	**-13,3%**	**17,1%**

$PM_{2.5}$

Scenario WAM_A	2005	2015	2020	2025	2030	2035	2030/2015	2030/2005
A_Electric energy, public	1.2	5.0	5.0	1.9	1.2	0.6	-76,0%	2,4%
B_Industry	3.0	4.2	4.8	1.5	1.2	1.3	-70,8%	-58,2%
C_Other stationary sources	31.8	35.0	35.9	33.6	25.6	18.7	-27,0%	-19,6%
D_Inadvertent	0.3	0.2	0.2	0.2	0.2	0.1	-13,1%	-25,3%
E_Solvents	0.7	1.1	1.4	1.4	1.4	1.4	27,8%	105,8%
F_Road traffic	2.0	2.1	1.8	1.5	1.3	1.2	-41,2%	-37,8%
G_Water transport	0.1	0.1	0.1	0.1	0.1	0.1	49,3%	-21,0%
H_Air transport	0.0	0.0	0.0	0.0	0.0	0.0	20,1%	80,7%
I_NRMM	0.1	0.3	0.3	0.3	0.2	0.1	-47,8%	177,1%
J_Waste	0.0	0.0	0.0	0.0	0.0	0.0	13,3%	30,5%
K_Stockfarming	0.5	0.3	0.3	0.3	0.3	0.3	-14,5%	-42,5%
L_Other agriculture	1.8	7.5	7.9	7.9	7.9	8.2	5,2%	338,0%
Total	**41.3**	**55.8**	**57.7**	**48.7**	**39.2**	**32.0**	**-29,7%**	**-5,0%**

$PM_{2.5}$

Scenario WAM_B	2005	2015	2020	2025	2030	2035	2030/2015	2030/2005
A_Electric energy, public	1.2	5.0	5.0	1.9	1.2	0.6	-76,2%	1,4%
B_Industry	3.0	4.2	4.8	1.5	1.0	1.1	-75,4%	-64,9%
C_Other stationary sources	31.8	35.0	35.9	33.6	18.8	12.0	-46,2%	-40,8%
D_Inadvertent	0.3	0.2	0.2	0.2	0.2	0.1	-11,0%	-23,6%
E_Solvents	0.7	1.1	1.4	1.4	1.4	1.4	27,8%	105,8%
F_Road traffic	2.0	2.1	1.8	1.4	1.2	1.2	-44,0%	-40,8%
G_Water transport	0.1	0.1	0.1	0.1	0.1	0.1	49,3%	-21,0%
H_Air transport	0.0	0.0	0.0	0.0	0.0	0.0	20,1%	80,7%
I_NRMM	0.1	0.3	0.3	0.3	0.2	0.1	-47,8%	177,1%
J_Waste	0.0	0.0	0.0	0.0	0.0	0.0	13,3%	30,5%
K_Stockfarming	0.5	0.3	0.3	0.3	0.3	0.3	-14,5%	-42,5%
L_Other agriculture	1.8	7.5	7.9	5.4	2.8	0.2	-63,1%	53,6%
Total	**41.3**	**55.8**	**57.7**	**45.9**	**27.1**	**17.0**	**-51,5%**	**-34,4%**

$PM_{2.5}$

Scenario WAM_C	2005	2015	2020	2025	2030	2035	2030/2015	2030/2005
A_Electric energy, public	1.2	5.0	5.0	1.9	1.2	0.6	-76,2%	1,4%
B_Industry	3.0	4.2	4.8	1.5	1.0	1.1	-75,4%	-64,9%
C_Other stationary sources	31.8	35.0	35.9	33.3	17.6	10.5	-49,7%	-44,6%
D_Inadvertent	0.3	0.2	0.2	0.2	0.2	0.1	-11,0%	-23,6%
E_Solvents	0.7	1.1	1.4	1.4	1.4	1.4	27,8%	105,8%
F_Road traffic	2.0	2.1	1.8	1.4	1.2	1.2	-44,0%	-40,8%
G_Water transport	0.1	0.1	0.1	0.1	0.1	0.1	49,3%	-21,0%
H_Air transport	0.0	0.0	0.0	0.0	0.0	0.0	20,1%	80,7%
I_NRMM	0.1	0.3	0.3	0.3	0.2	0.1	-47,8%	177,1%
J_Waste	0.0	0.0	0.0	0.0	0.0	0.0	13,3%	30,5%
K_Stockfarming	0.5	0.3	0.3	0.3	0.3	0.3	-14,5%	-42,5%
L_Other agriculture	1.8	7.5	7.9	4.1	0.2	0.2	-97,3%	-88,6%
Total	**41.3**	**55.8**	**57.7**	**44.3**	**23.3**	**15.5**	**-58,3%**	**-43,6%**

NMVOC emissions

Scenario WEM	2005	2015	2020	2025	2030	2035	2030/2015	2030/2005
A_Electric energy, public	0.5	0.5	0.5	0.5	0.4	0.5	-4,5%	-7,3%
B_Industry	10.5	10.6	12.1	12.7	14.2	15.8	34,7%	35,7%
C_Other stationary sources	28.3	29.8	29.6	29.0	27.8	27.6	-6,7%	-1,8%
D_Inadvertent	33.9	31.6	30.9	29.9	27.1	19.2	-14,3%	-20,1%
E_Solvents	17.1	19.6	19.6	19.1	18.9	18.7	-3,7%	10,1%
F_Road traffic	30.9	15.6	9.0	6.9	5.9	5.1	-62,2%	-80,9%
G_Water transport	0.0	0.0	0.0	0.0	0.0	0.0	49,3%	-21,0%
H_Air transport	0.0	0.0	0.0	0.0	0.0	0.0	20,1%	80,7%
I_NRMM	1.1	0.7	0.7	0.7	0.6	0.5	-19,9%	-50,1%
J_Waste	0.0	0.0	0.0	0.0	0.0	0.0	21,3%	-21,2%
K_Stockfarming	22.1	15.6	14.7	14.1	13.4	12.6	-14,2%	-39,4%
L_Other agriculture	3.3	7.6	7.9	7.9	7.9	8.2	2,7%	141,7%
Total	**147.8**	**131.7**	**125.0**	**120.7**	**116.2**	**108.3**	**-11,7%**	**-21,4%**

NMVOC

Scenario WAM_A	2005	2015	2020	2025	2030	2035	2030/2015	2030/2005
A_Electric energy, public	0.5	0.5	0.5	0.5	0.4	0.5	-4,5%	-7,3%
B_Industry	10.5	10.6	12.1	12.6	14.2	15.7	34,2%	35,2%
C_Other stationary sources	28.3	29.8	29.6	28.1	22.8	18.5	-23,6%	-19,6%
D_Inadvertent	33.9	31.6	30.9	29.8	26.4	18.6	-16,4%	-22,1%
E_Solvents	17.1	19.6	19.6	17.1	16.9	16.8	-13,7%	-1,3%
F_Road traffic	30.9	15.6	8.9	6.4	5.0	4.4	-68,1%	-83,9%
G_Water transport	0.0	0.0	0.0	0.0	0.0	0.0	49,3%	-21,0%
H_Air transport	0.0	0.0	0.0	0.0	0.0	0.0	20,1%	80,7%
I_NRMM	1.1	0.7	0.7	0.6	0.5	0.4	-34,8%	-59,5%
J_Waste	0.0	0.0	0.0	0.0	0.0	0.0	21,3%	-21,2%
K_Stockfarming	22.1	15.6	14.7	14.1	13.4	12.6	-14,2%	-39,4%
L_Other agriculture	3.3	7.6	7.9	7.9	7.9	8.2	2,7%	141,7%
Total	**147.8**	**131.7**	**124.9**	**117.3**	**107.5**	**95.7**	**-18,4%**	**-27,3%**

NMVOC

Scenario WAM_B	2005	2015	2020	2025	2030	2035	2030/2015	2030/2005
A_Electric energy, public	0.5	0.5	0.5	0.5	0.4	0.5	-4,5%	-7,3%
B_Industry	10.5	10.6	12.1	12.5	14.1	15.6	33,4%	34,4%
C_Other stationary sources	28.3	29.8	29.6	28.1	18.6	14.3	-37,6%	-34,4%
D_Inadvertent	33.9	31.6	30.9	29.8	26.4	18.6	-16,4%	-22,1%
E_Solvents	17.1	19.6	19.6	14.9	14.7	14.6	-24,9%	-14,1%
F_Road traffic	30.9	15.6	8.9	6.3	4.8	4.3	-68,9%	-84,3%
G_Water transport	0.0	0.0	0.0	0.0	0.0	0.0	49,3%	-21,0%
H_Air transport	0.0	0.0	0.0	0.0	0.0	0.0	20,1%	80,7%
I_NRMM	1.1	0.7	0.7	0.6	0.5	0.4	-34,8%	-59,5%
J_Waste	0.0	0.0	0.0	0.0	0.0	0.0	21,3%	-21,2%
K_Stockfarming	22.1	15.6	14.7	14.1	13.4	12.6	-14,2%	-39,4%
L_Other agriculture	3.3	7.6	7.9	6.2	4.6	3.1	-40,0%	41,2%
Total	**147.8**	**131.7**	**124.9**	**113.2**	**97.6**	**84.1**	**-25,8%**	**-33,9%**

NMVOC

Scenario WAM_C	2005	2015	2020	2025	2030	2035	2030/2015	2030/2005
A_Electric energy, public	0.5	0.5	0.5	0.5	0.4	0.5	-4,5%	-7,3%
B_Industry	10.5	10.6	12.1	12.5	14.1	15.6	33,4%	34,4%
C_Other stationary sources	28.3	29.8	29.6	27.8	17.0	12.1	-43,1%	-40,1%
D_Inadvertent	33.9	31.6	30.9	29.8	26.4	18.6	-16,4%	-22,1%
E_Solvents	17.1	19.6	19.6	14.9	14.7	14.6	-24,9%	-14,1%
F_Road traffic	30.9	15.6	8.9	6.3	4.8	4.3	-68,9%	-84,3%
G_Water transport	0.0	0.0	0.0	0.0	0.0	0.0	49,3%	-21,0%
H_Air transport	0.0	0.0	0.0	0.0	0.0	0.0	20,1%	80,7%
I_NRMM	1.1	0.7	0.7	0.6	0.5	0.4	-34,8%	-59,5%
J_Waste	0.0	0.0	0.0	0.0	0.0	0.0	21,3%	-21,2%
K_Stockfarming	22.1	15.6	14.7	14.1	13.4	12.6	-14,2%	-39,4%
L_Other agriculture	3.3	7.6	7.9	5.4	3.0	3.1	-61,4%	-9,1%
Total	**147.8**	**131.7**	**124.9**	**112.1**	**94.4**	**82.0**	**-28,3%**	**-36,2%**

NH_3 emissions

Scenario WEM	2005	2015	2020	2025	2030	2035	2030/2015	2030/2005
A_Electric energy, public	-	-	-	-	-	-	-	-
B_Industry	6.1	3.8	3.3	0.4	0.4	0.4	-89,4%	-93,4%
C_Other stationary sources	2.4	2.5	2.8	2.7	2.6	2.6	4,9%	10,8%
D_Inadvertent	0.0	0.0	0.0	0.0	0.0	0.0	8,6%	-70,5%
E_Solvents	0.1	0.1	0.2	0.2	0.2	0.2	20,7%	128,9%
F_Road traffic	0.2	0.4	0.4	0.3	0.3	0.3	-30,8%	13,3%
G_Water transport	-	-	-	-	-	-	-	-
H_Air transport	-	-	-	-	-	-	-	-
I_NRMM	0.0	0.0	0.0	0.0	0.0	0.0	-21,0%	-35,5%
J_Waste	6.3	4.6	3.9	3.3	2.8	2.3	-40,4%	-55,9%
K_Stockfarming	79.5	33.7	32.4	31.4	30.7	29.4	-8,9%	-61,4%
L_Other agriculture	13.0	38.6	41.3	40.3	42.5	41.2	10,1%	227,6%
Total	**107.5**	**83.8**	**84.3**	**78.6**	**79.4**	**76.3**	**-5,2%**	**-26,1%**

NH_3

Scenario WAM_A	2005	2015	2020	2025	2030	2035	2030/2015	2030/2005
A_Electric energy, public	-	-	-	-	-	-	-	-
B_Industry	6.1	3.8	3.3	0.4	0.4	0.4	-89,6%	-93,5%
C_Other stationary sources	2.4	2.5	2.8	2.7	2.6	2.6	4,9%	10,8%
D_Inadvertent	0.0	0.0	0.0	0.0	0.0	0.0	8,6%	-70,5%
E_Solvents	0.1	0.1	0.2	0.2	0.2	0.2	20,7%	128,9%
F_Road traffic	0.2	0.4	0.4	0.3	0.3	0.2	-34,7%	6,9%
G_Water transport	-	-	-	-	-	-	-	-
H_Air transport	-	-	-	-	-	-	-	-
I_NRMM	0.0	0.0	0.0	0.0	0.0	0.0	-21,0%	-35,5%
J_Waste	6.3	4.6	3.9	3.3	2.8	2.3	-40,4%	-55,9%
K_Stockfarming	79.5	33.7	32.4	31.4	30.7	29.4	-8,9%	-61,4%
L_Other agriculture	13.0	38.6	40.3	38.1	38.8	36.1	0,4%	198,5%
Total	**107.5**	**83.8**	**83.3**	**76.3**	**75.6**	**71.3**	**-9,7%**	**-29,7%**

NH_3

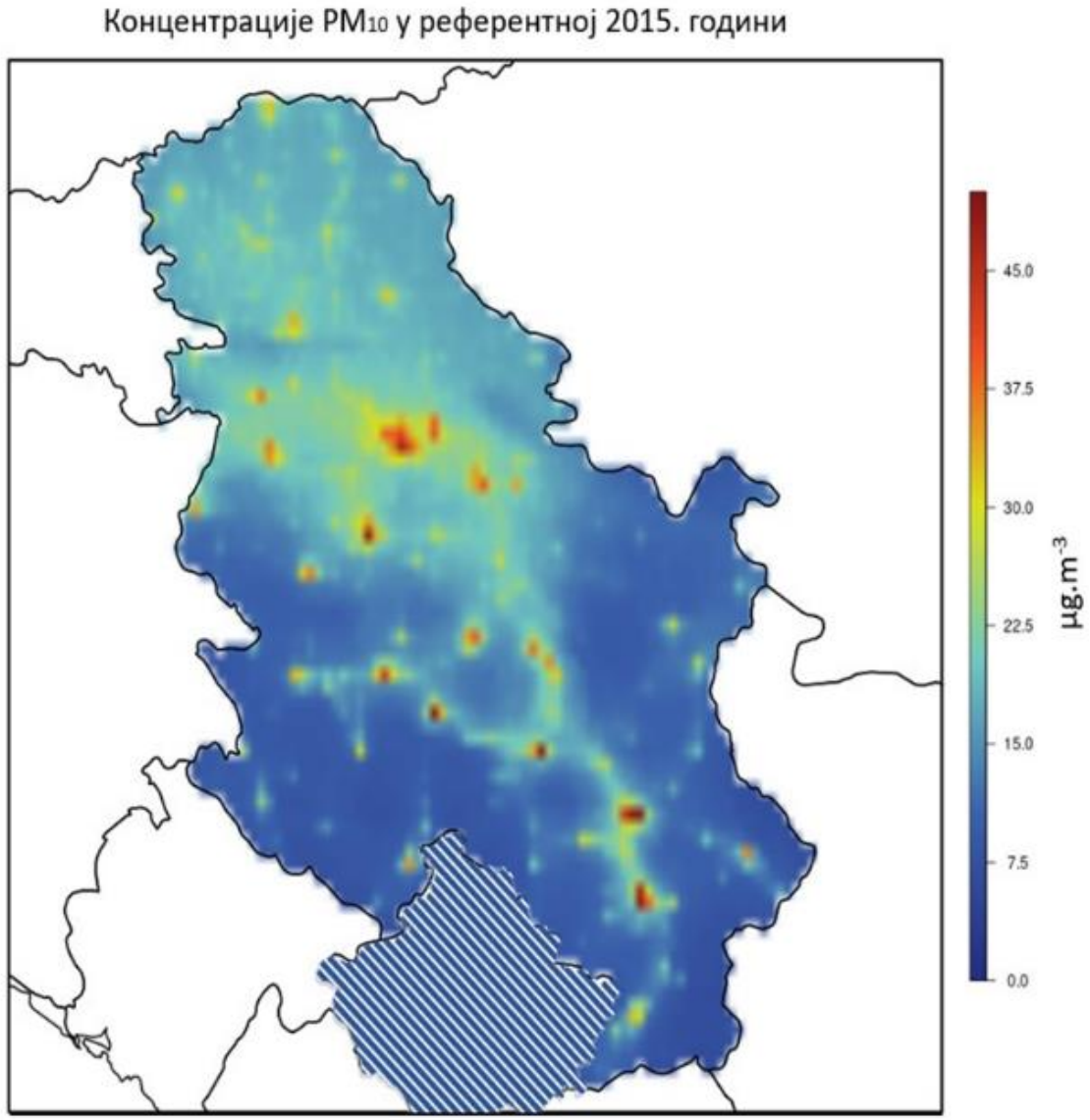
Scenario WAM_B	2005	2015	2020	2025	2030	2035	2030/2015	2030/2005
A_Electric energy, public	-	-	-	-	-	-	-	-
B_Industry	6.1	3.8	3.3	0.4	0.4	0.4	-89,7%	-93,6%
C_Other stationary sources	2.4	2.5	2.8	2.7	2.6	2.6	4,9%	10,8%
D_Inadvertent	0.0	0.0	0.0	0.0	0.0	0.0	8,6%	-70,5%
E_Solvents	0.1	0.1	0.2	0.2	0.2	0.2	20,7%	128,9%
F_Road traffic	0.2	0.4	0.4	0.3	0.3	0.2	-34,5%	7,1%
G_Water transport	-	-	-	-	-	-	-	-
H_Air transport	-	-	-	-	-	-	-	-
I_NRMM	0.0	0.0	0.0	0.0	0.0	0.0	-21,0%	-35,5%
J_Waste	6.3	4.6	3.9	3.3	2.8	2.3	-40,4%	-55,9%
K_Stockfarming	79.5	33.7	32.4	31.4	30.6	29.4	-9,0%	-61,5%
L_Other agriculture	13.0	38.6	37.8	33.8	31.1	27.0	-19,5%	139,5%
Total	**107.5**	**83.8**	**80.7**	**72.0**	**67.9**	**62.0**	**-18,9%**	**-36,8%**

NH_3

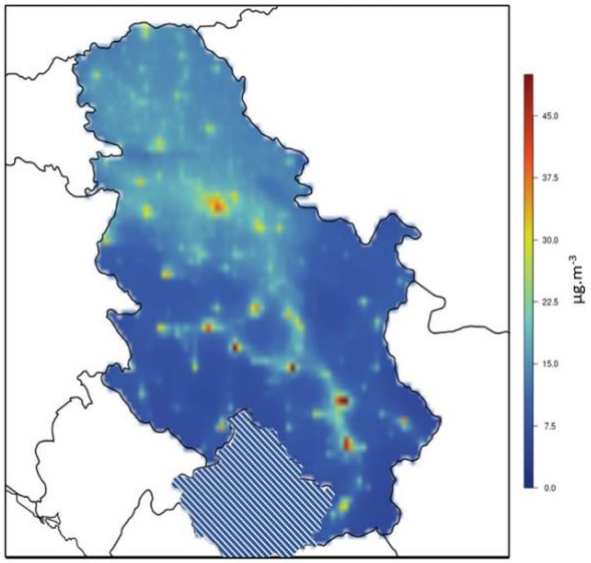
Scenario WAM_C	2005	2015	2020	2025	2030	2035	2030/2015	2030/2005
A_Electric energy, public	-	-	-	-	-	-	-	-
B_Industry	6.1	3.8	3.3	0.4	0.4	0.4	-89,7%	-93,6%
C_Other stationary sources	2.4	2.5	2.8	2.7	2.3	2.2	-7,3%	-2,1%
D_Inadvertent	0.0	0.0	0.0	0.0	0.0	0.0	8,6%	-70,5%
E_Solvents	0.1	0.1	0.2	0.2	0.2	0.2	20,7%	128,9%
F_Road traffic	0.2	0.4	0.4	0.3	0.3	0.2	-34,5%	7,1%
G_Water transport	-	-	-	-	-	-	-	-
H_Air transport	-	-	-	-	-	-	-	-
I_NRMM	0.0	0.0	0.0	0.0	0.0	0.0	-21,0%	-35,5%
J_Waste	6.3	4.6	3.9	3.3	2.8	2.3	-40,4%	-55,9%
K_Stockfarming	79.5	33.7	32.4	31.4	30.6	29.4	-9,0%	-61,5%
L_Other agriculture	13.0	38.6	37.8	33.2	30.1	27.0	-22,2%	131,5%
Total	**107.5**	**83.8**	**80.7**	**71.5**	**66.6**	**61.6**	**-20,5%**	**-38,1%**

ANNEX 4

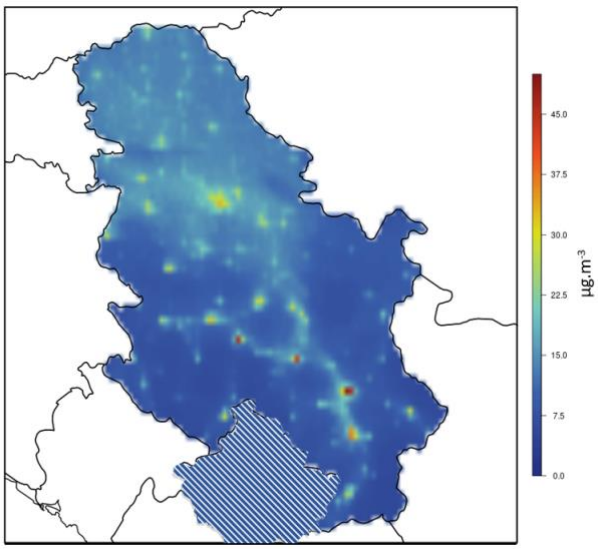
RESULTS OF MODELLING THE SPREAD OF THE IMPACT OF WAM-A, WAM-B AND WAM-C SCENARIOS



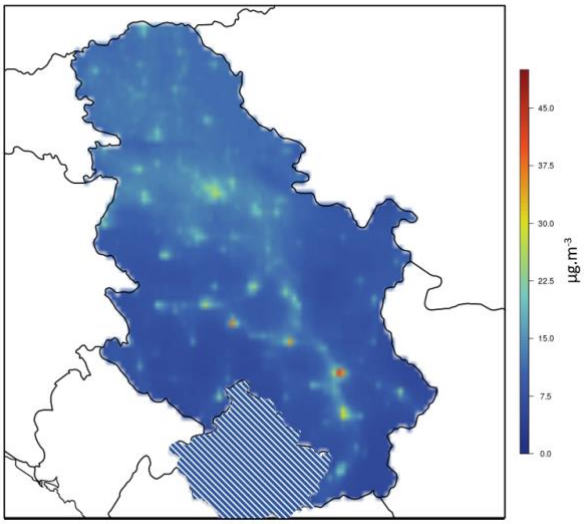
Концентрације PM_{10} 2030. године по сценарију WEM



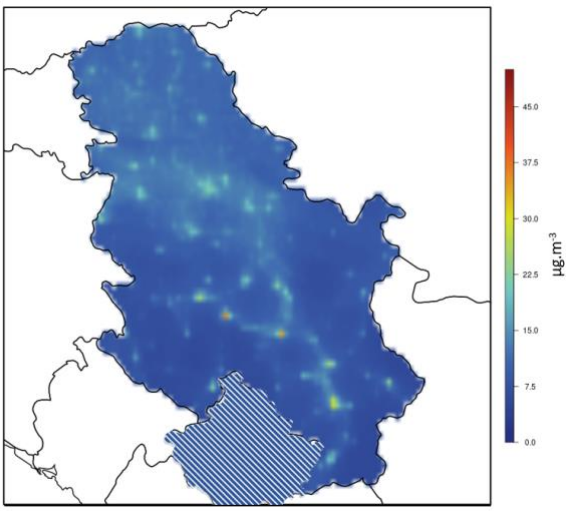
Концентрације PM_{10} 2030. године по сценарију WAM A



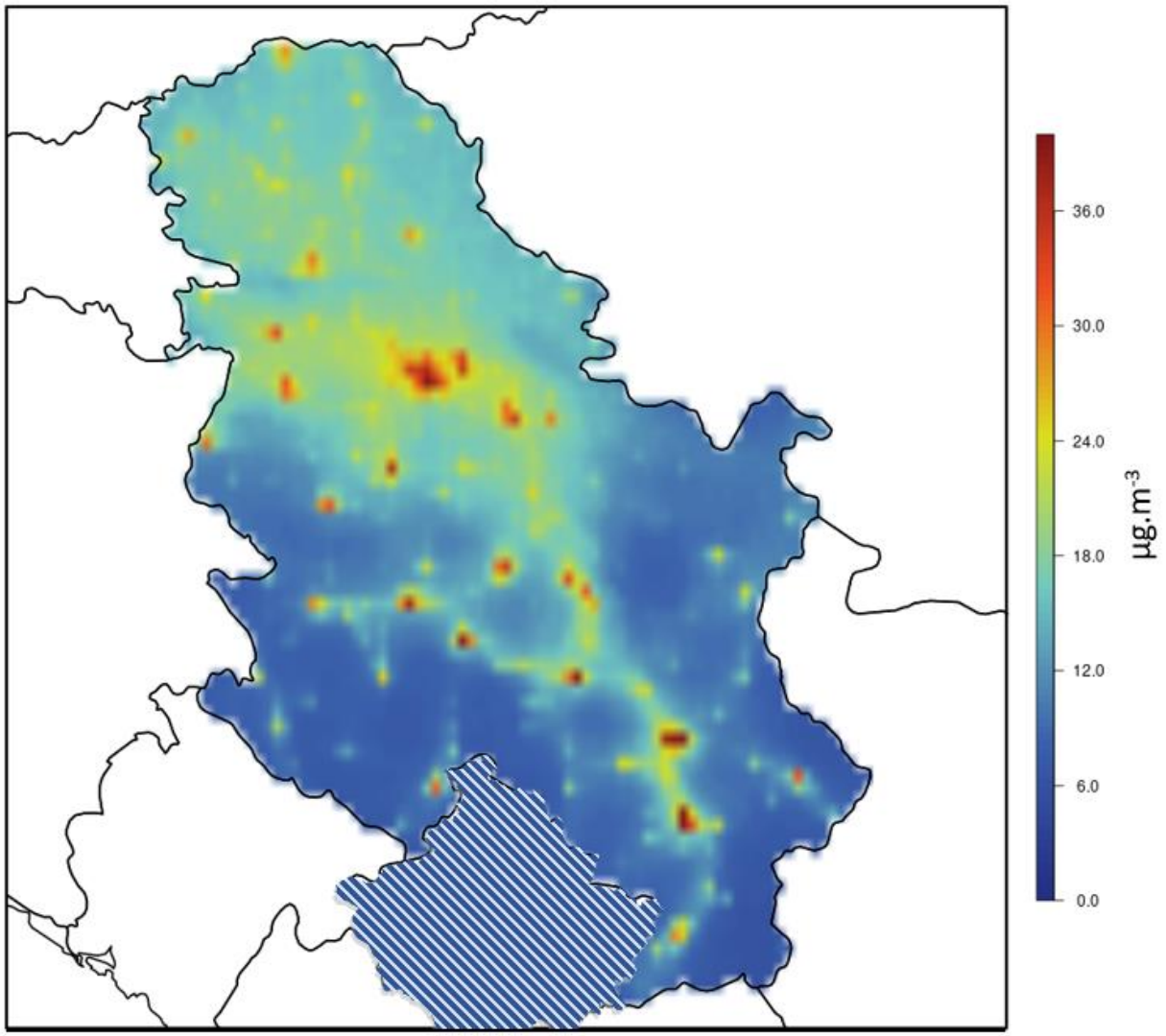
Концентрације PM_{10} 2030. године по сценарију WAM B



Концентрације PM_{10} 2030. године по сценарију WAM C



Концентрације $PM_{2.5}$ у референтној 2015. години



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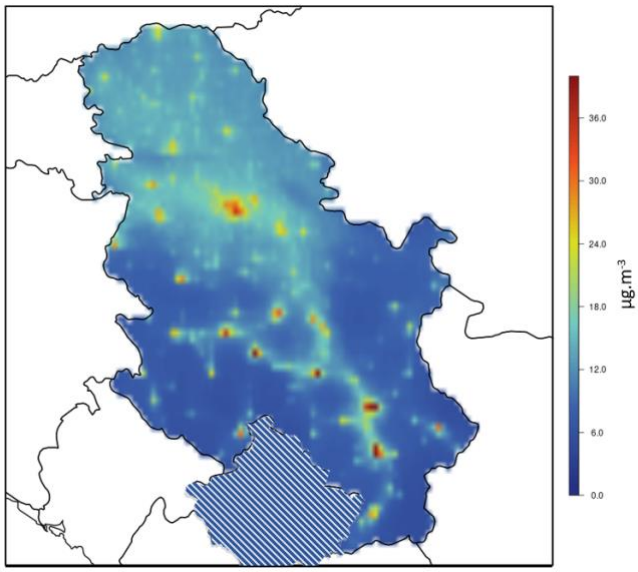

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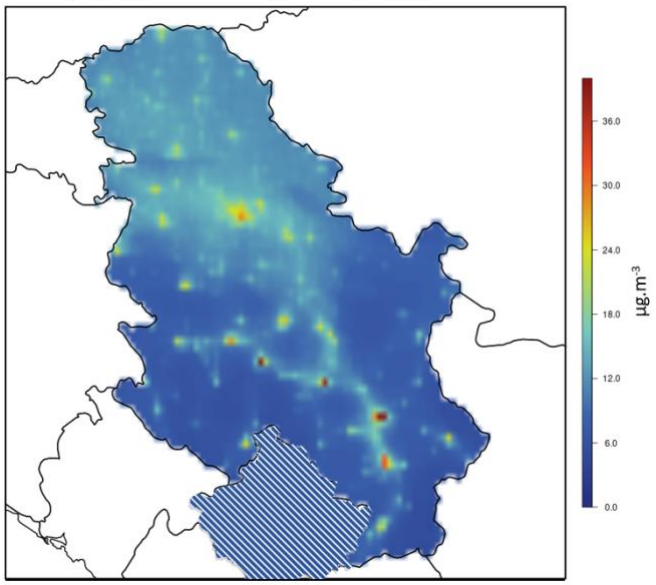

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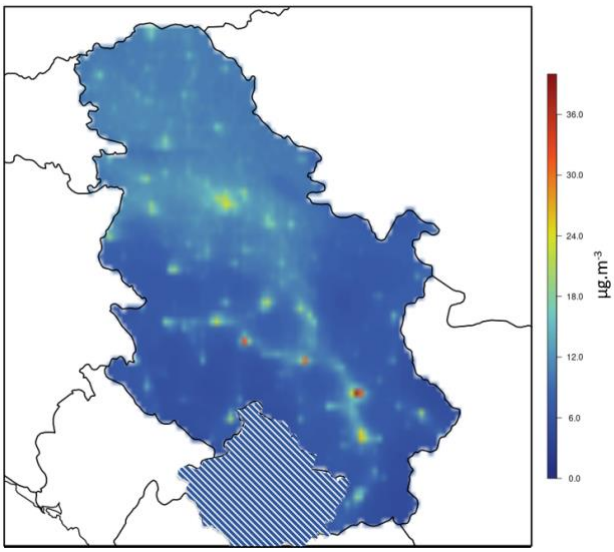

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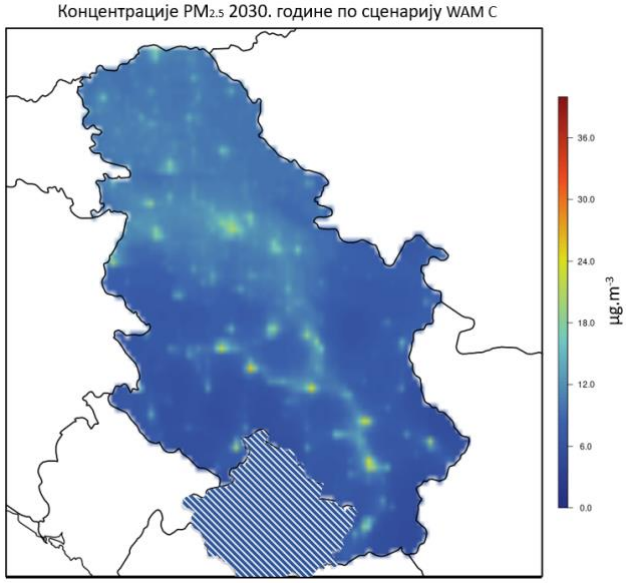
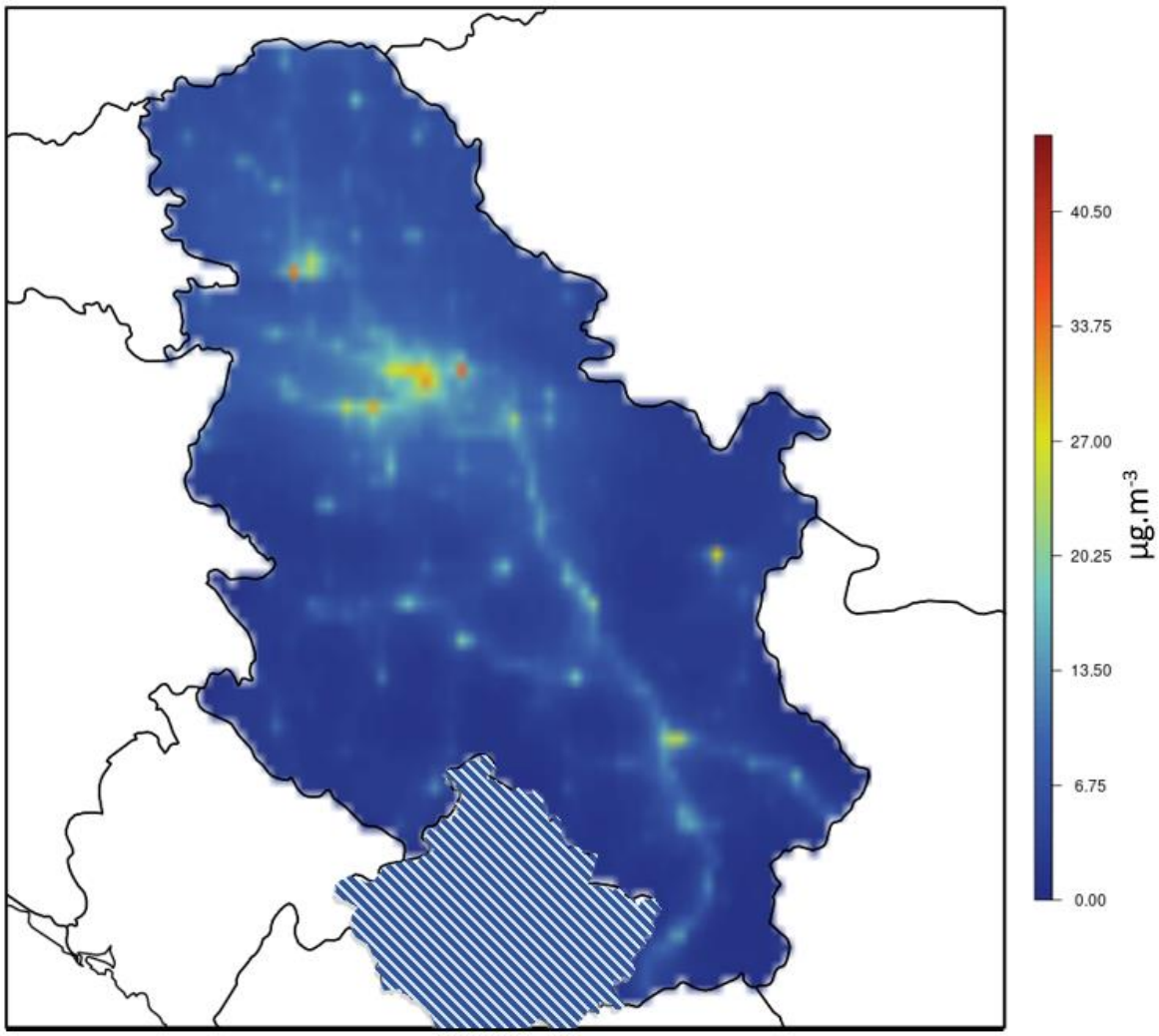
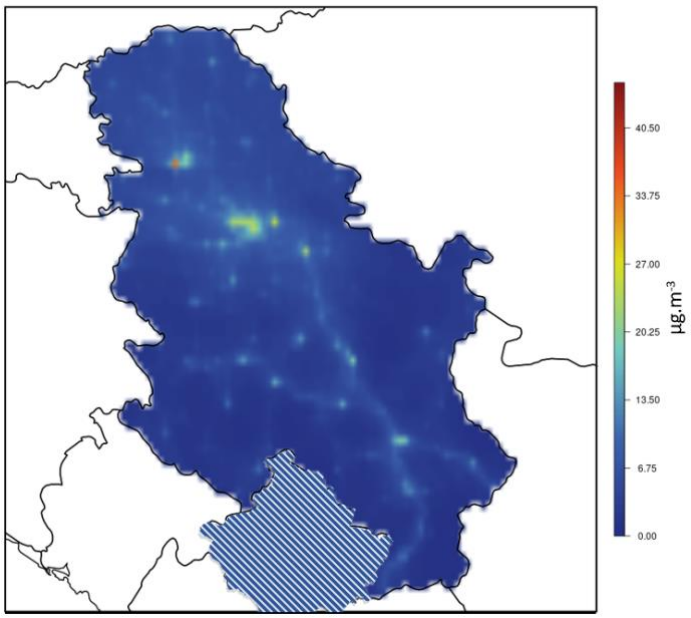


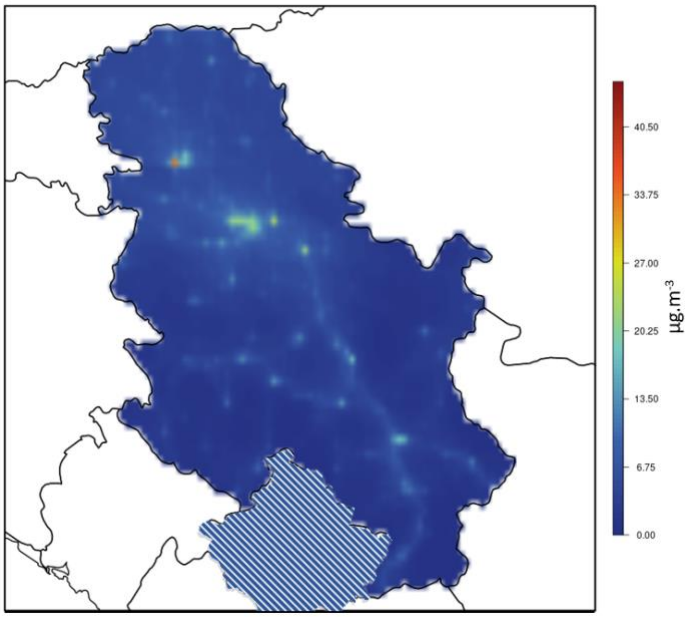
Концентрације NO_2 у референтној 2015. години



Концентрације NO_2 2030. године по сценарију WEM



Концентрације NO_2 2030. године по сценарију WAM A



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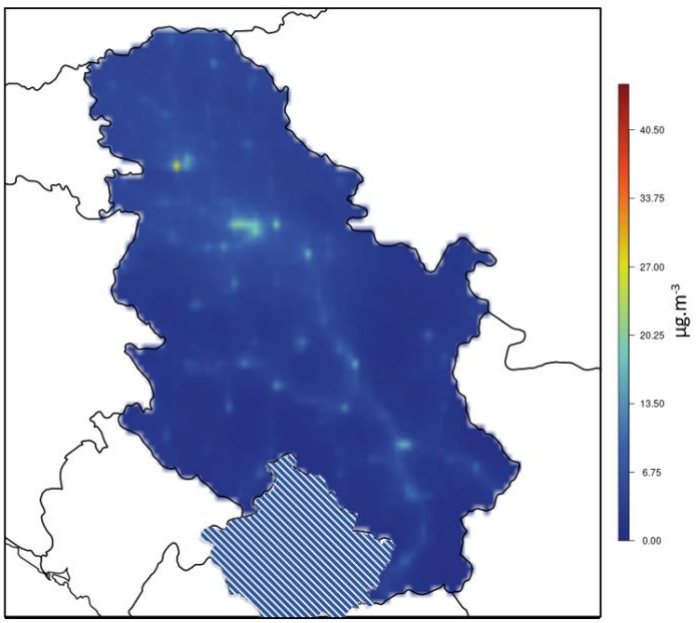
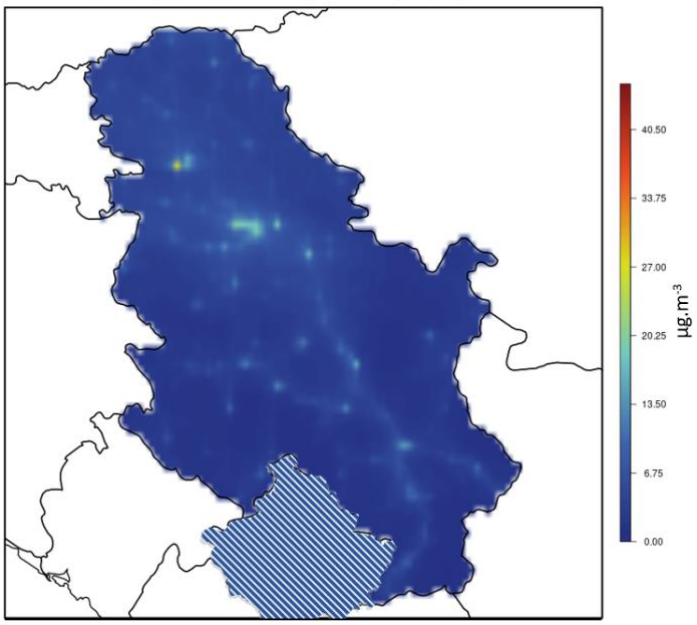
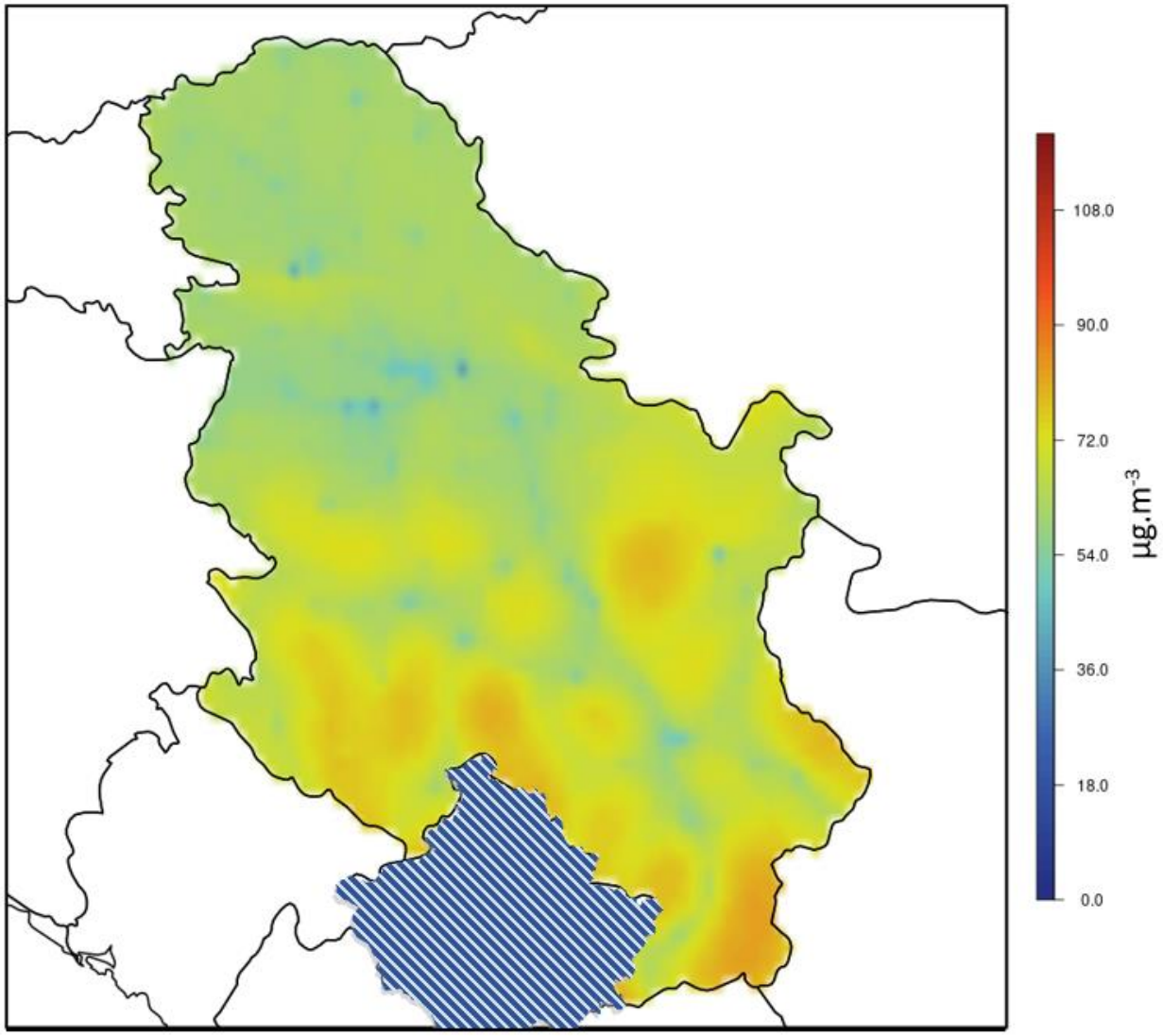


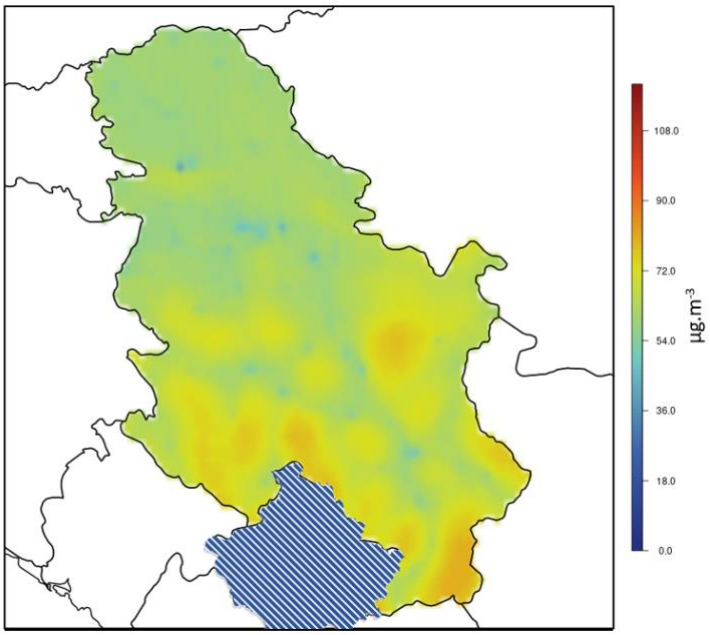
Концентрације NO_2 2030. године по сценарију WAM C



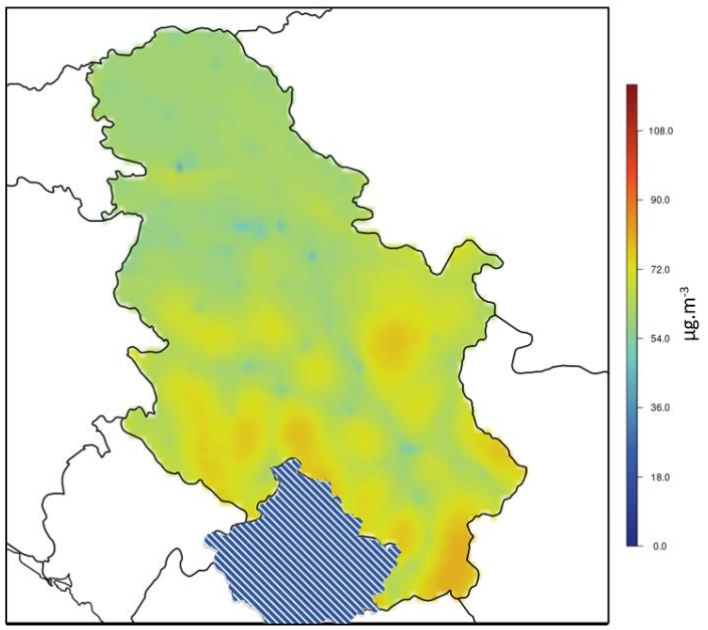
Концентрације O_3 у референтној 2015. години



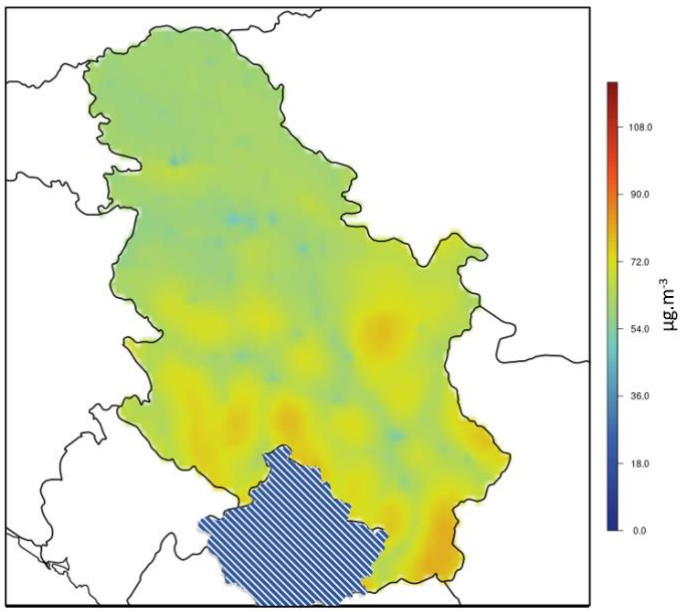
Концентрације O_3 2030. године по сценарију WEM



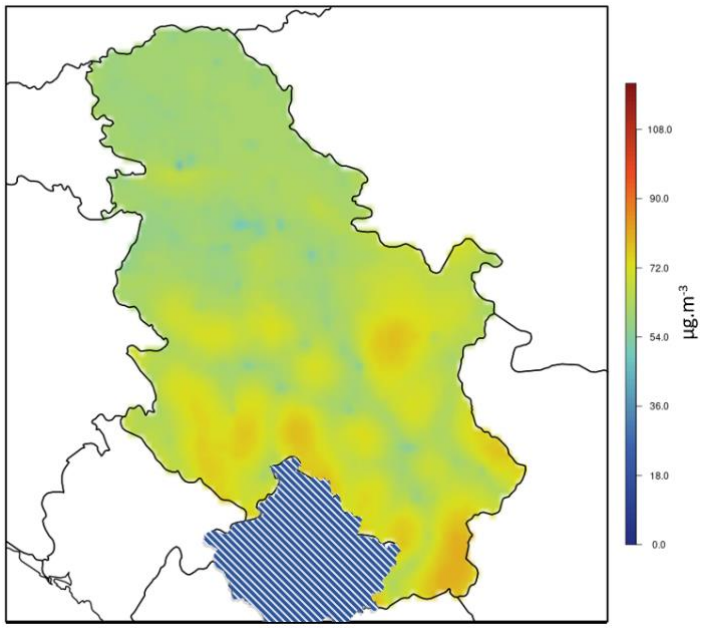
Концентрације O_3 2030. године по сценарију WAM A



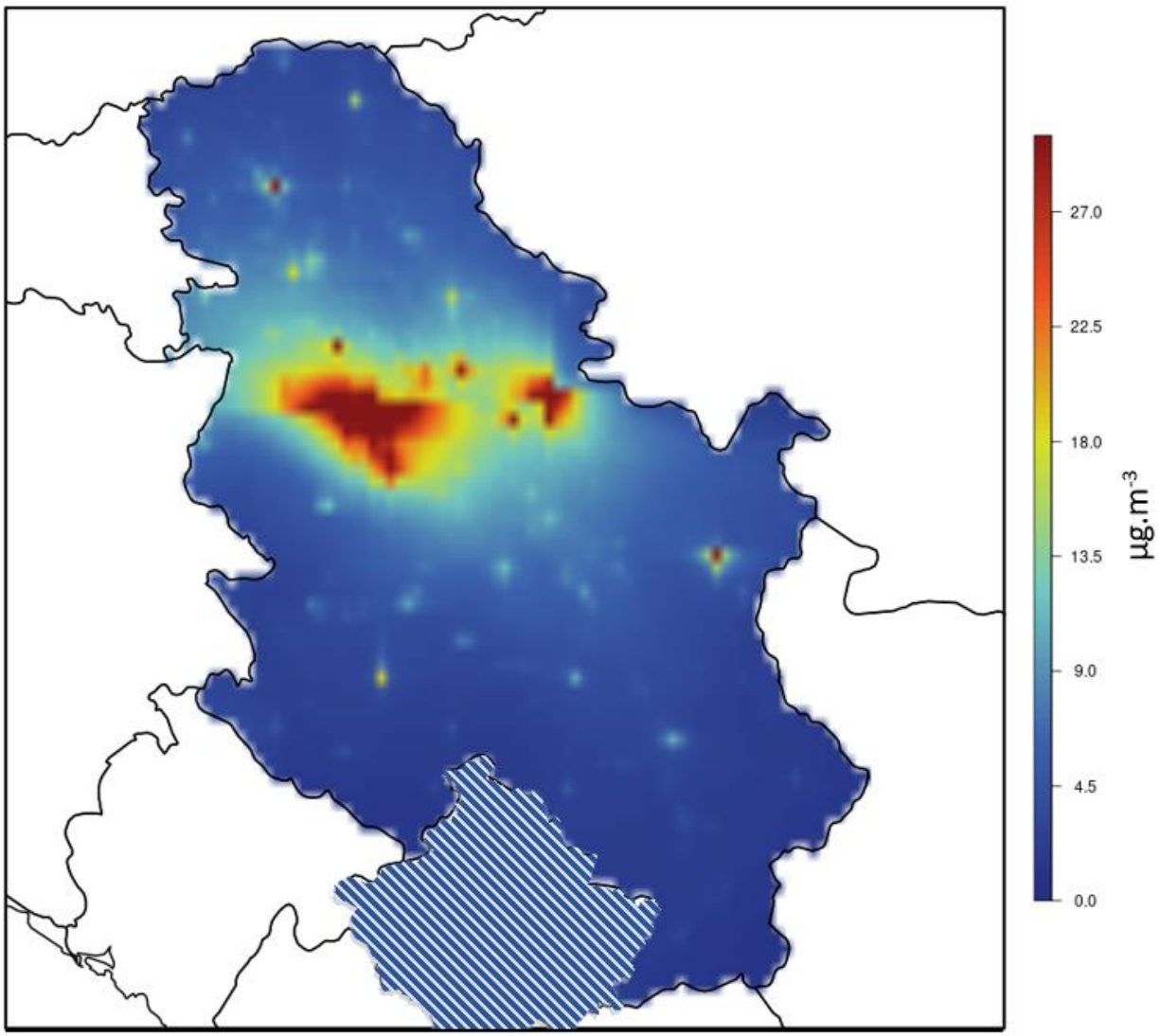
Концентрације O_3 2030. године по сценарију WAM B



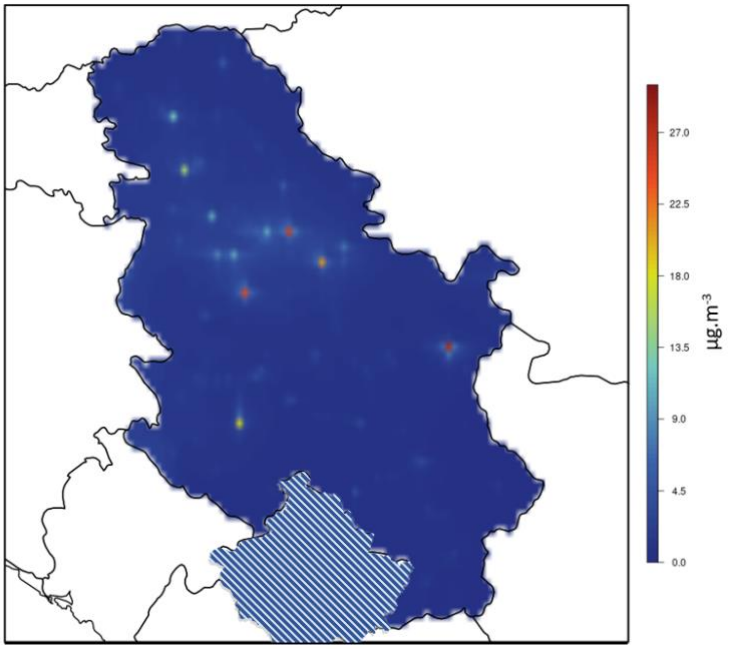
Концентрације O_3 2030. године по сценарију WAM C



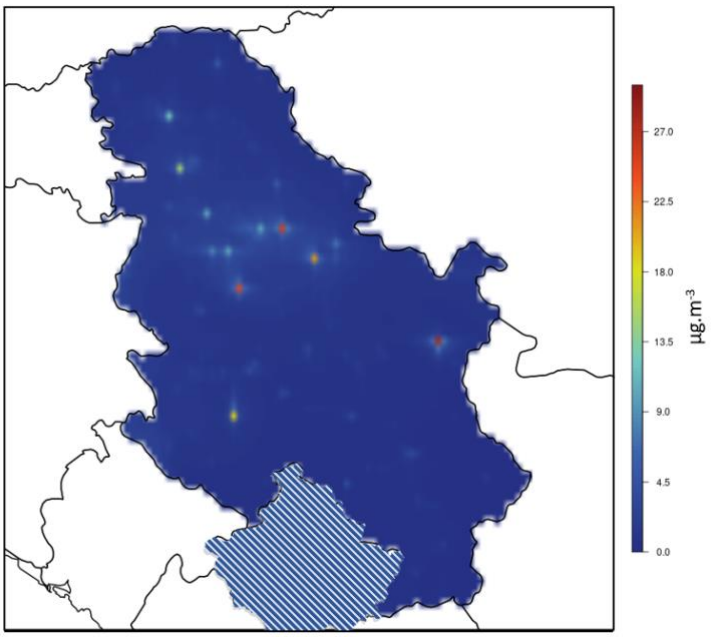
Концентрације SO_2 у референтној 2015. години



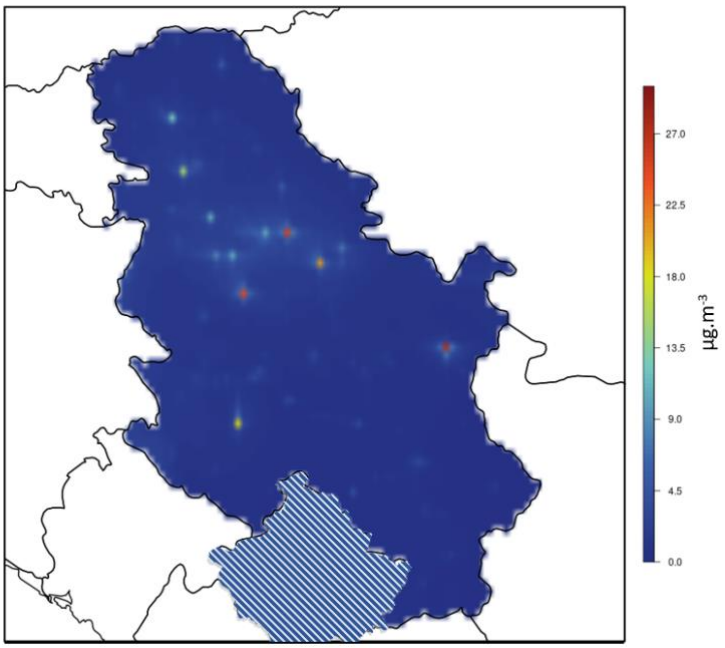
Концентрације SO_2 2030. године према сценарију WEM



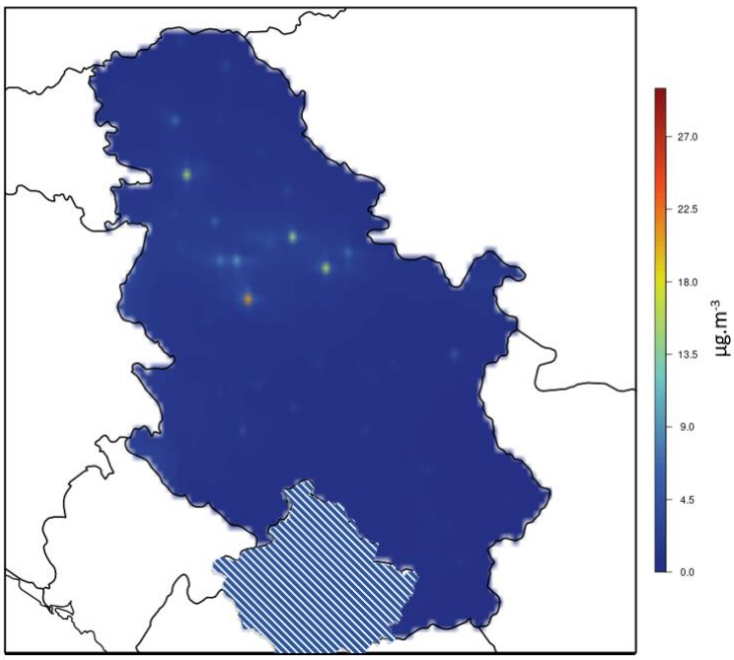
Концентрације SO_2 2030. године према сценарију WAM A



Концентрације SO_2 2030. године према сценарију WAM B



Концентрације SO_2 2030. године према сценарију WAM C



ANNEX 5

ANTICIPATED INTRODUCTION OF NEW APPLIANCES COMPLIANT WITH THE ECODESIGN DIRECTIVE

Target values of the Action Plan (summary)	2024	2025	2026	2027	2028	2029	2030
Total number of appliances that meet the requirements of the Eco-design Directive, entire Republic of Serbia							
Solid fuel appliances that meet the requirements of the Ecodesign Directive (logs and pellet)	32577	90002	249337	404221	554653	700632	842160
Heat pumps replace solid fuel appliances	1159	6136	13514	20696	27682	34472	41066
Details about Kragujevac (summary)							
Wood appliances that meet the requirements of the Ecodesign Directive (75% logs and 25% pellet)	669	2659	5921	9112	12234	15285	18266
Heat pumps	0	0	0	0	0	0	0
Details about Belgrade (summary)							
Wood appliances that meet the requirements of the Ecodesign Directive (pellet)	4072	16120	35642	54466	72591	90018	106747
Heat pumps	0	0	0	0	0	0	0
Details about Niš (summary)							
Wood appliances that meet the requirements	495	2458	5541	8555	11498	14372	17176

of the Ecodesign Directive (pellet)							
Heat pumps	495	2458	5541	8555	11498	14372	17176

Details about Valjevo (summary)							
Wood appliances that meet the requirements of the Ecodesign Directive (pellet)	279	1384	3111	4787	6413	7988	9514
Heat pumps	279	1384	3111	4787	6413	7988	9514

Details about Užice (summary)							
Wood appliances that meet the requirements of the Ecodesign Directive (pellet)	68	405	858	1298	1724	2137	2537
Heat pumps	386	2294	4862	7354	9771	12111	14376