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Pollution from transportation means: Impacts and solutions

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Abstract
According to the 2016 National Environmental Status Report, the sources of air pollution in urban areas indicated in this report mainly include transportation, construction activities, and urban enterprises, residential activities, waste treatment and sources of pollution from suburban areas are considered as the main causes making the air environment in urban areas becoming increasingly painful. Of the total emissions that pollute the urban air environment, emissions from motorized road vehicles take the leading position. Among the types of transport vehicles, motorcycles and mopeds account for the largest proportion and are also the largest source of pollutant emissions. Explaining the root cause of the problem, according to experts, motor vehicles use gasoline and diesel as fuel, the process of leakage, evaporation and burning of fuel also leads to many types. toxic gases such as VOC, Benzene, Toluen. The emission of motorized road vehicles is shown to depend heavily on the quality of vehicles, fuel, speed, driver, congestion and roads. Cars and motorbikes in Vietnam include many types that have been used for many years and are not regularly maintained, low fuel efficiency, high levels of toxic substances and dust in emissions. Motorbikes are still a major contributor of polluting gases, especially for emissions such as CO and VOC. Meanwhile, trucks and passenger cars emit a lot of NO2, SO2.

Keywords: air pollution, climate change, transportation means

1. Introduction
In recent years, the number of private vehicles has increased rapidly, making air pollution in urban areas across the country increasingly serious. Transportation activities are currently considered a major and worrying source of pollution to the air environment in our country, especially in urban areas and densely populated areas where activities pine flourish. Ho Chi Minh City Department of Transport has just reported to Ho Chi Minh City management about the environmental pollution caused by transportation activities is at an alarming level. Currently, the city has more than 8 million vehicles (of which more than 7 million motorbikes) are operating every day emitting a tremendous amount of emissions into the environment, increasing air pollution and The cause of disease risks for people in the area and people in traffic. More specifically, there are many old and outdated vehicles that still exist and are naturally involved in traffic, which not only threatens the safety of life for road users, but also affects the safety of traffic. Seriously affecting the air quality of urban centers and people's health. Ho Chi Minh City has a large source of greenhouse gas emissions with 38.5 million tons of CO2, accounting for about 16% of national emissions. In particular, greenhouse gas emissions from the transport sector accounted for 45%. Controlling greenhouse gas emissions in urban transport activities, contributing to reducing greenhouse gas emissions is an urgent environmental problem for Ho Chi Minh City. According to the statistics of motor vehicles in Ho Chi Minh City, in 2010, the city had about 4.5 million motorbikes and 420,000 cars. By 2017, this figure was 7.5 million motorcycles and 790,000 cars. It is estimated that by 2020, the number of vehicles will increase by about 30% with about 9 million motorbikes and nearly 800,000 cars. During operation, vehicles release substances such as dust, CO, CO2, NOx, SOx, gasoline vapors, lead dust, benzene ... into the air. The air quality measurement results in 2017 compared to 2016 of Ho Chi Minh City Department of Natural Resources and Environment show that the concentration of CO, CO2,

suspended particulate PM10 tend to increase at some measurement stations in An Suong, Phu Lam, Cat Lai and Hang Xanh areas. The same situation is that Hanoi Capital also has a huge amount of vehicles. According to some statistics, Hanoi currently has more than 7 million people, accompanied by an equal number of personal vehicles. It is predicted that this number of personal vehicles will increase in the near future. By 2020, the number of cars will increase to 843,000 units, and 6.1 million motorbikes; in 2025, cars will be 1.45 million units and motorbikes will be 7 million pieces and in 2030, cars will be 2 million pieces and motorbikes will be 7.5 million pieces. According to a report of the Department of Environmental Protection - Hanoi Department of Natural Resources and Environment, the air quality in many residential areas, roads, craft villages and industrial parks tends to improve gradually time. Statistics also show that 70% of the smog causing air pollution in Hanoi is due to traffic activities. Some areas with high concentrations of dust pollution are concentrated in the districts of Ha Dong, Hoang Mai, Cau Giay, Tu LiemThe burning process does not run out of fuel also emits carbon dust. This source of dust is often deposited on the road, or follows the vehicle and often entrails the tires when the vehicle is running, which is also considered as a factor from traffic emissions. In addition, another reason for the increasingly polluted urban environment is that the roads are cramped, degraded, lack of synchronous planning, do not meet the travel needs, and the sense of participation. Traffic of people is not high, causing traffic congestion. It is also a significant factor that exacerbates the problem of air pollution, especially in big cities such as Ho Chi Minh City. In addition to the reason that traffic causes environmental pollution in urban areas, experts also pointed out some other major causes such as industrial activities in the inner city, construction activities, and activities. Livelihood and waste treatment. Regarding the causes of emissions in industrial activities in urban areas in urban areas, the 2016 national environmental status report on the topic of urban environment said that there are still many production facilities in urban areas of export industry. The lack of control in operation management at construction sites operating across the country (construction, repair of houses, roads, material transportation) was also reported as one of the causes that have been causing serious pollution. Activities such as burning fossil fuels (coal, kerosene and gas), firewood, etc., or burning uncontrolled waste also contribute to increasing the concentration of pollutants in the air. However, there is a good signal that according to experts, recently the source of air pollution from daily life activities in urban areas has decreased sharply due to improved living conditions and changing habits.

Fig. 1: Emissions from out-of-date transportation means

Especially in two big cities, Hanoi and Ho Chi Minh City, are the two leading economic drivers of Vietnam, but along with the economic development, the traffic in these two cities is seriously degraded. The rapid increase of the population makes the traffic of these two cities often overloaded, causing traffic congestion. In addition, the connection between traffic modes is also a concern. Accordingly, Vietnam's transport has a huge imbalance between road transport and inland waterway transport. Over the past years, Vietnam's road traffic has grown fast and is hot. That increases the situation of traffic accidents (156 times higher than inland waterways) high logistics transport costs, impacts on the environment, causing the greenhouse effect (3.4 times higher than roads). In the air pollution in the capital, the main challenge is still the source from cars and motorbikes. Vehicle management data shows that a continuous increase of 20-30% of vehicles per year, such a continuous increase also means a continuous increase in emissions, of which the most dangerous is the emissions inspection with motorcycles are still floating. Hanoi is implementing a series of solutions such as promoting the planting of 1 million trees from now to 2020. Along with that, the city has also approved the project of transport management, development of public transport. Accordingly, by 2030, the entire inner city area will ban motorcycles. Not just motorcycles, TP. Hanoi also

proposed a solution to manage other private vehicles through administrative and economic measures. The Department of Transport of Ho Chi Minh City also urged the city government to propose to the Prime Minister early to approve the scheme on checking and controlling motorcycle emissions set by the Ministry of Transport. Accordingly, the application of emission standards to motorbikes with a capacity of 175cm3 or more in the period 2018-2020 is a premise to apply to other models. It is known that in the past, the Ministry has also developed the Emission Control Scheme for motorcycles and mopeds in some big cities, after which it will be put into mass deployment. However, after many years of research, this plan has not been implemented for many reasons such as: Some localities have not been drastic, have not agreed on the roadmap nor agreed on the compulsory motorcycle inspection.

2. Environmental pollution in Vietnam

Gasoline cars (nearly 75% in the US), followed by airplanes (about 5%), tractors and other agricultural machines (nearly 4%), rail and road transport water (about 2%) accounts for the major proportion of air pollution. The main pollutants emitted by mobile sources (total of which are over 40) include carbon oxides (approximately 70% of the volume in the US), hydrogen carbide (about 19%), and nitrogen oxides (nearly 9%). Carbon monoxide (CO) and nitrogen oxides (NOx) enter the atmosphere with only internal combustion engine exhaust, and incomplete combustion hydrocarbons () enter the atmosphere with exhaust gases (about 60%). total amount of exhausted hydrocarbons) as well as from the engine compartment (nearly 20%), fuel tanks (nearly 10%) and carburetors (approximately 10%); The solid impurities entering the atmosphere are mainly accompanied by exhaust gas (90%) and from the engine compartment (10 HnCm%). The largest amount of pollutants are emitted during driving, especially when running fast, as well as while moving at a small speed. The relative ratio (compared to the total emissions) of the highest hydrocarbon and carbon oxides during braking and when idling, the ratio of nitrogen oxides - during running. From these data, it is deduced that cars particularly pollute the air environment at frequent stops and when traveling at low speeds. "Not blocking" a significant reduction in the number of traffic stops at intersections is aimed at reducing atmospheric air pollution in cities. Engine operating mode, for example the correlation between fuel mass and air, combustion time, fuel quality, combustion chamber surface ratio to its volume ... has a great influence on quality and quantity and impurity emissions. By increasing the ratio of the amount of air and fuel entering the combustion chamber, the carbon dioxide and hydrogen carbide emissions are reduced, but the emissions of nitrogen oxides are increased. Although diesel engines are more economical, they release substances such as CO, HnCm, NOx are not much more than gasoline engines, but they emit more smoke (mainly unburnt carbon), moreover, they have an unpleasant odor (due to some unburnt hydrocarbons). Combined with the noise generated, diesel engines not only pollute the environment more strongly, but also affect human health far more than gasoline engines. The pollutants from aircraft engines are not relatively large (for cities, one country), but in the airport areas, these emissions contribute significantly to environmental pollution. Moreover, the jet turbine engines (as well as the diesel engines) while lowering and taking off give off a noticeable smog. Significant amounts of impurities in the airport are also caused by vehicles moving on the ground, cars coming and going. At Los Angeles Airport, in 1970, emissions from airplanes and ground vehicles were as follows: HnCm NOx Carbon Emission Emission (tons).

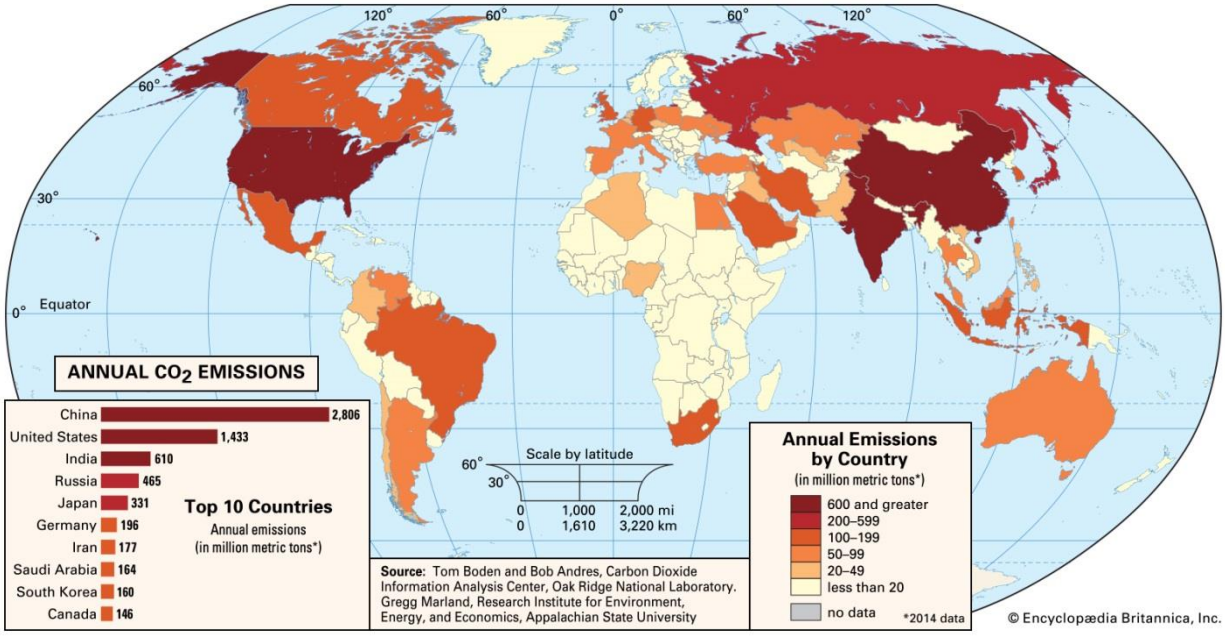

Fig. 2: Emission in the world from transportation means

The total emissions that pollute the urban air environment, emissions from motorized road vehicles take the leading position. Among the types of transport vehicles, motorcycles and mopeds account for the largest proportion and are also the largest source of pollutant emissions. To explain the root cause of the problem on motor vehicles using gasoline and diesel as fuel, the process of leakage, evaporation, and burning of fuel also leads to the

generation of many toxic gases such as VOC, Benzene, Toluene ... Emissions of motorized vehicles are shown to depend heavily on vehicle quality, fuel, speed, driver, congestion and roads. Cars and motorbikes in Vietnam include many types, many have been used for many years and have not been regularly maintained, low fuel efficiency, high levels of toxic substances and dust in emissions. Motorbikes are still a major contributor of polluting gases, especially for emissions such as CO and VOC. Meanwhile, trucks and passenger cars emit a lot of NO2, SO2. The burning process does not run out of fuel also emits carbon dust. This source of dust is often deposited on the road, or following the vehicle and often entraining tires when the car is running is also considered as a factor from traffic emissions. Another reason for the increasingly polluted urban environment is that the roads are narrow, degraded, lack of synchronous planning, do not meet the travel needs, and the sense of participation in traffic of People are not high cause of traffic congestion is also a significant factor that exacerbates the problem of air pollution, especially in big cities like Hanoi and Ho Chi Minh City. Ho Chi Minh. In addition, dirt and rock dust on the road due to poor road quality, dirty roads, and transportation of construction materials and garbage, when vehicles running through the dust from the road surface are lifted. Currently, motorized vehicles use gasoline and diesel as fuel to create movement, the combustion of this fuel has led to the generation of many different air pollutants, including CO, VOCs, SO2, NOx, lead dust, ... Besides, it also leads to the formation of TSP dust due to sand and soil being swept up from the unsanitary street surface during transportation. More dangerous, experts point out that the increase in road motor vehicles, especially cars and motorcycles, along with the quality of the roads do not meet the demand, the quality of fuel used. Low usage is the main cause of air pollution. Along with that, the quality of vehicles is limited (used cars, not regularly maintained), significantly increasing the concentration of pollutants in the air. Many roads are cramped, downgraded, lack of synchronous planning, not meeting the demand for travel together with the low awareness of people in traffic, causing traffic congestion, which is also a serious factor. More serious problems of air pollution, especially in big cities such as Hanoi and Ho Chi Minh City. Ho Chi Minh. Given the above situation, Vietnam needs to take measures such as: Carrying out inspection and maintenance programs. Accordingly, registered vehicles must be inspected for annual emissions before issuing or changing driver licenses. Encouraging traffic environment sanitation by spraying water and sweeping roads; encourages the development of clean energy transport means such as natural gas, liquefied gas, fuel alcohol, biodiesel, and electricity. In big cities such as Hanoi, Ho Chi Minh City, Can Tho ... air pollution is quite high. Especially very fine dust pollution. Hanoi is one of the 10 cities in the world most polluted by dust. This type of pollution is worrying. If normal dust pollution is used, masks can be prevented, while fine dust pollution is useless. Dust gets into deep lungs, causing respiratory diseases, even cancer. Therefore, in order to control air pollution in urban areas, it is necessary to control emission sources from cars and motorbikes and to check emissions of cars and motorbikes. Limited implementation of private vehicles, development of public transport. Along with that, it is necessary to enhance the awareness of road users. Many people now have the habit of using the vehicle for a long time without care and repair. Many people's awareness of participating in traffic, causing traffic jams are also significant factors that make air pollution worse, especially in big cities. Polluted air will affect contact organs such as eyes, respiratory organs, skin. Through contact with pollutants, it will seep into the bloodstream, into body organs, causing long-term diseases. Air pollution not only affects human health but also affects the treatment process of patients, making the disease worse, prolonging treatment time. Air pollution is a situation in which foreign substances appear in the air. But now, people are only interested in the physical part, which is the size of the particle affected in the air, but the nature of air pollution is completely different. In the mountains or with mist, air quality is not good but does not affect health. Meanwhile, in industrial areas, dust mist completely different will affect health. Therefore, it is necessary to control which pollutant particles carry the anxiety and find a suitable solution. Air pollution is closely related to climate change, in which burning fossil fuels both causes climate change and is a major driver of air pollution. Climate change mitigation efforts can also improve polluted air and vice versa. Recently, the United Nations Intergovernmental Panel on Climate Change warned that if the process of producing coal-fired thermal power does not end by 2050, the temperature of the Earth will rise by more than 1.5 degrees Celsius and we could see a major climate crisis in the next 20 years. Air pollution is closely related to climate change, in which burning fossil fuels both causes climate change and is a major driver of air pollution. Climate change mitigation efforts can also improve polluted air and vice versa. Recently, the United Nations Intergovernmental Panel on Climate Change warned that if the process of producing coal-fired thermal power does not end by 2050, the temperature of the Earth will rise by more than 1.5 degrees Celsius. And we could see a major climate crisis in the next 20 years. WHO believes that the sources of polluting energy now create great health burdens, so it is necessary to switch to cleaner and more sustainable options for energy supply and transportation of food systems effectively? The first global conference on air pollution and health will raise awareness about the harmful effects and risks to public health, as well as share information on the effects of air pollution. Along with the increase in population and global warming, the air that people breathe every day is also seriously polluted because the engines and industrial processes continue to emit a lot of dirty air. Air pollution affects human health, is the cause of many diseases and a major factor leading to high morbidity and mortality, especially in developing countries like Vietnam. Therefore, practical measures to reduce air pollution in Hanoi or Ho Chi Minh City are very important, needing more attention and investment in implementation. The inevitable trend of transport today is to reduce the number of greenhouse gases emitted by vehicles. Therefore, green transportation should be in association with urban development. However, in order to build a green transportation system, firstly, it is necessary to completely develop the transport network system according to the approved plan. Promote the application of scientific and technical advances and new technologies to design, construction, exploitation, and maintenance of transport

infrastructure in an environmentally friendly manner; developing the network of public passenger transport; control emissions from vehicles; strengthening management capacity and raising awareness about transportation environmental protection for managers. Besides, it is necessary to build pedestrian streets, encouraging communities to participate in traffic by non-motorized vehicles such as bicycles, trams and walking. At the same time, it is encouraged to invest in high-volume public transport vehicles using clean energy, causing less environmental pollution such as subways, SkyTrain and fast buses. Developing green urban areas and green transportation is a strategic orientation, which needs attention in the synchronization of authorities, socio-political organizations from the central to local levels and the whole community. Copper. Therefore, Vietnam needs to have besides, the construction of walking streets, encouraging the community to participate in traffic by means of non-motorized vehicles such as bicycles, trams and walking. At the same time, it is encouraged to invest in high-volume public transport vehicles using clean energy, causing less environmental pollution such as subways, SkyTrain and fast buses. Developing green urban areas and green transportation is a strategic orientation, which needs attention in the synchronization of authorities, socio-political organizations from the central to local levels and the whole community. Copper. With the right mindset, appropriate roadmap and innovative solutions, green urban development, green transportation will play an important part in successfully implementing the objectives of the National Green Growth Strategy.

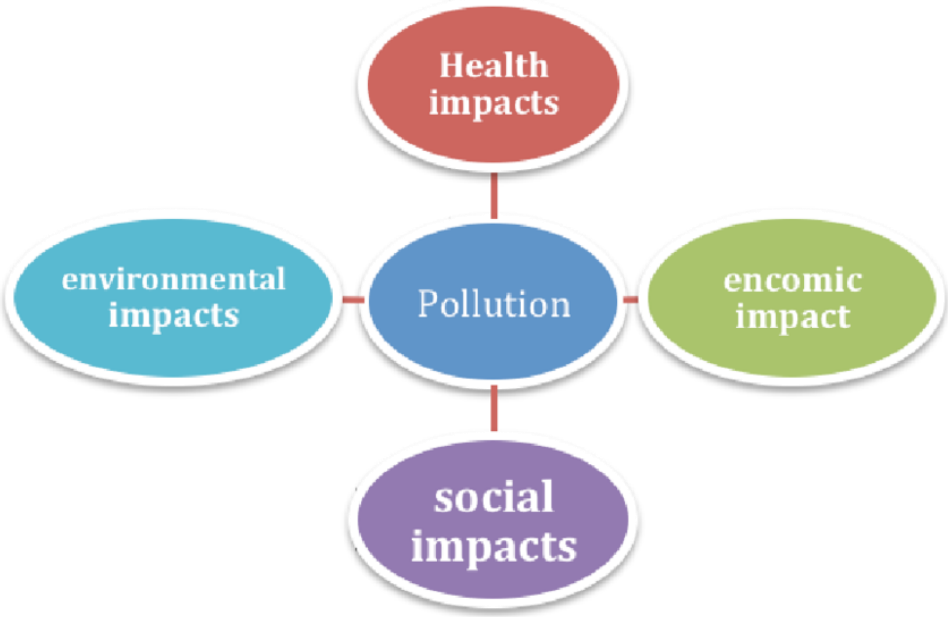

Fig. 3: Impacts of environmental pollution

Firstly, it is necessary to change the perception of managers, businesses, and people about green transport, considering it a central issue of urban development. Accordingly, the authorities need to create a diverse transportation environment, which prioritizes environmentally friendly means of transport, gradually changing the habits of road users towards green and sustainable. Construction of urban transport infrastructure combined with tree planting contributes to the greening of the urban landscape. In parallel with the promotion of education, propaganda and raising the people's self-awareness in observing the provisions of the law on vehicle quality, methods, and skills of participating in traffic. Secondly, complete development of the transport network system according to the approved plan; promote the application of new scientific and technical advances to the design, construction, exploitation, and maintenance of transport infrastructures in an environmentally friendly manner; strengthening management capacity and raising awareness about environmental transportation protection ... According to environmental experts, motor vehicles now use gasoline and diesel as fuel to create movement, the burning of this fuel has led to the generation of many pollutants. Air pollution varies, including: CO, VOCs, SO2, NOx, lead dust, etc. Besides, it also leads to the formation of TSP dust due to the sand being swept up from the unsanitary street surface in migration process. More dangerous, experts point out that the increase in road motor vehicles, especially cars and motorcycles, along with the quality of the roads do not meet the demand, the quality of fuel used. Low usage is the main cause of air pollution. Along with that, the quality of vehicles is limited (old cars, not regularly maintained), significantly increasing the concentration of pollutants in the air. Many roads are cramped, downgraded, lack of synchronous planning, not meeting the demand for travel together with low awareness of people in traffic, causing traffic congestion is also a significant factor. More serious problems of air pollution, especially in big cities such as Hanoi and Ho Chi Minh City. Given the above situation, Vietnam needs to take measures such as: Carrying out inspection and maintenance programs. Accordingly, registered vehicles must be inspected for annual emissions before issuing or changing driver licenses. Encouraging traffic environment sanitation by spraying water and sweeping roads; encourage the development of clean energy transport means such as natural gas, liquefied gas, fuel alcohol, biodiesel and electricity. Assessing the current pollution situation,

Deputy General Director of Vietnam Environment Administration (MONRE), Hoang Duong Tung, said that in big cities such as Hanoi, Ho Chi Minh City, Can Tho ... the situation Air pollution is quite high. Especially very fine dust pollution. Hanoi is one of the 10 cities in the world most polluted by dust. This type of pollution is worrying. If normal dust pollution is used, masks can be prevented, while fine dust pollution is useless. Dust gets into deep lungs, causing respiratory diseases, even cancer.

3. Conclusion

Objectively acknowledged, to reduce air pollution, Hanoi is implementing a series of solutions. The most evident evidence is that Hanoi has been actively promoting the planting of 1 million trees from now to 2020. Along with that, the Hanoi People's Council has also approved the Project on management of vehicles. Accordingly, by 2030, the entire inner city area will ban motorcycles. To carry out this task, in the coming years, the city will organize the investigation, review and statistics of the number of used motorcycles in the area (according to the year of manufacture) through registration, from there. Proposing handling measures for vehicles that do not meet the quality, technical safety and environmental sanitation; proposing regulations on technical standards and emission standards for motorcycles. Not only motorbikes, the city also proposed solutions to manage other private vehicles through administrative and economic measures. Specifically: Will review, amend and promulgate parking service prices in progressive manner by hour, by region; collecting motor vehicle fees to some areas in the city that are at risk of traffic congestion and environmental pollution ... This is a project highly appreciated by experts and researchers because it will "block" the cell. Infection from the root. While the authorities are trying to implement measures to improve transport infrastructure, tighten regulations and control vehicle emissions, each person involved in the traffic should have changes in habits and awareness in the selection of vehicles that ensure emission standards, regular maintenance, periodic vehicle warranty according to the manufacturer's instructions and should not circulate vehicles. Old and broken this can ensure a clean, green and environmentally friendly urban environment.

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