Opinion of the European Economic and Social Committee on ‘Emissions from road transport — concrete measures to overcome stagnation’

(Own-initiative opinion)
(2009/C 317/04)

Rapporteur: Mr IOZIA

On 17 January 2008 the European Economic and Social Committee, acting under Rule 29(2) of its Rules of Procedure, decided to draw up an own-initiative opinion on

Emissions from road transport — concrete measures to overcome stagnation.

The Section for Transport, Energy, Infrastructure and the Information Society, which was responsible for preparing the Committee’s work on the subject, adopted its opinion on 26 June 2009. The rapporteur was Mr Iozia.

At its 455th plenary session, held on 15 and 16 July (meeting of 16 July), the European Economic and Social Committee adopted the following opinion by 109 votes to seven.

1. Conclusions and recommendations

1.1 Combating air and noise pollution involves a range of institutions. A key role is played by the European Community institutions, which are responsible for promoting and updating legislation, by the Member States whose responsibility it is to put this legislation into practice by means of implementing provisions, and by local authorities, who are responsible for monitoring pollution and noise. The responsibility for the fact that progress has stagnated is a shared one, and every level of responsibility should step up its efforts to eliminate or minimise the risks to public health and wellbeing.

1.2 Emissions from private, public and goods road transport cause serious illness and erode quality of life, especially for urban populations, representing more than 75% of European citizens. In spite of the Commission’s initiatives, such as its recent Greening Transport package, to adjust European legislation, in the Member States progress in combating air and noise pollution caused by traffic is visibly stagnating.

1.3 Legislation – at least concerning the quality of ambient air – has over the years been adjusted and improved. In contrast, there has been a lack of progress regarding the quantity and quality of monitoring of motor vehicles, including two- and three-wheelers, and of the amounts of gas and particulates in the air. Recognition should be given to the strenuous efforts, including technical and scientific ones, made by the Commission with the TREMOVE programme and programmes to analyse the effects of the various transport sector policies, and with the development of the COPERT 4 system (Computer Program for calculating Emissions from Road Transport) in the framework of the activities of the European Topic Centre on Air and Climate Change, further developed by the Joint Research Centre. This methodology is a part of the EMEP/CORINAIR Emission Inventory Guidebook, developed by the United Nations Economic Commission for Europe (UNECE) Task Force on Emissions Inventories and Projections.

1.4 The Greening Transport package contains a proposal to reduce noise pollution caused by rail traffic, while on 22 June 2009 the regulation on the general safety of motor vehicles (COM(2008) 316 final) was adopted, inclusions provisions to substantially reduce the level of noise from tyres.

1.5 The EESC recommends that the Commission, the Environment Council, the Employment, Social Policy, Health and Consumer Affairs Council, and the European Parliament take immediate steps to strengthen control measures, thereby protecting citizens’ health. Off-cycle and on-road controls, particularly during use, would show that today’s vehicles are noisier than those of 30 years ago, and their emissions are considerably higher than those recorded in the cycle tests.

1.6 The EESC emphasises the lack of a consolidated approach: the UN/ECE rules do not provide for effective control systems, like EU regulations and the self-certification model. Leaving checks to market control mechanisms has been shown to be inadequate.

1.7 The EESC points to a range of actions that various European Union, Member States and region authorities could take to lessen the effects of ambient air pollution:

— involving the general public, directing it towards patterns of behaviour conducive to the general good, increasing transparency and information through visual displays and websites;

— gearing education and training to environmental and ecological issues;
— disseminating best practices such as the mobility card giving free entitlement to public transport;

— using electric trams and trolleybuses for urban transport, which can now also be powered by batteries, enabling them to operate in areas without overhead wiring;

— restricting private traffic by improving and stepping up public transport;

— adopting differentiated taxation for vehicles and fuels, depending on their level of pollution, imposing charges to enter city centres graded to the ability to pay and the emissions produced;

— internalising external costs, particularly the costs to human health;

— developing integrated transport policies, establishing the degree of environmental sustainability of individual projects;

— helping to shift lifestyles in a less wasteful and more eco-friendly direction;

— supporting sustainability mobility by walking or cycling for short distances, enhancing the infrastructure provided for pedestrians and cyclists;

— avoiding unnecessary travel;

— reviewing logistics management and just-in-time production;

— promoting teleworking wherever possible;

— reducing traffic congestion by optimising use of all transport modes, with a preference for public transport;

— supporting research and innovative development of technological materials and solutions to reduce levels of polluting agents produced by traffic and road transport, such as hydrogen fuel cells for cars, electric cars and low-emission hydrocarbons such as synthetic gas, methane and LPG;

— carrying out regular, stricter controls especially in countries where the vehicle fleet is more obsolete and polluting (e.g., 60 % of motor vehicles in Poland are more than 10 years old).

1.8 In order to lessen the impact of noise pollution, the following could be introduced:

— restrictions on private traffic at night in residential areas;

— speed reduction devices on road surfaces;

— improved road surface quality;

— noise-absorbing panels in areas of high traffic density;

— penalties with real deterrent effect for vehicles that exceed noise emission limits, up to and including impounding vehicles, and focusing especially on two- and three-wheelers;

— noise tests that more closely reflect ‘normal’ vehicle operating conditions;

— more frequent medical checks for people most exposed to the risk of noise pollution;

— effective steps to reduce traffic congestion, and more particularly the widespread introduction of priority lanes and dedicated sites for public transport;

— specific provisions and appropriate arrangements for people who work on the roads at ground and who breathe polluted air and/or are exposed to continuous noise.

1.9 Life Cycle Assessment (LCA) methods should also be applied to indirect transport-related emissions:

— production and transport of fuel (extraction, transport to refinery and to the petrol pump; in the case of battery-powered vehicles, emissions caused by electricity generation);

— vehicle production (manufacturing industry emissions, including disposal of waste material);

— streets and car parks (if parks and green areas are used for their construction, air quality suffers through a reduction in photosynthesis).

1.10 The present opinion concentrates on the emission of pollutants and on the noise produced by road traffic. Discussions have revealed a need for other modes of transport and leisure vehicles to be examined, together with the pollution caused by agriculture. Trains, aircraft, ocean-going and inland navigation vessels, non-road mobile machinery, such as tractors or earth-moving equipment, construction machinery and mining machinery should also be controlled (1)

2. Introduction

2.1 The entire energy and climate package has been adopted by the European Council, albeit with some difficulty. The EU can now attend the Copenhagen conference in December with its house fully in order, and consolidate its position as world leader in its determination to combat GG (greenhouse gas) emissions.

2.2 The same cannot be said of the results from initiatives to prevent emissions of pollutants and noise produced by transport vehicles.

2.3 Traffic has a harmful impact on public health in two main ways: the emission into the atmosphere of polluting substances, and noise. The main pollutants caused by traffic that have a directly harmful effect on health are: nitrogen oxide and dioxide (NO and NO₂), carbon monoxide (CO), sulphur dioxide (SO₂), ammonia (NH₃), volatile organic compounds (VOCs), and particles or aerosols. These substances are defined as primary pollutants, as they are emitted directly by motor vehicles, while other substances, described as secondary pollutants, are produced by reactions in the atmosphere. The latter include ozone, ammonium nitrate (NH4NO₃), ammonium sulphate ([NH₄]₂[SO₄]), and secondary organic aerosols.

2.4 Road transport is responsible for the bulk of emissions of NOₓ (39.4 %), CO (36.4 %) and NMVOCs (17.9 %) (non-methane volatile organic compounds), and is the second-largest source of emissions of PM10 (17.8 %) and PM2.5 (15.9 %) (European Environment Agency (EEA), Technical report No 7/2008, 28 July 2008).

2.5 Natural primary particulates are caused by volcanic eruptions, forest fires, erosion and crumbling of rock, plants (pollens and vegetable residues), spores, sea spray and insect remains. Natural secondary particulates are made up of very fine particles produced by the oxidation of various substances such as sulphur dioxide and hydrogen sulphide emitted by fires and volcanoes; nitrogen oxides released from the ground; and terpenes (hydrocarbons) released by vegetation.

2.6 Primary particulates from anthropogenic activity are due to: the use of fossil fuels (domestic heating, thermal power stations, etc.); motor vehicle emissions; wear and tear on tyres, brakes and road surfaces; various industrial processes (foundries, mines, cement works, etc.). The huge amounts of dust that can be generated by various farming activities should also be pointed out. Secondary particulates from anthropogenic activity, in contrast, stem essentially from the oxidation of hydrocarbons and sulphur and nitrogen oxides emitted by a range of activities.

2.7 Particulate matter is classified by size, ranging from nanoparticles to fine particles and even visible dust. Particles with a diameter of less than 10 μm are defined as PM10 and those with a diameter of less than 1 μm as PM1, with the smallest being the most dangerous as they penetrate most deeply into the lungs.

2.8 Other substances emitted by motor vehicles are not directly harmful to health but, according to the EEA, seriously damage the environment. These include the greenhouse gases carbon dioxide (CO₂), methane (CH₄) and nitrous oxide (N₂O). They too are a source of considerable social concern, and their concentrations are limited by vehicle emissions standards.

2.9 At the same level of traffic emissions, concentrations of pollutants at ground level vary depending on weather conditions. Low ground temperatures, especially when thermal inversion occurs, prevent the convection currents that mix air in the atmosphere, and facilitate the accumulation of pollutants at lower levels. This is particularly frequent in mountain valley areas, where the effects of air pollution are especially worrying.

2.10 The effects of pollutants on health have been verified by epidemiological studies: chronic bronchitis and emphysema are short-term effects associated with high concentrations of particles, while there is also fragmentary evidence for association with allergic conditions such as asthma, rhinitis and dermatitis.


2.12 In order to take account of the varying sensitivity of the hearing system to the different frequencies of the acoustic spectrum (20 to 20 000 Hz) when calculating exposure to noise, weighting curves are used to determine spectral density measured according to the sensitivity of the hearing system. The most commonly used is weighting curve A, which provides a weighted measure of exposure expressed in dB(A).

3. European legislation

3.1 Air quality

3.1.1 Air quality is one of the areas in which Europe has made the greatest efforts in recent years to develop a comprehensive strategy, establishing long-term air quality objectives. Directives have been introduced to control the levels of some pollutants and to monitor their concentrations in the atmosphere.

3.1.2 In 1996, the Council of Environment Ministers adopted framework Directives 96/62/EC on ambient air quality assessment and management. The directive revises existing legislation and introduces new air quality standards for air pollutants that had not previously been regulated, laying down a timetable for drafting daughter directives on a series of pollutants. The list of pollutants covered by the directive includes sulphur dioxide (SO₂), nitrogen dioxide (NO₂), particulate matter (PM), lead (Pb) and ozone (pollutants governing by previously existing ambient air objectives), benzene, carbon monoxide, polycyclic aromatic hydrocarbons, cadmium, arsenic, nickel and mercury.
3.2 Daughter directives

3.2.1 The framework directive was followed by a number of daughter directives laying down numerical limit values or, in the case of ozone, reference values for each pollutant identified. In addition to setting air quality limits and alert thresholds, the directives set out to harmonise air quality monitoring strategies and methods for measurement, calibration and assessment with a view to achieving comparable measurements throughout the EU and providing useful public information.

3.2.2 The first daughter directive (1999/30/EC), on limit values for NOx, SO2, Pb and PM in ambient air, came into force in July 1999. In order to make a harmonised and structured system of reports possible, the Commission laid down detailed measures enabling each Member State to supply information on its own plans and programmes. These measures are set out in Decision 2004/224/EC.

3.2.3 The second daughter directive (2000/69/EC), relating to limit values for benzene and carbon monoxide in ambient air, came into force on 13 December 2000. The annual reports to be submitted under the terms of the directive must comply with Commission Decision 2004/461/EC.

3.2.4 The third daughter directive, 2002/3/EC, relating to ozone in ambient air, was adopted on 12 February 2002 and lays down long-term objectives that correspond to the new guidelines and reference values stipulated by the World Health Organization for concentrations of ozone in ambient air, to be met by 2010. These objectives are in keeping with Directive 2001/81/EC on national emission ceilings.


3.2.6 Directive 2008/50/EC was recently adopted, concerning ambient air quality and cleaner air for Europe. It merges the framework directive and the first three daughter directives, postponing the incorporation of the fourth daughter directive until sufficient experience of implementation has been built up. This new directive establishes measurements for fine particulate matter (PM2.5), laying down national reduction targets, the average exposure indicator (AEI) and the limit value, set at 25 µg/m3 and 20 µg/m3 from 2020. The directive was adopted after taking on board the World Health Organisation (WHO) report on Air Quality Guidelines Global Update 2005, which demonstrated the dangerous nature of PM2.5, and also identified danger thresholds for NOx, SO2 and O3.

3.2.7 The major argument for using PM2.5 is that it is a better measure of anthropogenic activities, especially combustion sources (Report of the Scientific Committee on Health and Environmental Risks (SCHER), 2005).

3.3 Noise pollution

3.3.1 Directive 70/157/CE on the approximation of national laws relating to the permissible sound level of motor vehicles dates back to 1970.

3.3.2 It was however 1986 before Directive 86/188/EC, on the protection of workers from the risks related to exposure to noise, was adopted.

3.3.3 Directive 2002/49/EC of the European Parliament and of the Council of 25 June 2002 relates to the assessment and management of environmental noise, defined as all unwanted or harmful outdoor sound created by human activities, including noise emitted by means of transport.

3.3.4 Commission Directive 2007/34/EC of 14 June 2007 amending, for the purposes of its adaptation to technical progress, Council Directive 70/157/EC concerning the permissible sound level and the exhaust system of motor vehicles, and Regulation No 117 of the Economic Commission for Europe of the United Nations (UN/ECE) – Uniform provisions concerning the approval of tyres with regard to rolling sound emissions and to adhesion on wet surfaces (OJ L 231 of 29.8.2008) have since been adopted. To this should be added the recent adoption of the regulation on the general safety of motor vehicles (COM(2008) 316 final), including provisions to substantially reduce the level of noise from tyres.

4. Current situation

4.1 According to an EEA study (Exceedence of air quality limit values in urban areas. Core set of indicators assessment – December 2008) based on the ten-year period from 1997 to 2006, the percentages of the urban population potentially exposed to ambient air concentrations in excess of the EU limit values laid down for the protection of human health were:

— for particulate matter (PM10), 18-50 % (50 µg/m3 daily, not to be exceeded more than 35 days per calendar year);

— for nitrogen dioxide (NO2), 18-42 % (40 µg/m3 per calendar year), with a slight downward trend being recorded;

— for ozone (O3), 14-61 % (120 µg/m3 for a daily 8-hour maximum not to be exceeded more than 25 times per calendar year). A peak of 61 % was reached in 2003, but no discernible trend was detected;

— for sulphur dioxide (SO2), less than 1 % of the population was exposed to the limit value set (125 µg/m3 not to be exceeded for more than three days per calendar year).
5. **Harm caused by noise and air pollution**

5.1 Noise is today among the main causes of the deteriorating quality of life in cities. Although there has been a downward trend in the Community trend over the last 15 years regarding the highest noise levels in the worst black spots, at the same time the so-called "grey areas" have grown, meaning a larger population is exposed and the benefits of the former trend are wiped out.

5.2 Noise is generally defined as ‘unwanted sound’ or unpleasant and annoying sound.

5.3 There are three possible approaches to tackling noise:

- acting on the source of noise (reducing emissions at source or improving mobility conditions within a certain territorial area);

- acting on noise transmission (keeping residential areas as distant as possible from areas of greatest noise emission);

- adopting passive protection systems (noise barriers) for buildings most exposed to noise emission.

5.4 The most frequent illnesses caused by noise are of both auditory and extra-auditory types: impaired hearing, tinnitus (the ringing sometimes heard inside the ear, which can be caused by permanent damage to the cochlear hair cells), and problems connected with the cochlea-auditory nerve channel complex, and the Eustachian tube. Exposure to noise causes acute and chronic damage to the hearing system. Traffic noise does not reach levels capable of producing acute effects. The hearing system is capable of recovering from the negative effects of chronic exposure to noise if it has a sufficient period of rest. For this reason, chronic exposure limits often refer to total A-weighted exposure of workers measured over an 8-hour working day. In the EU, the personal daily exposure limit is set at Lex, 8h = 87 dB(A).

5.5 Extra-auditory illnesses may involve the emergence of cardiovascular pathologies, of disorders of the digestive system through stress, acute headaches or endocrine problems as a result of altered essential parameters. Recorded extra-auditory effects of noise include: annoyance, disturbed sleep, and complications of existing psychiatric pathologies. The link between high declared levels of annoyance (a subjective parameter) and traffic noise levels, including from rail transport, and especially at night, has been demonstrated in numerous studies. Disturbed sleep, directly caused by night-time traffic noise, is often accompanied by the appearance of other cardiovascular and endocrine pathologies, which typically do not diminish as exposure continues, unlike initial difficulty in falling asleep.

5.6 The picture concerning air pollution is very different. 500 000 people die worldwide each year as a result of ambient air pollution, and it has a downward effect on life expectancy (almost three million deaths due to indoor air pollution). According to research conducted by the Environmental Epidemiology and Tumour Registry Department of the Milan-based National Institute for the Study and Treatment of Tumours, if PM10 particles were to be reduced from 60 to 30 µg/m³ there would be 1 575 fewer deaths than the 13 122 that actually occur. Obvious food for thought for the citizens of that city!

5.7 This long-term extrapolation is drawn from a study carried out by C. Arden Pope III (published in JAMA, 2002 – Vol. 287, No 9) on a sample of 1 200 000 individuals belonging to the Cancer Society over an observation period extending from 1982 to 1998 (Lung Cancer, Cardiopulmonary Mortality and Long-term Exposure to fine Particulate Air Pollution). The WHO has accepted the parameters resulting from this study, which identifies the increase in the mortality risk for the population of 30 years of age or more at 6%.

5.8 Air pollution causes many illnesses such as acute and chronic bronchitis, disorders of the lungs and cardio-circulatory system, breathing difficulties such as dyspnoea, increased tumours, increased asthma attacks and acute inflammations of the eye.

6. **Workers exposed to noise and air pollution**

6.1 Many categories of workers are concerned by overexposure to a polluted urban environment. All those working on the roads are affected: maintenance workers, town and traffic police, petrol station workers, bus and commercial vehicle drivers. European and national legislation looks in detail at the potential risks to individual occupations, imposing suitable safety measures.

6.2 The legislation on air pollution at the workplace is particularly strict for industrial companies using hazardous materials. With regard to noise, all equipment or machines that cause noise emissions must comply with the limits laid down in the type-approval except in specific cases where the ceilings are exceeded; in such cases (pneumatic hammers, road drills) there is an obligation to use ear protectors.

6.3 There are no specific provisions for road-based workers who breathe polluted air or are subjected to continuous noise. With regard to bus drivers, for example, the on-board sources of noise and vibration should be reduced and driving cab sound-proofing improved. Excessive noise has a negative impact on driver performance by generating stress, increasing muscle strain and jeopardising precision of movement. Noise acts on the vegetative nervous system and impairs certain functions that are crucial to driving, such as judgment of speed and distance.
6.4 Improving health and safety conditions for workers is a responsibility that needs to be assumed at every political and administrative level, stepping up inspections and severely penalising those who infringe the safety standards. Workers are often involved in accidents that could be prevented if safety rules were kept properly up-dated on the basis of the most recent studies and technological progress. These include the most recent epidemiological studies on polluting factors that, as a side-effect, can produce loss of attention, with the ensuing irreparable consequences.

7. What initiatives should be taken against stagnating results?

7.1 Reports from European agencies reveal that the fight against polluting factors is far from won. The legal protection of citizens needs to be strengthened through a robust system of inspections, which must be conducted independently of administrations or local authorities.

7.2 According to a very recent EEA study, the main cause for the increase in harmful emissions is the growth in demand for transport, outstripping the gains made through fuel and energy efficiency: demand is often created by factors outside transport (shopping, working and holiday trips). Decisions taken outside the transport sector influence its carbon footprint without considering the consequences. A detailed analysis of sectors of economic activity outside the transport sector is needed (EEA, Beyond transport policy – exploring and managing the external drivers of transport demand, Technical report No 12/2008).

7.3 In some towns, so as not to hamper trade as a result of traffic restrictions, distribution centres have simply been shifted from the more polluted areas of cities to quiet suburbs – or data is simply no longer collected from such areas.

7.4 The self-certification scheme applied by the tyre manufacturing industry, with controls that are influenced by specific road surface conditions (texture, intrinsic capacity to absorb noise) is heavily slanted towards reducing in-vehicle noise rather than external pass-by noise, i.e. the noise perceived by the general population.

7.5 Noise pollution means the introduction of noise into the indoor or outdoor environment that is annoying or disturbing to rest and to human activities, harmful to health, damaging to ecosystems, tangible goods, monuments and the indoor or outdoor environment, or prevents the lawful enjoyment of these environments. It should be combated by means of an intelligent approach that involves the general public, encouraging it to adopt patterns of behaviour that will bring about collective well-being.

7.6 As well as fostering such behaviour, particularly among the younger generations through educational interaction from primary school onwards, there is a need to push ahead with targeted initiatives in order to achieve the goal of a low CO₂- and pollutant-emitting society.

7.7 Sustainable urban public transport should be supported by incentives. The city of Basle has adopted an interesting initiative under which, in agreement with hotel operators, it distributes a free (i.e. included in the price of the hotel) mobility card to visitors allowing them to use public transport free of charge for the number of days of their hotel stay. In other words, an incentive to leave the car at home.

7.8 Limiting urban traffic by giving preference to public passenger transport (7), differentiated taxation of vehicles and fuels in line with the emissions they produce (8), thereby internalising the external costs (9), and charging to enter city centres: the latter however after an initially positive impact in terms of reducing urban traffic, tends over time to lose its effectiveness, as in the cases of London, Stockholm and Milan. SUVs should be used in open areas, not in Europe’s small cities, which were designed for horse-drawn carts (although even they were a source of CH₄ emissions!).

7.8.1 The production and use of vehicles that comply more closely with air pollution limits are a key factor in any attempt to meet the goals set by the relevant European legislation.

7.9 The development of Intelligent Transportation Systems (ITS) (9). ITS vary in the technologies applied, from basic management systems such as satellite navigation, traffic signal control systems, speed cameras, and monitoring applications such as CCTV surveillance, together with advanced applications integrating live data from various external sources, such as weather information, bridge de-icing systems and so on.

7.10 Computational technologies, embedded in real-time operating systems and using the microprocessors pre-fitted in new cars; FCD (Floating Car Data)/Floating Cellular Data) system using signals from the mobile phones of those drivers who have them; internal and external sensing technologies; inductive loop detectors placed in the roadbed; and video identification may all be used.

7.11 Even urban and non-urban toll payment problems can be resolved with electronics. In addition to charge collection, Electronic Toll Collection (ETC) is used to monitor congestion trends by measuring the number of vehicles passing between two points in time.

(7) OJ C 168 of 20.7.2007, pp. 77-86.
(9) See page 80 of this Official Journal.
(9) EESC opinion CESE 872/2009 TEN/382, Deployment of intelligent transport systems, rapporteur: Mr Zboril (not yet published in the OJ)
7.12 There is a need for a debate on recreational vehicles (buggies, quads, off-road motorcycles, water scooters, snowmobiles, microlight aircraft). Noise and emissions with highly unpleasant smells are often an indissociable part of these vehicles. They generally do not have licence plates, but can be transported and parked legally. Their engines are usually subject to the general rules, but it may be questioned if these rules take sufficient account of the use of these vehicles in areas of great natural value. The rapidly spreading popularity of such vehicles not only raises environmental problems, but poses a technological challenge.

7.13 Internalisation of external costs, particularly the costs to human health, and integrated transport policies, establishing the degree of environmental sustainability of individual projects, the cost/benefit ratio, environmental improvement, job creation, impact on congestion.

7.14 Changing lifestyles. Supporting sustainable mobility by walking or cycling for short distances, enhancing the infrastructure provided for pedestrians and cyclists.

7.15 Reviewing logistics management and just-in-time production, which entails enormous expenditure on moving goods. Standardised designs, to rationalise spare parts.

7.16 Wherever possible, boosting teleworking.

7.17 Supporting research and innovative development of technological materials and solutions to reduce levels of polluting agents produced by traffic and road transport.

7.18 In order to lessen the impact of noise pollution, speed reduction devices could be installed on road surfaces, the quality of road surfaces themselves improved and noise absorbing panels erected in areas of high traffic density. Penalties with real deterrent effect for vehicles that exceed noise emission limits, up to and including impounding vehicles. Noise tests that more closely reflect ‘normal’ vehicle operating conditions.

7.19 Two- and three-wheel motorised vehicles are often the main cause of disturbing and harmful noise. Checks on their noise emissions should be stepped up, and they should be taken off the roads until a document formally certifying that they comply with existing legislation is produced.


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of the European Economic and Social Committee
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