9. PLAYING A PART IN THE SUSTAINABILITY OF TRANSPORT

Sustainability, a key objective for the motorcycle industry

Motorcycles, mopeds, tricycles and quadricycles sold in the EU comply with strict limits on tailpipe emissions and other pollution sources of the vehicle, such as evaporative emissions from the fuelling system. This has been made possible by steady progress in vehicle technology, which has helped meet progressively tighter emission standards as European rules have developed.

The implementation of European environmental standards, usually referred to as 'Euro' standards, is a highly technical and complex process. It involves extensive research and data analysis, and requires close cooperation between public authorities and industry.

To this end, ACEM is actively engaged in a constructive dialogue with key stakeholders including the European Commission, the European Parliament and the Council of the EU. The motorcycle industry advocates for standards that protect the environment and consumers, and are also technically attainable and economically viable.

A new legal framework for motorcycles and mopeds

In March 2013 the EU adopted Regulation 168/2013, which sets out rules to type-approve L-category vehicles in the EU[17]. This Regulation provides for new environmental requirements for PTWs as well as for different test procedures to assess compliance with these new standards. The technical details regarding the environmental provisions of this Regulation are laid out in a separate legal text[18].

The industry actively participated in the development of these two pieces of legislation. ACEM members provided the European Commission with information on energy consumption of different types of vehicles (i.e. internal combustion, hybrid and electric PTWs) and submitted concrete and detailed proposals on a wide range of areas: CO2 measurement, durability requirements, emission control and on board diagnostic systems, among others.

Some of the industry proposals and recommendations were incorporated into the final version of the mentioned texts to create a clear and comprehensive regulatory framework for vehicle homologation and market surveillance.

17 Regulation (EU) No 168/2013 of the European Parliament and of the Council of 15 January 2013 on the approval and market surveillance of two- or three-wheel vehicles and quadricycles.

18 Commission Delegated Regulation (EU) No 134/2014 of 16 December 2013 supplementing Regulation (EU) No 168/2013 of the European Parliament and of the Council with regard to environmental and propulsion unit performance requirements and amending Annex V thereof.

Key elements of the new environmental standards

Under Regulation 168/2013 new environmental requirements and a new testing method for sound emissions are introduced. Moreover, manufacturers of L-category vehicles will be required to provide information on CO2 emissions of their vehicles.

The Regulation also introduces an obligation to reduce emissions of the following substances:

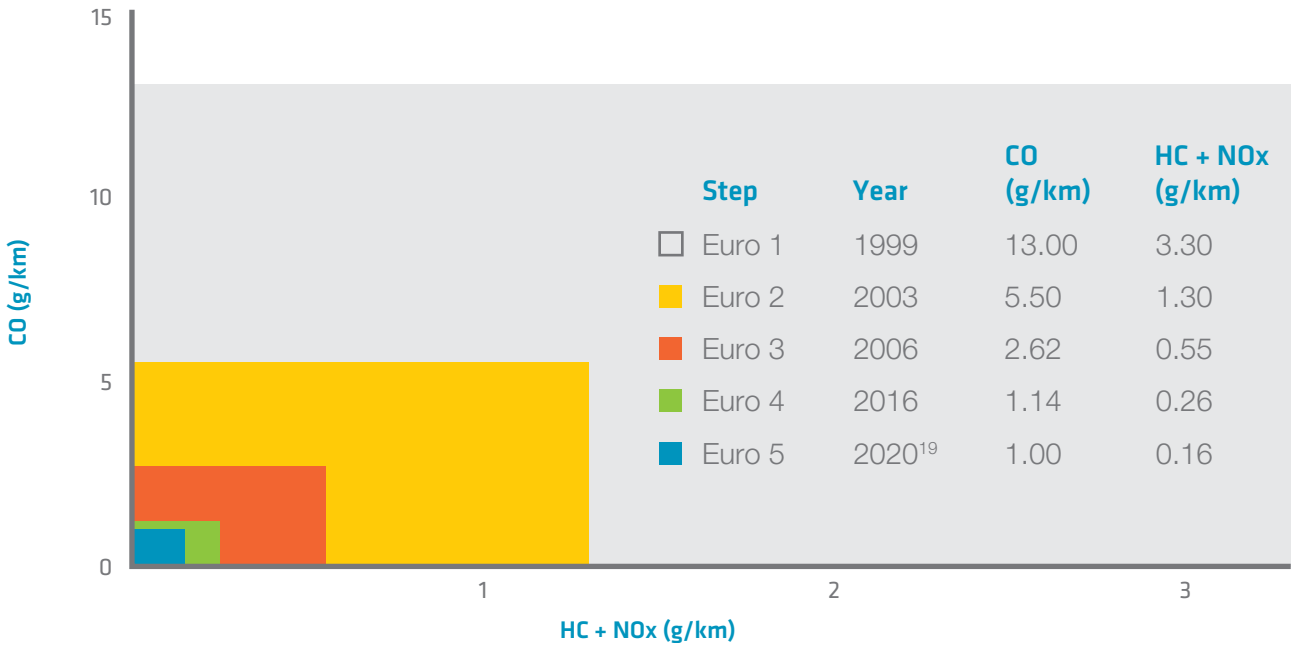
- CO (carbon monoxide)
- HC (hydrocarbons)
- NOx (oxides of nitrogen)
- NHMC (non-methane hydrocarbons)
- PM (particulate matter)

This is done through a new set of environmental standards. The standard 'Euro 4' will apply to L3e (motorcycles), L4e (motorcycles with sidecars), L5e (tricycles), L7e (heavy quadricycles) as for 1 January 2016. Euro 4 will apply to L1eB (two-wheeled mopeds), L2e (three-wheeled mopeds) and L6e (light quadricycles) as of 1 January 2017. Existing vehicles will be allowed an extra year to comply with these new standards.

Emission reduction process for motorcycles

The sector has made considerable progress in terms of reduction of polluting substances.

The table below illustrates the emission reduction process for motorcycles.



Step	Year	CO (g/km)	HC + NOx (g/km)
Euro 1	1999	13.00	3.30
Euro 2	2003	5.50	1.30
Euro 3	2006	2.62	0.55
Euro 4	2016	1.14	0.26
Euro 5	2020[19]	1.00	0.16

19 Subject to a confirmatory study

The environmental study foreseen in Regulation 168/2013

Regulation 168/2013 mandates the Commission to carry out a “comprehensive environmental effect study” by 31 December 2016 to assess whether or not to introduce the Euro 5 standard for L-category vehicles as of 2020.

Important issues regarding this environmental study need further clarification. ACEM strongly believes that this analysis must carefully examine the cost/benefit ratio for the Euro 5 step for the different types of L-category vehicles.

Firstly, it is necessary to understand whether it is technically feasible. Secondly, the cost/benefit ratio for Euro 5 must be analysed.

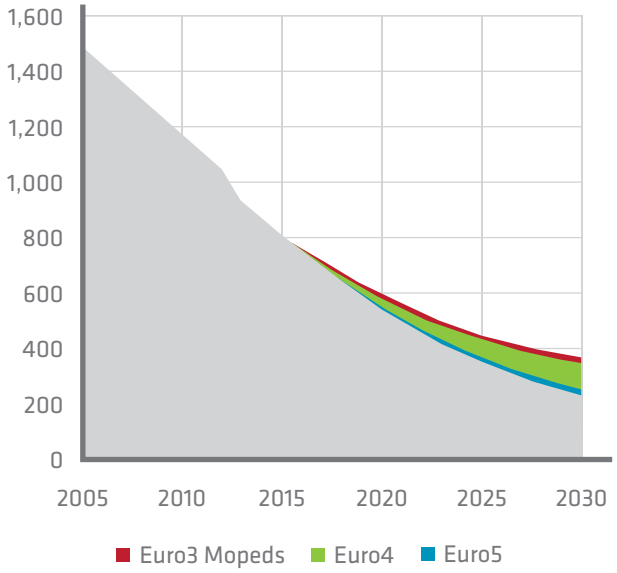
These are critical points for the industry. A previous analysis carried out by the Laboratory of Applied Thermodynamics (LAT) at Aristotle University of Thessaloniki, Greece, suggests that although Euro 3 and Euro 4 brought considerable environmental benefits, that might not be the case for the Euro 5 step.

Under the Euro 5 standard, as usual when new standards are introduced, many vehicle components, including engines, would need to be modified or re-designed. This would require further investments, as well as a reasonable lead-time for implementation.

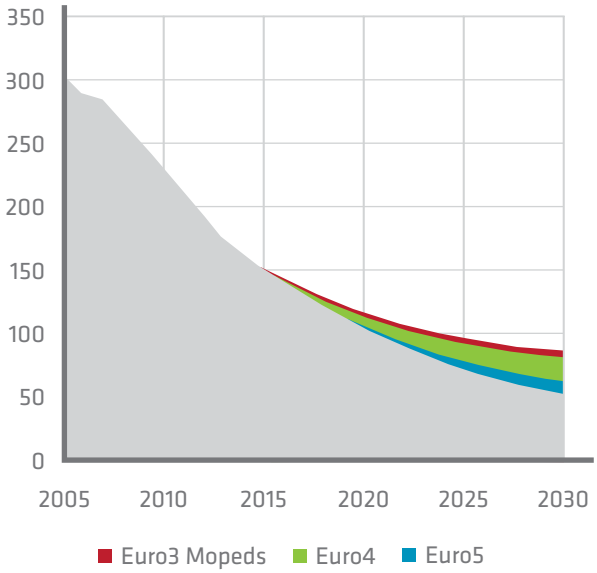
The implementation of advanced technologies - e.g. engine and exhaust after-treatment technologies - has allowed the motorcycle industry to drastically reduce pollutant emissions.

An analysis by the Laboratory of Applied Thermodynamics (LAT) at Aristotle University of Thessaloniki strongly suggests that the Euro 5 step might bring less environmental benefits than Euro 4 and Euro 3.

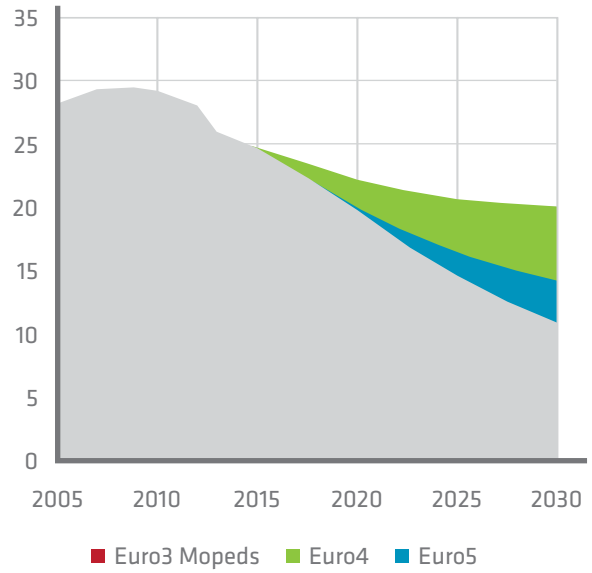
CO L-Vehs



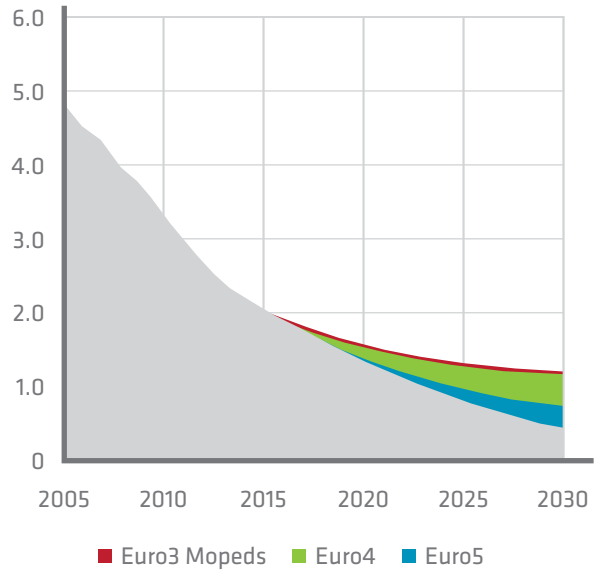
CO L-Vehs (Exh+Evap)



NOx L-Vehs



PM Total



Supporting the work of policy-makers

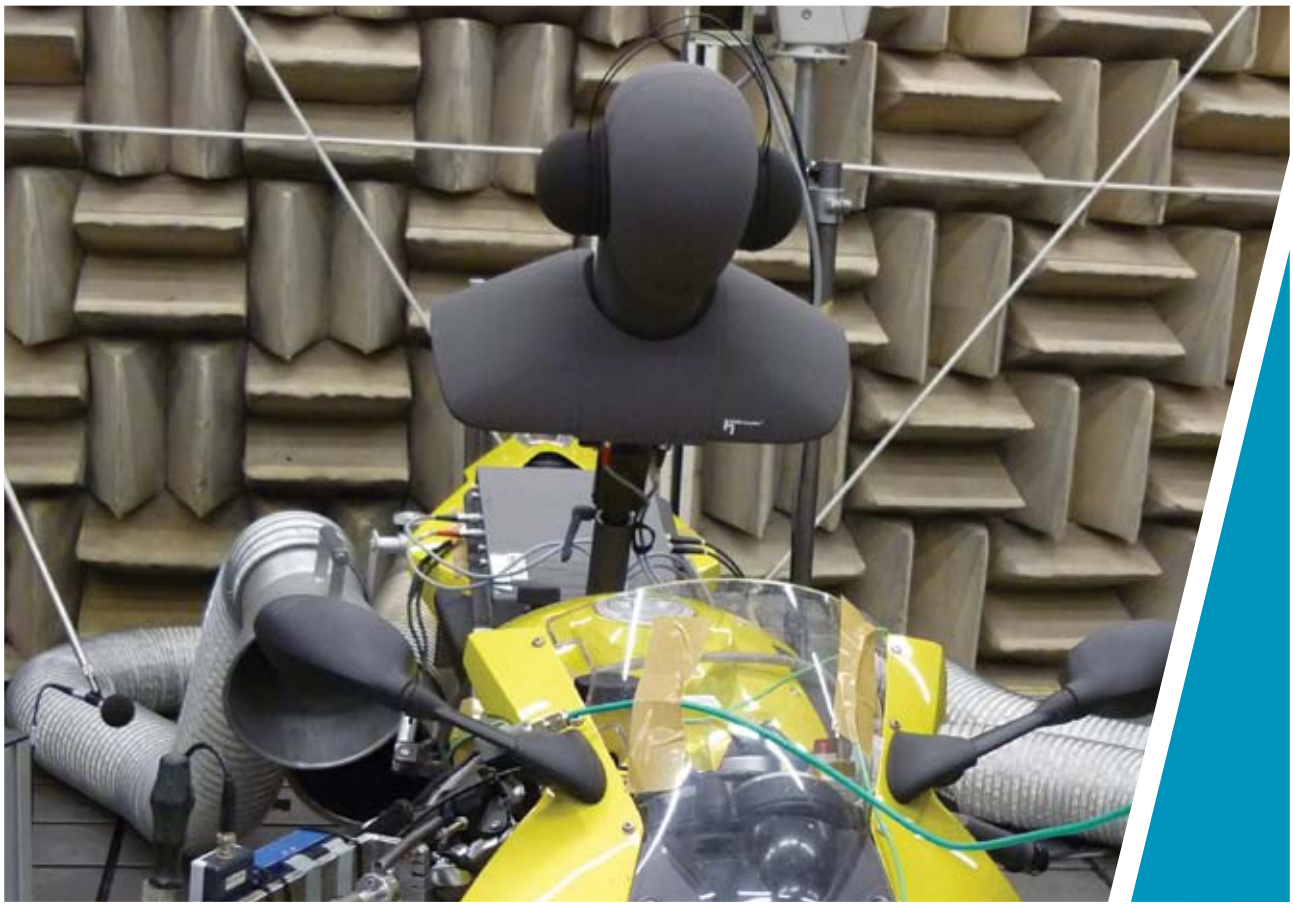
The motorcycle industry has engaged in discussions with the Directorate-General for internal market, industry, entrepreneurship and SMEs, as well as with the Joint Research Centre. The industry endeavours to supply the vehicles and test data necessary to support the 2016 study, as well as to provide the technical assistance that might be required.

In any case, since this study has not yet been completed, it is not clear whether the Euro 5 step will apply to all L-category vehicles. This situation creates considerable uncertainty for the industry and makes production planning extremely difficult.

ACEM expects that the 'comprehensive environmental effect study' foreseen by Regulation 168/2013 will follow the principles of 'smart regulation', along the lines of a fully-fledged impact assessment. Moreover, the previous impact assessment leading to Regulation 168/2013 was carried out taking as a basis pre-crisis EU market volumes. These have reduced by almost 55% between 2007 and 2013.

The market reduction has been putting high pressure on manufacturers' R&D, and making return on investment highly challenging. This new market reality raises substantial questions regarding the cost-efficiency of Euro 5, and renders an in-depth investigation of its effects furthermore necessary, considering each category's technical and market realities.

ACEM strongly believes that new requirements must be introduced within a reasonable timeframe, and it must be demonstrated that they are cost-efficient.



Under Regulation 168/2013 new environmental requirements and a new testing method for sound emissions are introduced.

How does testing work?

There are several procedures for measuring vehicle emissions for regulatory purposes. One of the most commonly used is the so called World-harmonised Motorcycle Test Cycle (WMTC), which was developed by emission and testing experts at the United Nations Economic Commission for Europe.

WMTC tests are run by specialised emission laboratories which have certified measuring equipment. Exhaust gas flow is collected in bags while the vehicle is tested on the engine dynamometer. The contents of the bags are analysed at the end of the test and the test results must be below the legal emission limits.

The need for robust testing methods

Testing methods used to type-approve vehicles in the EU must be robust, provide reliable information on emissions and reflect vehicles' real driving dynamics.

This is why the diversity of L-category vehicles must be taken into consideration when developing testing methods. The Worldwide Harmonised Motorcycle Test Cycle (WMTC), which was developed on a scientific basis by the UNECE, reflects real world riding patterns and provides an excellent way to assess the environmental performance of L3 vehicles.

Under Regulation 168/2013, a modified version of the WMTC will become a single emission laboratory test for all L-category vehicle categories as of 2020. This raises some important technical issues which need to be addressed carefully.

ACEM is ready to support efforts of European decision-makers in order to develop adequate testing solutions that take into account the real use of vehicles.

Addressing evaporative emissions for mopeds and motorcycles

Evaporative emissions from L-category vehicles is another area where the motorcycle industry provided technical support to the European Commission. ACEM proposed an effective test procedure to measure evaporative emissions from fuel tanks. This test was subsequently included by the European Commission in Regulation 168/2013.

Furthermore, ACEM is currently assisting European Commission officials to develop a Global Technical Regulation (GTR) on evaporative emissions. This new GTR will most likely be ready around 2016. Once this standard is ready, it should be incorporated into European law in order to increase international harmonisation, reduce testing and approval complexity and protect consumers.

On-board diagnostics systems

Simply put, OBDs are monitoring systems able to identify and inform the user about vehicle malfunctions that reduce vehicles' environmental performance. In such cases they store this information in a computer memory. The progressive introduction of OBD I systems on L-category vehicles except mopeds, was fully supported by the motorcycle industry.

Cars currently have “OBD II” systems, an enhanced standard designed to allow sensors and trouble codes to be read in real time by using a scan tool. It is unclear, however, whether car technology provides for robust monitoring in mopeds and motorcycles.

Some of the technical challenges associated with OBD II in L-category vehicles include difficulties to detect engine misfire, incorrect detection of failures (also called ‘false detections’), difficult placement of the catalyst monitor in the vehicle (due to limited size available on PTWs), decreased power and bad drivability, among others.

Furthermore, from an economic point of view, the cost-benefit ratio of such systems still needs to be determined. This is one of the issues at which the upcoming European Commission’s 2016 environmental study should look at.

Durability requirements

The motorcycle industry also supported the introduction of durability requirements in Regulation 168/2013. These requirements are aimed at ensuring that emission performance is complied with over a prolonged period of time.

Durability test procedures should follow proven practices existing in other parts of the world. This approach would allow to reduce legislative complexity, and would avoid unnecessary duplication of testing for the industry.

Sound emissions from L-category vehicles

The total sound emissions motorcycles and mopeds make on the road depends on different factors. Although new motorcycles and mopeds entering European public roads undergo very stringent sound level tests, vehicles on the road can sound louder than they are originally intended to.

This is the case when people purposely modify their vehicles or use unauthorised parts. The use of illegal or non-type-approved exhaust systems drastically increases vehicles’ sound emissions.

Riding behaviour and vehicle maintenance are other critical factors. A well maintained motorcycle ridden smoothly will always be considerably quieter than a poorly maintained vehicle driven in an aggressive manner. Rider education is of paramount importance to reduce sound emissions.

Some other elements to be considered include: road surfaces, tyres, engines, powertrains, etc.

The charts below compare sound emissions from vehicles equipped with original type-approved exhaust systems (green) and with tampered ones (red).

Tackling sound emissions effectively

Traffic noise is a Europe-wide problem that must be addressed through effective and well targeted policies.

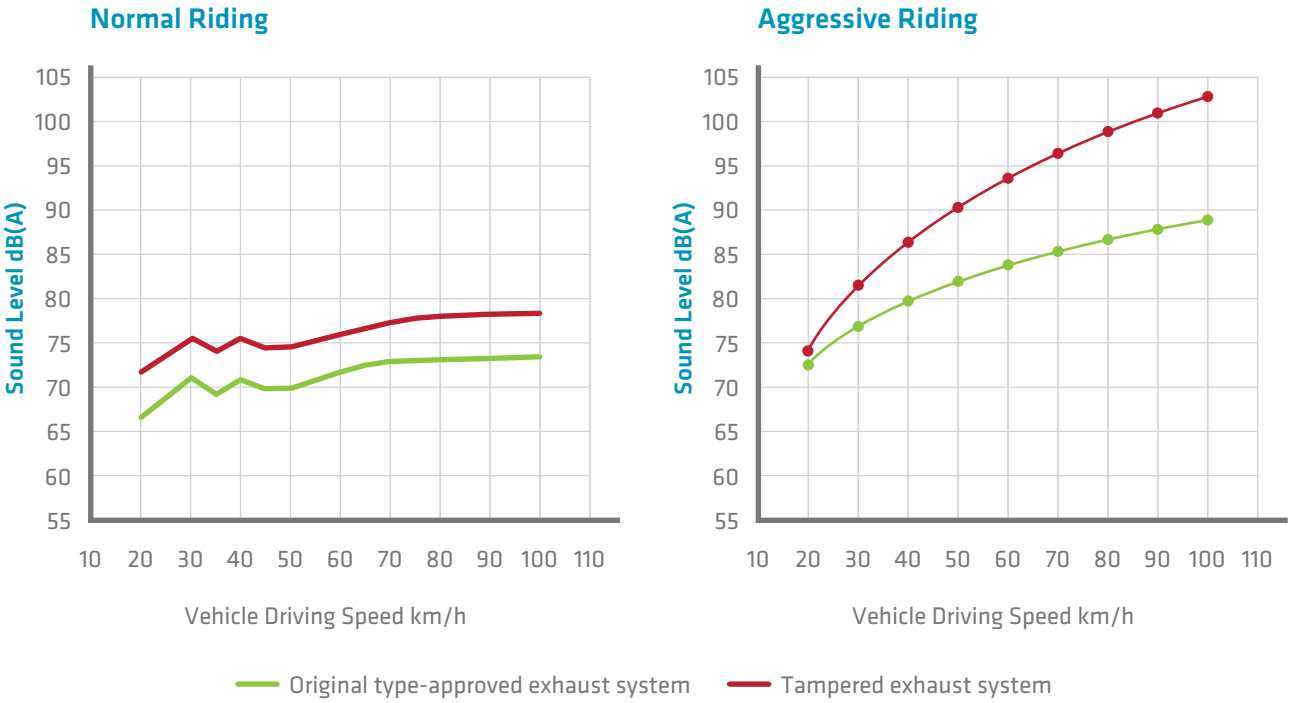
European policy-makers have already taken some steps to tackle this issue. Regulation 168/2013 and Commission Regulation 134/2014, for example, contain specific provisions on noise.

Nevertheless, in order to reach a durable solution to this issue, illegal tampering and improper use

of after-market devices must be properly addressed. This requires national authorities to implement robust road side checks and periodical technical inspections at national level.

The European Union should also accede to the relevant UN Regulations on the requirements for the replacement of exhaust silencing systems (UN Regulations Nos 9, 63 and 92).

New motorcycles and mopeds undergo very stringent sound level tests. However vehicles on the road can sound louder than they are originally intended to if they are ridden aggressively, use unauthorised parts or are not properly maintained.



New rules on periodic technical inspections of vehicles

Until recently under EU law[20] only cars and larger vehicles were subject to periodic roadworthiness tests, also called periodic technical inspections.

A new Directive adopted in 2014 will[21] require vehicles belonging to categories L3e (motorcycles), L4e (motorcycles with sidecar), L5e (tricycles) and L7e (heavy quadricycles) with an engine displacement of more than 125 cm3 to undergo periodic safety checks from 2022.

Periodic inspections and checks enhance the maintenance and repair of vehicles and increase road safety for all users. They are also an effective manner to reduce air pollutant emissions, mainly generated by older and poorly maintained vehicles. Furthermore, periodic checks discourage irresponsible tampering of vehicles.

The Directive on periodic roadworthiness tests will help to prevent safety failures due to inadequate

20 Directive 2009/40/EC of the European Parliament and of the Council of 6 May 2009 on roadworthiness tests for motor vehicles and their trailers.

21 Directive 2014/45 of the European Parliament and of the Council of 3 April 2014 on periodic roadworthiness tests for motor vehicles and their trailers and repealing Directive 2009/40/EC.

maintenance (e.g. failures or poor condition of lighting, tyres or braking systems) and to assist in the prevention of irresponsible tampering of vehicles.

The importance of periodic technical inspections

Under the new rules, those Member States with “alternative road safety measures” for these vehicles are able to use a derogation from the new Directive. These Member States must show that these measures are equivalent to the proposed inspections. ACEM notes that details on how this equivalence can be quantified have not been included in the Directive.

Moreover, today L-category vehicles are not subject to periodic safety checks in almost half of EU Member States. National authorities should introduce emission checks for older vehicles during periodic technical inspections. Checking emissions during roadworthiness tests is the most cost-effective measure to control pollutant emissions.

Moreover, all L-category vehicles should fall into the scope of the Directive. The motorcycle industry, for its part, is ready to provide technical expertise and advice to national authorities that have not introduced periodic roadworthiness tests for L-category vehicles yet.

Access to repair and maintenance information

ACEM views regular maintenance, servicing and repair as key elements to ensure that vehicles function properly and comply with safety and environmental requirements throughout their service life.

To that end, ACEM is engaged in the development of a standard for the access to technical information for the many independent operators which participate, alongside vehicle manufacturers’ networks to the proper maintenance of vehicles.

ACEM and representatives of Independent Operators work hand in hand at CEN’s technical committee 301, working group 13, to create a standard structure for websites where repair and maintenance information will be published. This should be finalised and published by mid-2016.

Repair and servicing are essential to ensure that L-category vehicles function properly and comply with safety and environmental requirements throughout their service life.

What can policy-makers do?

- Implementation times. Engines and components take several years to be designed, optimised and brought to market. Therefore, lead-times for proposals affecting manufacturing processes must be realistic and grant sufficient time for implementation.

- 2016 Environmental study. Important issues need further clarification regarding the environmental study foreseen in Regulation 168/2013. ACEM strongly believes that this study must carefully examine the cost/benefit ratio for the Euro 5 step. Previous analysis suggests that although Euro 3 and Euro 4 brought considerable environmental benefits, that might not be the case for the Euro 5 standard.

- Testing methods. Testing methods used to type-approve vehicles in the EU must be robust, provide reliable information on emissions and reflect vehicles' real driving dynamics. Consequently, the diversity of L-category vehicles must be taken into consideration in order to develop sound testing methods for emissions.

- Tackling the sound emissions challenge. Illegal tampering and aftermarket devices are two issues that require decisive action by policy-makers. National authorities should implement robust road side checks and periodical technical inspections at national level. The European Commission must encourage Member States to accede to the relevant UN Regulations on noise (UN Regulations 9, 63 and 92).

- GTR on evaporative emissions. ACEM is currently assisting European Commission officials in the development of a Global Technical Regulation (GTR) on evaporative emissions. Once this GTR is ready it should be transposed into EU type-approval legislation.

- OBD systems. The motorcycle industry supported the progressive introduction of OBD I systems on L-category vehicles. OBD II systems, however, have been designed for cars and may not provide for robust monitoring in L-category vehicles. Furthermore, from an economic point of view, the cost-benefit ratio of such systems still needs to be determined. This very important issue also must be carefully assessed in the upcoming 2016 environmental study.

- Durability tests. Durability test procedures should follow proven practices existing in other parts of the world. This will also allow to reduce legislative complexity, and will avoid unnecessary duplication of testing.