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The Motorcycle Industry In Europe

Riding in a 21st century environment

The motorcycle industry's commitment to the environment

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ABBREVIATIONS

CEN	Comité européen de normalisation / European Committee for Standardization
CO	Carbon monoxide
CO2	Carbon dioxide
EC	European Commission
ECHA	European Chemicals Agency
EU	European Union
FEMA	Federation of European Motorcyclists' Associations
GEAR 2030	High Level Group for the automotive industry
HC	Hydrocarbons
IMMA	International Motorcycle Manufacturers' Association
NOx	Nitrogen oxides
R&D	Research and development
REACH	Registration, evaluation, authorisation and restriction of chemicals
REFIT	European Commission's Regulatory Fitness and Performance programme
SMEs	Small and medium enterprises
UN	United Nations


HARLEY-DAVIDSON

INTRODUCTION

Riding two-wheelers makes an important contribution to our quality of life. Smartly integrated within a transport system, along with public and other private means of transport, motorcycles, mopeds, tricycles and quadricycles (hereinafter referred to as “motorcycles”) make possible something that we usually take for granted: efficient and sustainable mobility.

From congested super-cities such as Paris, London or Rome to the most remote places of the European Union, hundreds of thousands of European citizens use these vehicles on a daily basis to get to their jobs on time, to get back home, to move around swiftly for professional purposes or simply to enjoy the feelings and emotions that these vehicles offer. In effect, motorcycles play an important role in our modern lives: whilst police forces, paramedics and breakdown services use them in emergency situations, motorcycles are also used for the delivery of services and goods, the provision of leisure and tourism opportunities, and are a good solution to reduce congestion levels in urban and peri-urban environments and to compensate for the lack of public transport in remote areas.

Over the last decades motorcycles have achieved remarkable progress in enhancing their environmental performances. Through manufacturers’ continued R&D investments, today’s motorcycles have better fuel efficiency levels than in the past. Vehicle emissions - including sound levels - have also been drastically reduced over the years, while the improvement of gasoline engines and the launch of new electric and hybrid models in the market clearly show that the industry is committed to making a valuable contribution to the environmental sustainability of Europe’s transport systems.

The aim of this paper is to present how the industry views the role of its products in enhancing the environmental sustainability of transport and how it contributes to achieving this goal, when it comes to pollutant emissions, climate change, noise levels and the controlled use of hazardous substances, the fundamental pillars of environmental sustainability. Beyond the strict rules applying to the manufacturing of vehicles, notably in terms of homologation, this paper will also address the role of consumers and the wide array of aftermarket operators, in ensuring the environmental compliance of motorcycles over time.

As more and more people move to cities congestion is becoming an increasingly worrying problem across Europe.

1. REDUCING POLLUTING EMISSIONS AND SUPPORTING CLIMATE CHANGE MITIGATION

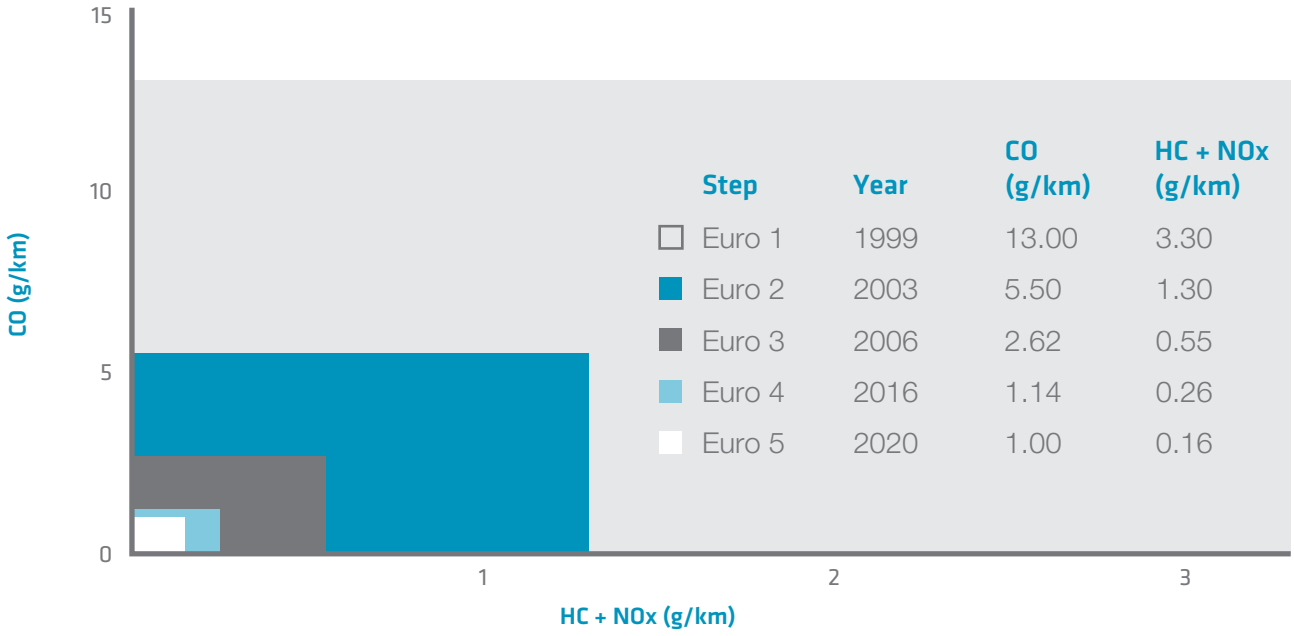
Air quality, notably in urban environments, is of major concern for citizens and policy makers alike. While mobility is a key enabler of growth and prosperity, its sustainable facet has become fundamental. Recent findings[1] support that the adverse health effects due to air pollution (ultra-fine particles, particulate matter mass, ozone, nitrogen oxides, etc.) close to major roads are larger than those resulting from general pollution in urban areas. Population living and working close to major transport infrastructure may be at risk due to increased levels of air pollution.

In terms of climate change, transport is responsible for about a quarter of EU greenhouse gas emissions making it the second biggest greenhouse gas emitting sector after energy. Road transport alone contributes to about 17% of the EU's total emissions of carbon dioxide (CO2), the main greenhouse gas. While greenhouse gas emissions in other sectors decreased by 15% between 1990 and 2007, emissions from transport increased by 36% during the same period. The importance of the sector has meant that the decarbonisation of road transport is challenging, an issue within which the use of motorcycles can be an asset.

Reducing pollutant emissions: a giant leap forward

Since 1999, in the course of the development of the "Euro steps", the reduction process between Euro 0 and Euro 3 achieved a considerable 94% reduction of carbon monoxide and hydrocarbon emissions, and a 50 % reduction of nitrogen emissions. Moreover, this drastic reduction in the limit values has been coupled with more severe test cycles.

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	1.00	0.16

1 Development of a methodology to assess population exposed to high levels of noise and air pollution close to major transport infrastructure - Entec UK Limited for the European Commission (2006 Report)

For the industry, this emissions reduction process has been driven by a series of innovations such as the 2-way oxidation catalyst, secondary air injection, 3-way catalyst with oxygen sensor control, electronic engine management, and fuel injection, among others. These technologies are now available in a wide range of vehicles, thus enhancing their environmental performance.

Since 1 January 2016 new types of motorcycles have been reaching the next stage: Euro 4. The introduction of this stage was supported by ACEM at the time of the development of a new set of vehicle homologation rules[2] introduced in a completely revamped type approval framework. This was done in order to ensure independent and rigorous checks throughout vehicles' lifecycles. This is a major step forward that will bring the environmental performance of motorcycles to a level similar to that of Euro 5 cars.

A Euro 5 stage for motorcycles is also pencilled in for the homologation regulation package. This stage is set to become applicable from 2020 and introduces pollutant emission levels equivalent to Euro 6 for cars.

At the time of the Regulation adoption by the Council and European Parliament, the Euro 5 stage for motorcycles was not backed-up by a thorough cost-benefit analysis by the European Commission. This led to a new assessment of the proposed rules in 2016 and 2017. The EC carried out an 'Environmental Effect Study' of the legislation to assess its future merits and its true challenges. ACEM has supported this study as the costs induced for certain elements of the Euro 5 package and for certain vehicle categories had, in 2013, already been deemed too high in comparison to the expected benefits. For many technical items this has proven to be the case.

ACEM is now pleased to see that part of the legislative technical requirements will now be adapted to truly reflect industrial capacities and economic realities while ensuring the application of a strong Euro 5 package as planned as of 2020.

In recent years, the motorcycle industry has started developing new electrically and hydrogen-powered models, as well as hybrid vehicles.

2 The European Vehicle Type-Approval Regulation n°168/2013/EU

Motorcycles fit for purpose in climate change mitigation strategies

Beyond the pollutant emissions reduction requirements, the new EU homologation rules have also taken into account the general climate change action policy of the EU by introducing the requirements to measure and communicate CO2 levels of vehicles, thus enhancing consumers' awareness on this important matter and providing them with comparable data for improved choices.

Motorcycles, from an all-transport low CO2 emission point of view, are a true alternative or complement to other means of transport. Small, light and even specialised vehicles, motorcycles constitute a positive response to the constant increase in mobility needs observed throughout Europe, which cannot be fully disconnected from economic growth.

On the use side, since motorcycles take up much less space on the roads, they ease congestion, thus limiting time spent stopped in traffic and decreasing commuting and parking times. As an example, in 2012, the Transport & Mobility Leuven "Commuting by Motorcycle" study concluded that a modal shift from private cars towards motorcycles positively influences the propagation of traffic flows and traffic congestion, with a beneficial impact on emissions from overall traffic, including those of greenhouse gases.

A very recent study by the European riders' organisation FEMA[3] concluded that motorcycles and mopeds are still by far the fastest way to commute to and from urban areas. This enhanced fluidity in traffic results in a true limitation of non-efficient mobility use. According to INRIX, a data processing company, drivers in the UK alone spend on average 44 hours a year looking for a parking space., the equivalent of a full working week.

Beyond the intrinsic size/weight advantages, of today's modern conception, motorcycles are highly energy efficient and also use little raw materials and energy to be produced and shipped.

Figures confirm this, as the contribution of motorcycles to the total CO2 emission from road transport is negligible (1% in 1999 to 0.6% in 2012) as confirmed by the LAT study for the European Commission. This is a trend which should continue in the years to come.

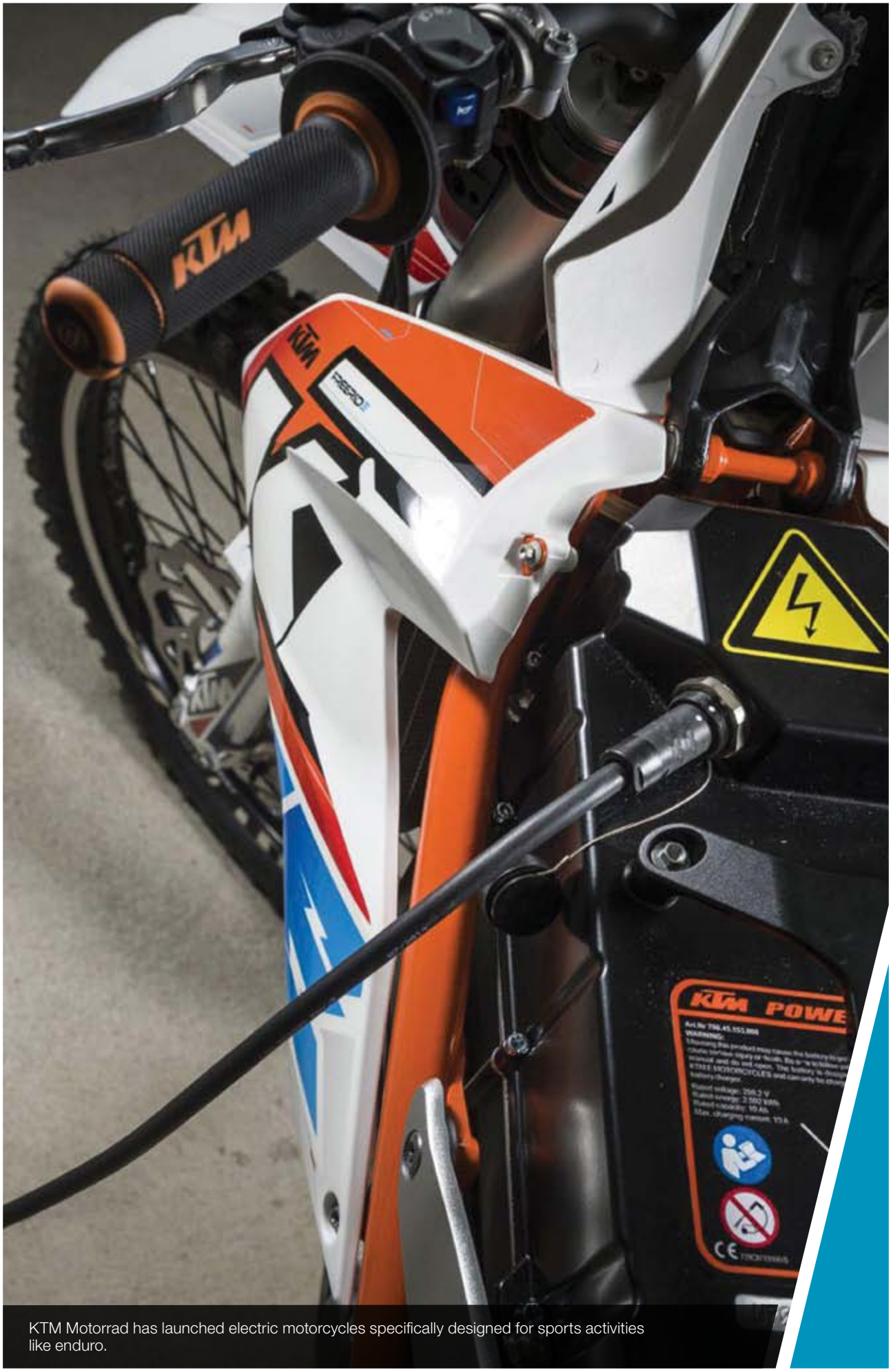
Addressing continuous environmental challenges

Research & development departments within ACEM members are also actively looking at solutions geared at addressing future environmental challenges. Many concept vehicles are being researched, and some of these vehicles can already be found in the market.

New propulsion technologies range from engines able to run on E10 biofuels, to hybrid, electric and even fuel-cell powertrains. Besides the manufacturers' investment costs, the challenge is for authorities to support the development of these technologies with appropriate infrastructure, accompanied by tax incentives in order to promote the take-up of these vehicles.

ACEM intensively participated in the work of the GEAR 2030 process, which recognises, in its latest report, the need for local, national and European decision-makers to support the industry in this way.

3 FEMA European Mobility Test 2017 (available on www.fema-online.eu)



KTM Motorrad has launched electric motorcycles specifically designed for sports activities like enduro.

2. LIMITING NOISE EXPOSURE

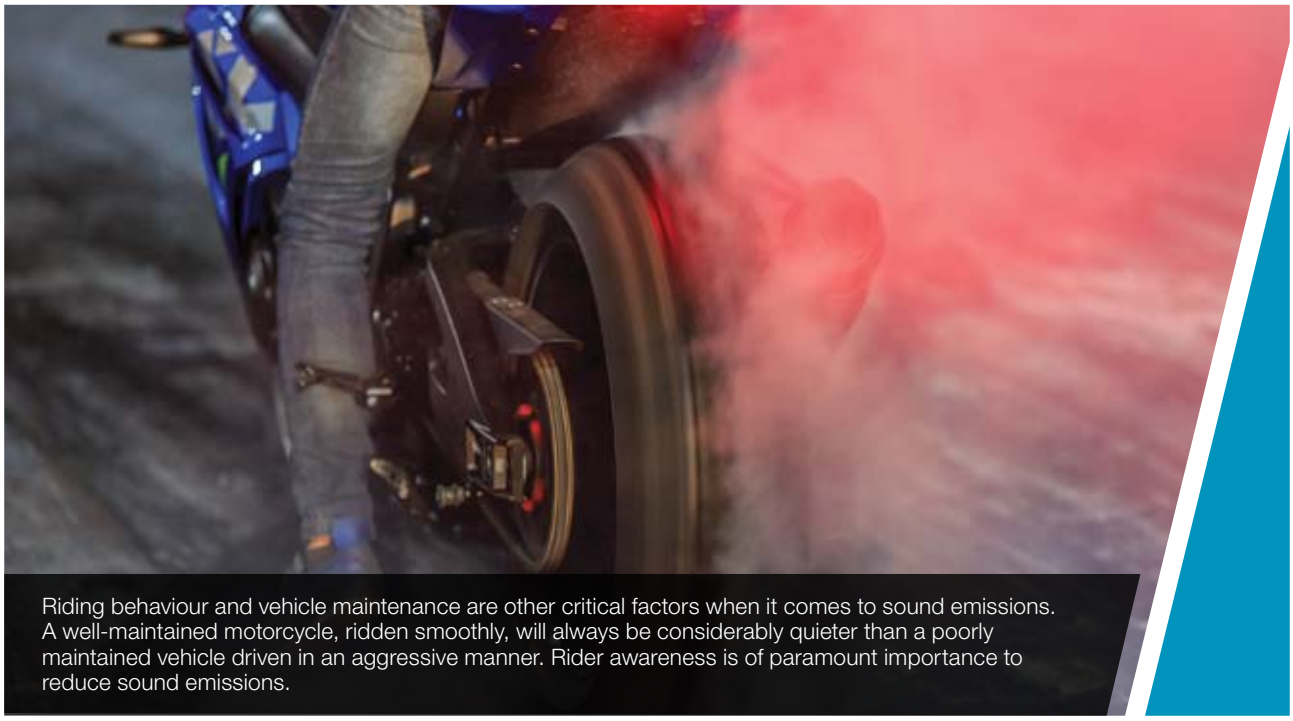
Traffic noise is often identified as one of the main sources of noise pollution and is considered by European citizens amongst the most relevant environmental and health problems, just behind air quality. Whilst many technical improvements have been made over recent years, these innovations have also been successively overtaken by the permanent growth of traffic. This can be explained quite simply by the increase in the number of total motor vehicles, the extension of road and rail networks, as well as the expansion of air transport, which also contribute to the increase in noise pollution.

Up until today, sustained economic development and traffic growth have been intimately linked. Efficient mobility is the key issue for the future of our modern society and we have to face the fact that it causes a variety of noise sources. The balance between economic growth and noise levels is therefore a Europe-wide challenge that must be addressed through effective and well-targeted policies.

Key factors influencing noise emissions

The share of motorcycles and mopeds in overall surface transport in Western Europe is on average about 3%, although the density of these vehicles is much higher in big cities. When fitted with well-maintained road legal exhaust systems, these vehicles emit similar sound levels to passenger cars. Nevertheless, the sound emissions of some vehicles are often pointed out by citizens as a disturbance.

It is true that vehicles on the road can sound louder than they are originally intended to, particularly when people purposely modify their vehicles or use unauthorised parts. The use of poorly maintained vehicles, equipped with non-street-legal exhaust systems or even greatly tampered, drastically increases vehicles' sound emissions, way beyond the regulatory limits followed by the original manufacturers.



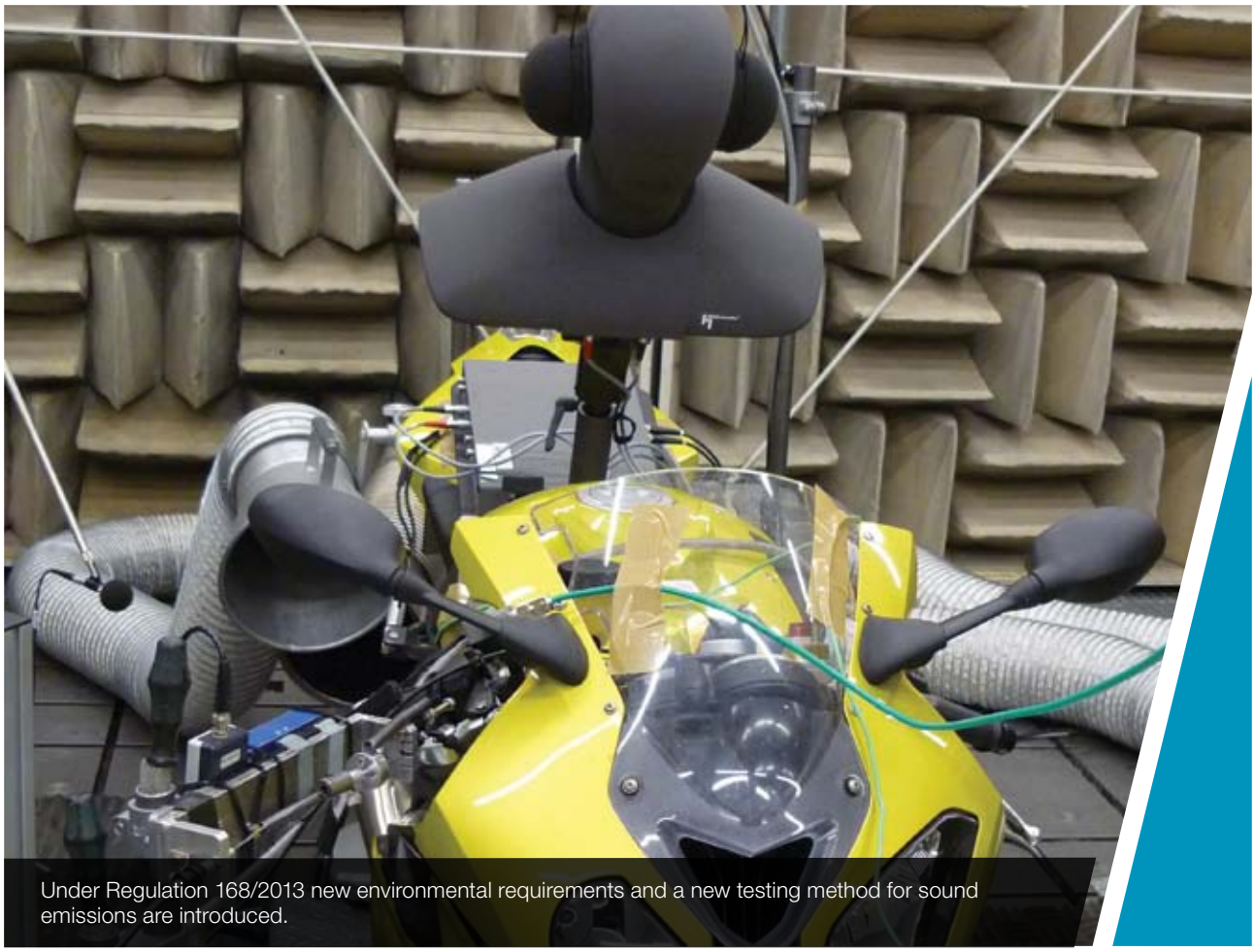
Riding behaviour and vehicle maintenance are other critical factors when it comes to sound emissions. A well-maintained motorcycle, ridden smoothly, will always be considerably quieter than a poorly maintained vehicle driven in an aggressive manner. Rider awareness is of paramount importance to reduce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

Tackling sound emissions effectively

At vehicle manufacturing level, vehicles and their original equipment exhaust systems undergo stringent type approval testing conditions as part of the vehicle homologation regime. This includes also strict anti-tampering provisions designed to ensure stable sound performance of the vehicle during its entire life.

European policy-makers, with the support of the industry, decided to implement the UN Regulation R41-04 for EU type approval of motorcycles. This Regulation contains stringent type approval testing conditions and limits for the sound emission of motorcycles. The motorcycle industry has been closely contributing to the development of these improved international test procedures for many years in close cooperation with authorities at both EU and UN level in the last years. The industry is committed to continuously improving the test provisions and adapting them to reflect technological progress.[4]

Regardless of technical feasibility and costs, a further decrease in the noise limits for new vehicles would have no effect on the road, contrary to other more effective measures. The european commission study on noise for motorcycles launched in 2017 has confirmed that reducing type approval sound level limit values will have limited environmental benefits if not accompanied by strong enforcement, market surveillance and other measures at Member State level.



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

4 The main benefits of R41-04 compared to the current EU directive: good noise performance control over the entire engine range is ensured. (e.g. 'defeat strategies' which ensure good noise performance solely within the EU directive tolerance band are clearly forbidden); improved anti-tampering provisions (inserts / add-ins / easily removable parts in mufflers are not allowed, mufflers with multiple modes (settings) have to be tested in the worst case); extra pass-by noise value to be mentioned on a plate on each vehicle in addition to already existing stationary noise value, as reference for improved road side checks.

Adequate measures on in-use performances

To reap real benefits the challenge is to find effective measures against non street-legal exhaust systems which are fitted on vehicles after they are purchased by consumers. The number of vehicles in use with these systems is very high, which essentially raises the average noise output and disturbance. The noise reduction potential of tackling this issue is thus very high, and such reductions could be obtained on a short-term basis.

ACEM as member of the International Motorcycle Manufacturers Association has also been instrumental in revising UN regulations for non-original replacement mufflers (UN R92). The improvements in this UN regulation should offer benefits for the EU market as soon as the EU accedes to it (that is to say that it accepts them as replacement for today's less demanding EU Directive). The industry views strongly believes this should happen as early as possible. Furthermore, ACEM is looking into how the current test methods and processes used for type approval could be enhanced to even better assess the sound levels of the vehicles.

Nonetheless, in order to reach a durable solution to this issue, illegal tampering and improper use of aftermarket devices must be properly addressed through enforcement at national level, by implementing robust road side checks and periodical technical inspections at national level.

Extreme example of a tampered exhaust system. In some cases, tampering can go as far as to remove completely the exhaust silencer.

Riding behaviour in peak noise disturbance

A motorcycle is only perceived as loud, due to its high acoustic potential, when it is accelerated very hard in a quiet environment. This is why noise disturbance from these vehicles is generally associated with single events and peak noise levels. These are mainly dependent on riding behaviour, such as the use of high engine speeds, and very often arise from vehicles equipped with illegal exhaust systems.

Raising rider awareness in matters of environmental protection therefore creates reasonable potential for reducing the noise load. The overall effect can be estimated at a 5 to 10 dB(A) reduction on a long-term basis.

3. CONTROLLING HAZARDOUS SUBSTANCES EFFICIENTLY

Motorcycle manufacturers use in their production a wide array of materials and substances (plastics, metals, chemical substances etc.), either as part of the final product or in the manufacturing processes as such. Managing the handling and use of these products in a safe way, at the time of production or by consumers, is an important issue for the industry.

Implementing the REACH Regulation

On the chemical management side in particular, manufacturers are subject to the application of the REACH Regulation which imposes strict rules to ensure the protection of human health and the environment from the risks that can be posed by chemicals. In line with this key regulatory framework, manufacturers endeavour to identify and manage the risks linked to the substances they use and to safely use them in their manufacturing processes, hand in hand with the other market operators of the automotive supply chain (tier suppliers) to ensure that the final complex products placed on the EU market are safe from that perspective.

Of paramount importance for the industry, REACH is one of the most complex Regulations to implement. While the manufacturers support the REACH Regulation and believe that a reduction of the risk associated with worker exposure and the environmental impact of dangerous substances is welcome in the EU market, ACEM, as many industry representative organisations in Brussels, welcomes the new European Commission's emphasis on strengthening Europe's competitiveness and President Juncker's first priority, "to put policies that create growth and jobs at the centre of the policy agenda of the European Commission"

The safe use of chemicals in manufacturing processes is a top priority for the motorcycle industry.

Maintaining the competititveness of the European industry: REFIT

Establishing the right regulatory environment and promoting a favourable climate for entrepreneurship is a matter of priority for businesses, both for major companies and for small and medium-sized enterprises (SMEs). The motorcycle industry particularly views the European Commission's better regulation policy in general and the REFIT exercise in particular as key elements of the Commission's work, which should be respected.

A greater efficiency and proportionality in the field of chemicals management would be welcome. This would contribute to maintaining the competitiveness of European businesses in a wide range of strategic sectors while fully meeting health and safety objectives.

The motorcycle manufacturers constantly monitor the evolution of the legislation and the development within REACH at ECHA level as well as the many REACH-like regulatory frameworks being designed or implemented in the other regions of the world.

The European Commission's REFIT programme aims to keep EU law simple, remove unnecessary burdens and adapt existing legislation without compromising on policy objectives.

4. ENSURING ENVIRONMENTAL DURABILITY BEYOND MANUFACTURING

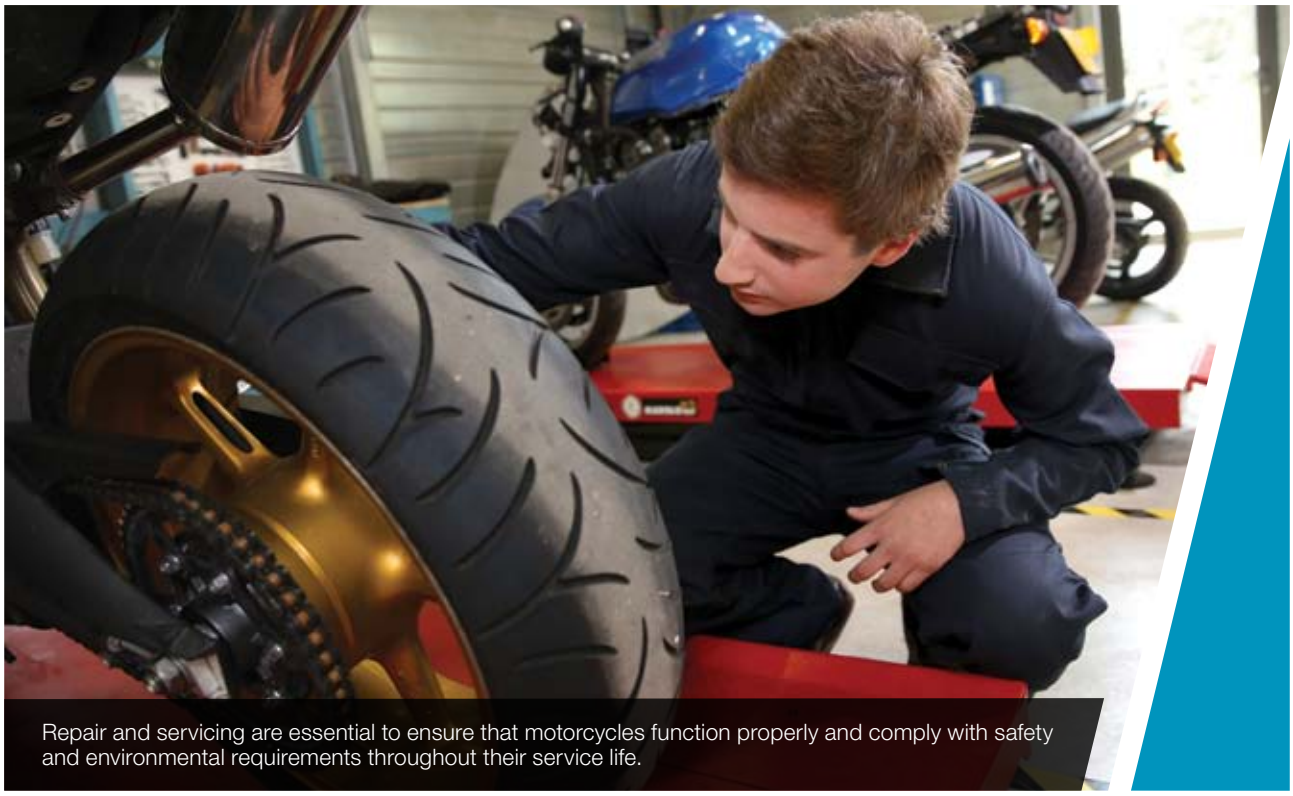
Durability and compliance with emission requirements

The motorcycle industry has supported the introduction of durability requirements in the new type approval Regulation 168/2013. These requirements are aimed at ensuring that emission performance is complied with over a prolonged period of time. At the same time, it is important that durability test procedures follow proven practices existing in other parts of the world. This approach would reduce legislative complexity and avoid unnecessary duplication of testing for the industry.

Maintenance, servicing and repair

Besides these requirements falling on the vehicle manufacturers, durability is also a principle that extends to consumers and aftermarket operators alike. ACEM and its members view regular maintenance, servicing and repair as key elements to ensure that vehicles function properly and comply with the legislation on strict environmental requirements and this 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, in 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 standard is now finalised and will be the basis for RMI implementation by the manufacturers.



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

Periodic roadworthiness, inspections and roadside checks

Until recently under EU law only cars and larger vehicles were subject to periodic roadworthiness tests, also called periodic technical inspections. A new Directive adopted in 2014 is now requiring 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 as of 2022.

Periodic inspections and roadside checks enhance the maintenance and repair level of vehicles for increased road safety but also for a sustained environmental compliance of the vehicle throughout its entire life. They are an effective manner to reduce air pollutant emissions, mainly generated by older and poorly maintained vehicles. Furthermore, periodic checks discourage irresponsible tampering of vehicles, one key aspect of the motorcycle noise perception of citizens.

ACEM has supported the introduction of this Directive, a true step forward towards more harmonisation of the issue in the EU as today motorcycles are not subject to periodic safety checks in almost half of EU Member States.

From an environmental standpoint, 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.

Periodic inspections and roadside checks enhance the maintenance and repair level of vehicles for increased road safety and sustained environmental compliance.

What can policy-makers do?

- Support the EC proposal to adjust the implementation timeline of the Euro 5 package. Following the assessment made by the European Commission in its 2017 environmental study, Regulation 168/2013 should be amended in 2018/2019. ACEM urges co-decision makers to support the Commission's proposal – expected to be released soon – to adjust the Euro 5 legislation before its application in 2020.

- Give sufficient implementation times. Vehicles, 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.

- Support innovation. Massive investments in R&D are made, notably in the field of electro-mobility. Continuous political support is needed to ensure swift transition between research and market uptake.

- Tackling the sound emissions challenge. Illegal tampering and aftermarket silencers are two issues that require decisive action by policy-makers. National authorities should implement robust roadside checks and periodical technical inspections to verify if the in-use vehicle's sound level remains equal to the stringent requirements at the time of type approval. The European Union should accede as soon as possible to UN Regulations 92 to ensure a level playing field between original and aftermarket silencers.

- Create proportionate and fit for purpose policies. The European Commission Better Regulation policy in general and the REFIT exercise in particular should always be at the core of work by policy makers to ensure that the regulatory environment - while achieving its objectives in terms of environmental protection - does not harm the competitiveness of the industry.

- Mainstream motorcycling into transport policies. Inclusive motorcycling policies should be developed by European and national policy-makers. They should recognise that motorcycles are a key means of transport, particularly in cities. They can fit in climate change mitigation strategies and therefore should be duly taken into consideration in transport planning.

5. ACEM MEMBERS

Manufacturers

BMW	BRP	DUCATI	HARLEY-DAVIDSON	HONDA	Kawasaki
KTM	MV AGUSTA	PEUGEOT SCOOTERS	PIAGGIO GROUP	POLARIS	SUZUKI
TRIUMPH	YAMAHA	KYMCO *	RENAULT *	ROYAL ENFIELD *	

*Guest Member

National Associations

AIA AUTOMOTIVE INDUSTRY ASSOCIATION	AIMID	ASSOCIATION OF MOTOR VEHICLE IMPORTERS REPRESENTATIVES	ancma	anesdor	APIA
arge2Rad	CCIAM	Chambre Syndicale Nationale du Motocycle	equal	FEBIAC	Fahrzeugindustrie
IVM Industrie-Verband Motorrad Deutschland e.V.	Polski Związek Przemysłu Motoryzacyjnego		MCRF	rai vereniging	

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