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COMMISSION STAFF WORKING DOCUMENT

IMPACT ASSESSMENT

Accompanying the document

Proposal for a Regulation of the European Parliament and of the Council

on the labelling of tyres with respect to fuel efficiency and other essential parameters and repealing Regulation (EC) No 1222/2009

{COM(2018) 296 final} - {SEC(2018) 234 final} - {SWD(2018) 188 final}

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1. Introduction

This impact assessment relates to the review of Regulation 1222/2009[1] on the labelling of tyres (hereafter the "**Tyre Labelling Regulation**" or **TLR**). It examines how the effectiveness of the European tyre labelling scheme could be improved to support cleaner, safer and quieter vehicles and to maximise its contribution to the decarbonisation of the transport sector.

1.1. Context

Lowering the demand for energy by '**putting energy efficiency first**' is one of the five main objectives of the Energy Union strategy. In 2015, Member States in the Council confirmed the imperative need to reach the 20% energy efficiency target for 2020. In November 2016, the Commission proposed to further strengthen this beyond 2020 with a 30% EU energy efficiency target for 2030[2].

In its Communication "*A European Strategy for Low-Emission Mobility*"[3] the Commission announced that by 2050 greenhouse gas (GHG) emissions from transport need to be at least 60% lower than in 1990 and be firmly on the path towards zero. Therefore, the "*Third Mobility Package*" will include initiatives to **reduce emissions** by cars and lorries, to **increase safety** of road transport and to **reduce pollution**. The EU 2030 framework for energy and climate includes a target of at least a 40% cut in domestic EU greenhouse gas emissions compared to 1990 levels.

The transport sector accounts for one third of European energy consumption. Road transport was responsible for about 22% of the EU's total greenhouse gas emissions in 2015 with a steady increase since 1990 when the share was 13%. Reducing these emissions is an acute challenge given that from 2010 to 2050 it is estimated that passenger transport will grow by 42% and freight transport by 60%[4]. Increasing the fuel efficiency of vehicles is thus a key element in decreasing transport emissions and also contributes to reducing the EU's dependence on energy imports.

The rolling resistance of tyres accounts for 5-10% of a vehicle's fuel consumption[5]. Decreasing rolling resistance is therefore important for increasing fuel efficiency and decreasing greenhouse gas emissions.

Furthermore, the Commission's Communication "*A European Strategy for Plastics in a Circular Economy*"[6] specifically mentions the need to study how to reduce unintentional release of microplastics from tyres, possibly through tyre design, minimum requirements for abrasion and information requirements.

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1 Regulation (EC) No 1222/2009 of the European Parliament and of the Council of 25 November 2009 on the labelling of tyres with respect to fuel efficiency and other essential parameters, OJ L 342 of 22.12.2009, p.46

2 This target is currently under examination in the ordinary legislative procedure: there is no sign that final agreement will be on a level of ambition lower than that proposed by the Commission.

3 COM(2016) 501 final

4 Impact Assessment accompanying the Proposal for a Directive amending Directive 1999/62/EC on the charging of heavy goods vehicles for the use of certain infrastructures, COM(2017) 276 final, https://ec.europa.eu/transparency/regdoc/rep/1/2017/EN/COM-2017-276-F1-EN-MAIN-PART-1.PDF

5 Numbers are for highway driving, https://www.fueleconomy.gov/feg/atv.shtml. City driving results in 3-5% rolling resistance loss.

6 COM(2018) 28 final

Finally, the European Union is committed to reducing noise pollution to WHO recommended levels. Given that at speeds over 35 km/h for passenger cars and 60km/h for heavy vehicles, tyre road noise is the dominant noise source[7], reducing noise from tyres is essential to tackle its health effects.

1.2. Legal framework

Recognising the importance of energy efficient tyres, the EU adopted in 2009 two sets of rules relating to tyres:

1. The TLR setting out Union requirements harmonising the information on tyre parameters to be provided to end-users allowing them to make informed purchasing choices.
2. The Regulation on type-approval requirements for the general safety of motor vehicles[8] (hereafter the "**General Safety Regulation**" or **GSR**) putting in place harmonised technical requirements that tyres must satisfy before they can be placed on the Union market.

The GSR puts in place minimum requirements for, amongst others, (i) the rolling resistance, (ii) external rolling noise and (iii) wet grip performance of tyres. These minimum requirements became applicable for all three parameters from 1 November 2012, with a second tier of more stringent requirements for the rolling resistance starting to apply on 1 November 2016 (with further requirements coming into application in 2018 and 2020).

In addition to the GSR, two other legal frameworks are particularly relevant to the TLR, relating to market surveillance and energy labelling.

As with any other product placed on the Union market, the compliance of tyres with the applicable requirements under the TLR must be checked by national market surveillance authorities. Regulation 765/2008[9] sets the framework for market surveillance by all the Member States and ensures efficient cross border market surveillance.

Although tyres are not covered under the energy labelling framework, it should be noted that this framework was updated in 2017 with the adoption of Regulation 2017/1369[10]. This introduced a number of new elements, such as a product registration database, and new rules on visual advertising and on distance and internet sales Where appropriate rules on tyre labelling should be aligned to this updated framework.

The TLR[11] relates to C1, C2 and C3 tyre types[12], as defined in article 8 of the GSR. The definition of tyre types is based on the vehicles they are primarily designed for, including

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[7] Conference of European Directors of Roads - pavements noise-reducing pavements Technical Report 2017-01

[8] Regulation (EC) No 661/2009 of the European Parliament and of the Council of 13 July 2009 concerning type-approval requirements for the general safety of motor vehicles, their trailers and systems, components and separate technical units intended therefor, OJ L 200 of 31.7.2009, p.1

[9] OJ L 218, 13.8.2008, p. 30–47. See Commission proposal COM(2017)795 for a Regulation laying down rules and procedures for compliance with and enforcement of Union harmonisation legislation on products which will replace Regulation 765/2008.

[10] OJ L 198, 28.7.2017, p. 1–23

[11] The Tyre Labelling Regulation was amended twice before it entered into application, first because industry had developed a more a new testing method for the wet grip of C1 tyres, and then to reflect the fact that a suitable international harmonised testing method of grip on wet roads had been developed also for C2 and C3 tyres: Commission Regulation (EU) No 228/2011 of 7 March 2011 amending Regulation

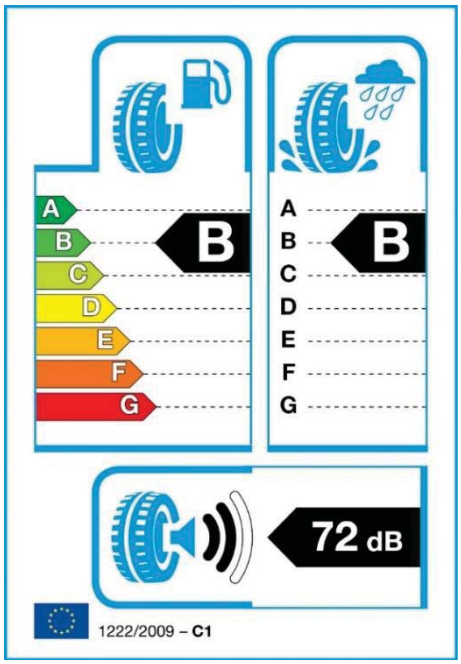
the weight and passenger capacity, and on the tyre load and speed indexes of the tyres, as shown in the table below. C1 tyres are used typically for passenger cars, C2 tyres for light commercial vehicles (LCVs) and C3 tyres for heavy commercial vehicles (HCVs).

Table 1: Definition of tyre types included in the TLR, based on the GSR

Tyre type	Designed primarily for vehicle categories	Seats in addition to driver's seat (based on vehicle category)	Vehicle weight (based on vehicle category)	Load capacity index	Speed category symbol
C1 tyres		≤8	≤3.5 t	Not applicable	Not applicable
C2 tyres		≥8	≥3.5 t	≤121	≥N
C3 tyres		≥8	≥3.5 t	≤121	≤M
				≥122	none

In the current TLR, three tyre performance parameters are specified and included on the label for C1 and C2 tyres: fuel efficiency, wet grip, and external rolling noise measured value (in dB). For C3 tyres there is no label, but information on the three performance parameters must be provided in technical promotional material.

Figure 1: Example of the tyre label for a tyre with fuel efficiency class B, wet grip class B, and external rolling noise of 72 dB (equivalent to two "soundwaves" on the scale)



The three performance parameters are interrelated. For example, improving rolling resistance can have an adverse impact on wet grip, thereby decreasing road safety. Similarly, the improvement of the wet grip might have an adverse impact on the external rolling noise, increasing noise pollution. This "contradiction" doesn't mean that the parameters of fuel efficiency, wet grip and external rolling noise cannot all be improved at the same time.

The TLR and the GSR on tyres can be seen as a "parallel" to the EU's ecodesign and energy labelling framework (which is not applicable to means of transport). Ecodesign regulations set minimum energy efficiency requirements that products must satisfy before they can be sold on the Union market, while energy labels inform the end-user of their energy consumption so that they can make informed purchasing decisions, resulting in a combined "push and pull" effect.

(EC) No 1222/2009 of the European Parliament and of the Council with regard to the wet grip testing method for C1 tyres and Commission Regulation (EU) No 1235/2011 of 29 November 2011 amending Regulation (EC) No 1222/2009 of the European Parliament and of the Council with regard to the wet grip grading of tyres, the measurement of rolling resistance and the verification procedure

[12] C1, C2, C3 tyres are legal terms defined in the Regulation (EC) No 661/2009 of the European Parliament and of the Council of 13 July 2009 concerning type-approval requirements for the general safety of motor vehicles, their trailers and systems, components and separate technical units intended therefor (OJ L 200, 31.7.2009, p. 1). They refer to tyres designed primarily for passenger cars, light commercial vehicles and heavy-duty vehicles

This same "push and pull" effect can also be seen in the EU mobility framework, where Regulations on emission performance standards set mandatory emission reduction targets for new passenger cars[13] and new light commercial vehicles[14], while the car labelling Directive helps consumers to buy or lease cars which use less fuel (and thereby emit less CO_2) and encourages car manufacturers to reduce the fuel consumption of new cars[15].

Article 14 of the TLR requires the Commission to assess its effectiveness, addressing *inter alia* the following issues:

- The effectiveness of the label in terms of end-user awareness, in particular whether the provisions of Article 4(1)(b) are as effective as those of Article 4(1)(a) in contributing to the objectives of this Regulation;
- Whether the labelling scheme should be extended to include retreaded tyres;
- Whether new tyre parameters, such as mileage, should be introduced;
- The information on tyre parameters provided by vehicle manufacturers and retailers to end-users.

To support this assessment, an independent review study was conducted in 2016[16]. The study was based on surveys and interviews targeting different actors in the tyre supply chain and market surveillance authorities with the aim to assess the effectiveness of the labelling scheme, the level of enforcement and the possibilities to improve the regulation. It included a consumer survey with 6051 car owners in six Member States[17].

Furthermore, in accordance with Article 11(b) of the TLR, the review study analysed the possibility of covering tyres designed to perform better in ice and snow conditions compared to normal tyres. An open public consultation (see Annex 2 for the results) and an evaluation (Annex 5) complemented the review study.

Based on the review study, the Commission published a Report to the European Parliament and the Council assessing the need to review Regulation (EC) 1222/2009[18]. This report concluded that certain aspects of the TLR could be strengthened or made more effective. Despite the increased tyre performance already achieved with the current Regulation, potential exists for further fuel savings as well as for increased road safety and reduced noise emissions.

2. Problem definition

Article 1 of the TLR provides that:

"*The aim of this Regulation is to increase the safety, and the economic and environmental efficiency of road transport by promoting fuel-efficient and safe tyres with low noise levels.*

13 Regulation (EC) No 443/2009
14 Regulation (EU) No 510/2011
15 https://ec.europa.eu/clima/policies/transport/vehicles/labelling_en
16 See https://ec.europa.eu/energy/sites/ener/files/documents/Study%20in%20support%20of%20the%20Review%20of%20the%20Tyre%20Labelling%20Regulation_final.pdf
17 Sweden, Finland, UK, Germany, France and Italy
18 COM (2017) 658 final

This Regulation establishes a framework for the provision of harmonised information on tyre parameters through labelling, allowing end-users to make an informed choice when purchasing tyres."

The review study showed that, in addition to the GSR, the TLR has delivered fuel savings of about 1% annual fuel consumption resulting in 170 PJ/year (and in turn CO_2 emission reductions of 12 $MtCO_2$/year), and increased tyre safety performance (around 260 fatalities avoided per year) and a slight decrease of the external rolling noise[19]. However, it has become evident that it has not fully reached the above-stated aims. The causes for the reduced effectiveness and efficiency of the label are both external and linked to the label itself. On the one hand, the 'external' factors are the relatively low awareness among end-users of the existence of the label and the inadequate enforcement of the rules by Member States' market surveillance authorities (**MSAs**). On the other hand, the factors intrinsic to the label are outdated performance classes, and inaccurate and incomplete information.

In the absence of any action, the TLR might still be able to drive the market towards more efficient, safe and quiet tyres. Nevertheless, further improvements would allow the TLR to reach its aims in a more effective and efficient manner.

2.1. Problem 1: Low visibility and awareness of the tyre label

The problem: A consumer survey[20] showed that less than half of car owners were aware that the tyre label existed. Moreover, the review study found that in some Member States[21], up to 90% of shops inspected by MSAs did not have tyres on display, as they were all in stock elsewhere. This was confirmed by the open public consultation where only 20% of respondents indicated they saw the label before purchasing tyres.

The result is that in many cases the customer is unable to see the label before buying the tyres and that therefore the label cannot perform its key function, i.e. influencing purchasing decisions.

The drivers of the problem: The low awareness of the label is caused by several factors:

(1) In brick and mortar shops[22] only about 20-30% of customers see the tyres before purchasing them; therefore most customers also do not see the label in this setting.

(2) It is not a requirement for a retailer to show the label in online shops or in other distance selling environments. This is relevant since online sales of tyres are increasing[23].

(3) Some end-users of tyres do not purchase their tyres directly, but instead through leasing contracts or as part of a fleet solution, thus not seeing the tyres or the label when purchasing.

(4) End-users of C3 tyres are only provided with the information on the three performance parameters but are not required to be provided with the label itself. As

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19 See the evaluation section in Annex 5

20 Review study, including the results of the consumer survey covering six Member States and 6051 respondents.

21 Review study (interviews with MSAs)

22 Review study (consumer survey), OPC results in Annex 2

23 According to GfK, 10-15% of tyres are sold online. The consumer survey undertaken in 2016 found that 12% of C1 tyre end users had bought them on the Internet, with 56% planning to do so in the future

a result they are provided with less easily understandable and comparable information.

(5) For tyres sold with a new vehicle (OEM tyres[24], which constitute 25% of tyre sales in the EU[25]), the TLR includes a requirement to provide information on the fuel efficiency, the wet grip and the external rolling noise classes only where end-users are offered a choice at the point of sale between different tyres to be fitted on the new vehicle they want to buy. However, in many situations end-users are not offered such a choice. In these cases, there is no obligation for the vehicle manufacturers and retailers to provide information on the key parameters of the label. This constitutes a missed opportunity for end-users to be made aware of the tyre label and to benefit from the information contained in it when purchasing tyres.

2.2. Problem 2: Compliance with the TLR

***The problem*:** Preliminary results of the MSTyr15 project on market surveillance for tyres, involving surveillance authorities from 14 Member States and Turkey[26], show that 4.2% of labels inspected were non-compliant, not visible or not available and that 15% of tyres tested for wet grip and rolling resistance were non-compliant. The 2016 Review study surveyed 14 market surveillance authorities (11 Member States and 3 from the German regions). Compliance levels varied from 25% to 100% but the numbers of inspections and tests undertaken varied greatly. Of those interviewed, only two Member States' authorities (Germany and Belgium) performed laboratory tests to check the values declared on the labels.

75% of those questioned in the consumer survey for the review study said that if their confidence in the label were higher, it would have a greater influence on their purchasing decisions.

This level of non-compliance is comparable to that found in the Commission's Evaluation of the Energy Labelling Directive[27], which estimated that 10-25% of products on the market are non-compliant with applicable requirements and that around 10% of envisaged energy savings are lost due to non-compliance[28].

The drivers of the problem: Compliance with the TLR has four main drivers:

(1) The degree of, and approach to, market surveillance varies greatly between Member States, with very few MSAs conducting laboratory tests to verify the label values[29];

(2) Limited resources and low priority for market surveillance for tyres;

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[24] OEM tyres: Original Equipment Manufacturer tyres or tyres sold with new vehicles

[25] Braungardt et al. (2014), "Impact of Ecodesign and Energy/Tyre Labelling on R&D and Technology Innovation", Link: http://www.ecofys.com/files/files/fraunhofer-ecofys-2014-impact-of-ecodesign-energy-labelling-on-innovation.pdf

[26] BE, BG, DE, EE, ES, FI, HR, IE, LT, LU, LV, PL, RO, SE, TU. For more information, see http://www.mstyr15.eu/index.php/en/

[27] SWD(2015) 143 final

[28] Ecofys, Evaluation of the Energy Labelling Directive and specific aspects of the Ecodesign Directive, June 2014

[29] The review study identified that among the MSAs of Belgium, Finland, Germany (3 Regions), Estonia, Malta, Netherlands, Sweden, United Kingdom, Hungary, Poland and Slovakia, only Germany and Belgium performed laboratory tests to verify the label values

(3) High cost and too few accredited test facilities are the main barriers for increased laboratory testing of tyres, according to MSAs;

(4) Some MSAs[30] had difficulty obtaining technical documentation in situations where the manufacturer was located in another Member State or outside the European Union.

2.3. Problem 3: Outdated, inaccurate and incomplete information on the tyre label

The problem: The set-up of the label itself suffers from three distinct flaws:

a) Outdated performance classes: The current minimum requirements of the GSR mean that it is no longer possible to sell the lowest performing tyres on the Union market. As a result, classes G and F (and E for C3 tyres) for rolling resistance, class F for wet grip and the third soundwave class for noise are now empty because tyres with corresponding performances are no longer allowed on the EU market. Additionally, the current label scheme for C1 and C2 tyres has no D class for rolling resistance and wet grip. At the other end of the scale, the top classes were already populated in 2017. This was only at the level of 1% of the tyres made available on the market for the rolling resistance, but up to 26% for the wet grip and up to 18% for noise (of C1 tyres). Based on experience of energy labelling for other product groups it may be expected that the top classes of the tyre label will become increasingly populated over the next years. This would reduce the effectiveness of the label.

b) Inaccurate information: tyre tests conducted by some MSAs and consumer organisations showed deviating results compared to the declared label values for all three performance parameters, but in particular for wet grip[31].

c) Incomplete information: The tyre label only covers fuel efficiency, wet grip and external rolling noise in 'normal' conditions. There is no information on the performance of tyres in snow and ice conditions, which is particularly relevant in the Nordic countries and in mountainous areas. This is potentially misleading for end-users, as tyres with very good level of performance under ice conditions tend to have in general low wet grip rates[32]. Retreaded tyres[33] and studded tyres[34] are not covered by the label. The label also does not cover abrasion and mileage, although this information could raise end-users' awareness in the context of the circular economy and plastics strategies.

The drivers of the problem:

(1) Outdated performance classes: the outdated performance classes are mainly caused by the banning of tyres with lower performance through the GSR, and to a lesser extent by the expected increased population of the top classes on the label.

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30 Sweden and German Regional MSAs

31 See Review study

32 The market share of these tyres at EU level is at the level of 30% of the annual C1 tyres sales for snow tyres and around 1% for ice tyres according to the review study.

33 See Review study. Tyre retreading is a process used to extend the life of used tyres, in particular for C3 tyres. The market share of retreaded C3 tyres is around 30-40 % in Europe, which corresponds to around 5 million tyres.

34 See Review study. Studded tyres are used primarily in the Finland, Sweden and Norway, where their average market share is 25 % of the C1 tyre market, and more than 50 % of car owners in Sweden and Finland have studded tyres for their car. At EU level, the estimated market share is around 0.25% of the annual sales according to the review study.

Therefore, the available scale is not fully used, reducing the impact of the label to incentivise purchasing of better performing tyres thereby making it less effective.

(2) Inaccurate information: the deviating test results are attributed by MSAs[35] to different test conditions, incorrect application of the test methods referred to in the TLR and a lack of transparency of testing conditions. The problem is most pronounced for the wet grip parameter. In addition, it is solely the responsibility of the manufacturers[36] to declare the classes on the label.

(3) Incomplete information: the incompleteness of the label stems from the TLR itself which is silent on snow and ice indications, on retreaded or studded tyres and on mileage and abrasion. For these two last parameters, the problem relates to the lack of reliable, reproducible and accurate testing procedures.

2.4. Who is affected by the problems?

Society as a whole is affected through the increased environmental impact associated with energy consumption, increased fuel costs to end-users and businesses, and negative health and safety impacts. An estimate[37] of using only tyres in the top fuel efficiency class in the EU shows potential reductions in CO_2 emissions of 47 Mt per year (corresponding to fuel savings of EUR 11 billion), which is equal to nearly 5% of the total CO_2 emissions from road transport in the EU. It could reduce fuel consumption by up to 5%, corresponding to EUR 250 over the lifetime of a set of passenger cars tyres[38].

In addition, tyre wear particles generated from the friction between the tyre and the road are released to the environment as particles of different sizes and in different amounts. Smaller particles contribute to particulate air pollution and larger particles deposit on the road and run-off into streams and accumulate in the oceans, often referred to as microplastics. According to the Commission's Communication "*A European Strategy for Plastics in a Circular Economy*"[39], it is estimated that between **75 000 and 300 000 tonnes of microplastics** in total are released into the environment each year in the EU, of which around three quarters come from tyres[40].

End-users, manufacturers and retailers are also negatively impacted by a reduced efficiency of the TLR. For instance, the review study pointed out that the disparate enforcement of the label negatively affects end-users' confidence in the information on the label, and has given retailers the impression that tyre labelling has a low priority with surveillance authorities. This undermines the effectiveness of the label and constitutes a **barrier to innovation** and market transformation. It also prevents a level playing field by putting at disadvantage manufacturers and retailers who comply with the TLR requirements compared to those who do not.

Furthermore, considering the whole lifecycle of the tyre, choosing tyres with low fuel efficiency can potentially be costlier to end-users and businesses, due to higher fuel

35 Based on interviews undertaken during the review study

36 "Manufacturers" also includes importers and authorised representatives.

37 Review study, page 13

38 See tyres labelling calculator: https://ec.europa.eu/energy/en/topics/energy-efficiency/energy-efficient-products/tyres

39 COM(2018) 28 final, http://ec.europa.eu/environment/circular-economy/pdf/plastics-strategy.pdf

40 Source: Eunomia, http://www.eumicroplastics.com/

consumption in the use phase. An estimate of using only fuel efficiency class A tyres in the EU shows an annual fuel savings potential of close to 8,5 billion litres[41].

3. Why should the EU act?

3.1. Legal basis

The legal basis for the legislative proposal is Articles 114 and 194(2) of the Treaty on the Functioning of the European Union (TFEU) on the internal market and energy efficiency respectively.

3.2. Necessity of EU action?

Action at EU level provides end-users with the same, harmonised information, no matter in which Member State they choose to purchase their tyres. This is becoming all the more relevant as the online trade increases. With a tyre labelling scheme at EU level, energy efficient and safe tyres that reduce noise pollution are promoted in all Member States, creating a larger market for such tyres and hence greater incentives for the tyre industry to develop them.

It is essential to ensure a level playing field for manufacturers and retailers as regards the information supplied to customers for tyres for sale across the EU internal market. For this reason EU-wide legally binding rules are necessary.

Market surveillance is an activity carried out by Member States' authorities. To be effective, the market surveillance effort must be uniform across the European Union, thereby supporting the internal market and incentivising businesses to invest resources in designing, making and selling energy and fuel-efficient tyres.

3.3. Added value of EU action?

A harmonised regulatory framework at EU level provides added value compared to having regulations at Member State level, because it reduces costs for manufacturers by allowing them to enter the entire EU market with only one label. This strengthens competitiveness EU-wide and facilitates easier inter-European trade of tyres, which also benefits end-users in terms of lower prices and a wider range of products.

Fully achieving a level playing field and avoiding fragmentation of the internal market, requires maintaining and improving the harmonised labelling scheme at EU level.

Increased market take-up of fuel-efficient tyres, through optimisation of the TLR, will contribute to achieving the targets agreed under the EU 2030 framework for energy and climate including the energy efficiency target[42] and the reduction of at least 40% in domestic reduction in GHG emissions compared to 1990[43].

The energy cost savings will accrue to end-users and offset the increased purchase price of higher performing tyres, leading to an overall decrease in Total Cost of Ownership

[41] Based on calculation models developed by consultants from Viegand Maagøe

[42] https://ec.europa.eu/energy/en/topics/energy-strategy-and-energy-union/2030-energy-strategy

[43] COM/2015/080 final. Communication From The Commission To The European Parliament, The Council, The European Economic And Social Committee, The Committee Of The Regions And The European Investment Bank - A Framework Strategy for a Resilient Energy Union with a Forward-Looking Climate Change Policy

(TCO) for the end-user[44]. For society as a whole the TLR provides added value in terms of safer tyres (better wet grip), through the related decrease in the number of fatalities and severe injuries in traffic accidents.

Promotion of market transformation towards fuel efficient and safe tyres is in line with the EU's aim of land transport policy, which is to promote efficient, safe and environmentally friendly mobility. Extending the labelling provisions to C3 tyres is in line with the Commission's proposal for a Regulation on the monitoring and reporting of CO_2 emissions from and fuel consumption of new heavy-duty vehicles[45].

The TLR also supports the implementation of the Energy Efficiency Directive, which requires Member State to ensure that central governments only purchase tyres (and other energy-related products) with a high energy performance (i.e. in the highest fuel efficiency class) insofar as it is consistent with cost effectiveness, economic feasibility, wider sustainability technical suitability as well as sufficient competition.

The proposed changes to tyre labelling will also play an important part in the objective of "empowering consumers" formulated in the EU Consumer Policy Strategy 2007-2013[46] , "Consumer empowerment in the EU"[47] and a "New Deal for Consumers"[48], since it will enable consumers to make an informed and better choice when buying tyres. Finally, the General Product Safety Directive 2001/95/EC[49], and in particular the Rapid Alert System on dangerous products (RAPEX), may be relevant since inadequate or erroneous tyre labelling could lead to a safety risk for consumers and could be notified in RAPEX.

4. Objectives: What is to be achieved?

4.1. General objectives

A revised TLR should pursue the following general objectives:

1) Promote **fuel efficiency** to contribute to the EU's objective to reduce energy consumption by at least 30% and domestic GHG emissions by 40% by 2030;

2) Increase **road safety** to contribute to the target of halving the number of road deaths between 2010 and 2020, endorsed by the Council of the European Union in 2010[50] and reconfirmed by European Transport ministers in a meeting in Valletta on 29 March 2017[51];

3) Decrease **external rolling noise** to reach the target in the 7th Environmental Action Programme[52] of the European Union to significantly decrease noise pollution and move closer to the World Health Organisation (WHO) recommended levels[53];

4) Promote **competitiveness** of the EU tyre industry by ensuring free circulation of compliant tyres and encourage innovation within the internal market.

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44 See the evaluation of the existing Tyre Label Regulation in Annex 5.

45 COM(2017) 279 final

46 COM(2007) 99)

47 SEC (2011) 469 final)

48 COM(2018) 183/3

49 OJ L011, 15/01/2002, p.4

50 Council conclusions on road safety, 2 December 2010, paragraph 21, ST 16951/10

51 https://www.eu2017.mt/en/Documents/Valletta_Declaration_on_Improving_Road_Safety.pdf

52 http://ec.europa.eu/environment/action-programme/

53 http://www.euro.who.int/en/health-topics/environment-and-health/noise/activities/development-of-who-environmental-noise-guidelines-for-the-european-region

There are synergies between these objectives. Reducing fuel consumption (e.g. by reducing rolling resistance of tyres) leads to lower CO_2 and other pollutants emissions. Tackling the problem at EU single market level safeguards and enhances the efficiency and effectiveness of the current EU measure while ensuring the free circulation of products within the internal market.

4.2. Specific objectives

The specific (sub) objectives that flow from the above-mentioned general objectives are:

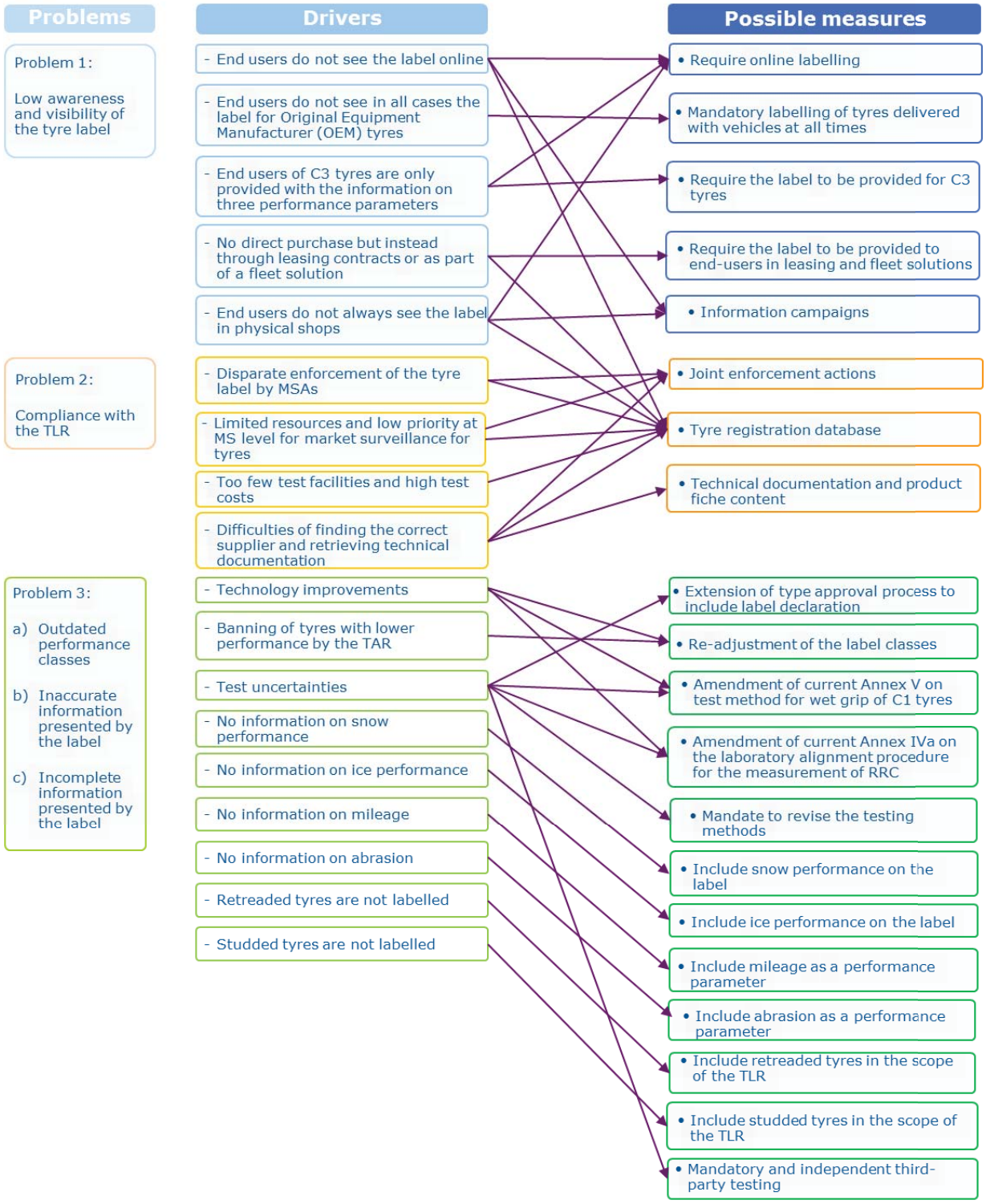
1) Raising the profile of the tyre label by *inter alia* (i) making sure that tyre label is shown at all times when tyres are sold; (ii) completing the tyre label to include snow and ice tyres; and (iii) aligning, where appropriate, with the energy labelling framework.

2) Improving end-user's trust in the tyre label by *inter alia* (i) ensuring that the tyre label is adequately enforced; and (ii) improving test standards.

The TLR can contribute to achieving the general and specific objectives mentioned above to a larger extent than it currently does (see Annex 5 on evaluation), by addressing the problems defined in Section 2.

The table below provides an overview of the relation between problems, drivers and possible measures. Section 5.2 explains the different measures in more detail.

Table 2: Overview of the relation between problems, drivers and measures



5. What are the available policy options?

The procedure for identifying policy options (POs) follows from the Better Regulation Toolbox methodology[54]. Specific measures in the POs are the result of a combination of initiatives mentioned in the Review study, the evaluation in Annex 5, the open public

54 https://ec.europa.eu/info/sites/info/files/file_import/better-regulation-toolbox-17_en_0.pdf

consultation in Annex 2, the Inception Impact Assessment[55], and inspiration taken from the Ecodesign Directive[56] and the Energy Labelling Framework Regulation[57].

The measures have been linked to the policy options in the next table.

Table 3: Modelled options

Policy options and sub-options	**Description**
PO1 (BaU)	Baseline – Business as Usual. How the market would develop without changing the current regulation
PO2	Non-regulatory measures 1. Information campaigns 2. Joint enforcement actions 3. Mandate to revise/develop relevant testing methods (e.g. abrasion)
PO3	Targeted legislative actions 4. Online labelling 5. Mandatory labelling of tyres delivered with vehicles at all times 6. Require label to be provided for C3 tyres 7. Require label to be provided to end-users in case of purchase through leasing contracts or as part of a fleet solution 8. Mandatory inclusion of snow performance on the label 9. Mandatory inclusion of ice performance on label 10. Re-adjustment of the label classes 11. Tyre registration database 12. Technical documentation and product fiche content 13. Amendment of current Annex V on test method for wet grip of C1 tyres 14. Amendment of current Annex IVa on laboratory alignment procedure for the measurement of Rolling Resistance Coefficient (RRC) 15. Extension of the type approval process to include label declaration
PO3B	As policy option 3, but without re-adjustment the label classes
PO3C	As policy option 3, but without the extension of the type approval procedure to the declaration of the label values
PO3|D	As policy option 3, but without online labelling
PO3E	As policy option 3, but without the tyre registration database
PO3F	As policy option 3, but without the effect of further OEM requirement
PO4	Policy option 2 + option 3. Non-legislative measures and targeted legislative actions are all applied
PO4B	As policy option 4, but without re-adjustment the label classes
PO4C	As policy option 4, but without the extension of the type approval procedure to the declaration of the label values
PO4D	As policy option 4, but without online labelling
PO4E	As policy option 4, but without the tyre registration database
PO4F	As policy option 4, but without the effect of further OEM requirement

Section 5.2 describes the specific measures in each option in more detail.

5.1. What is the baseline from which options are assessed?

In the baseline, the current TLR and all other relevant EU-level and national policies and measures are assumed to continue, including the GSR. This baseline will be referred to as BAU[58] (Business As usual) or 'no-action' scenario.

55 https://ec.europa.eu/info/law/better-regulation/initiatives/ares-2017-3509962_en
56 http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32009L0125&locale=en
57 http://eur-lex.europa.eu/eli/reg/2017/1369/oj

The base cases include the Original Equipment Manufacturer (OEM) tyres sold with new vehicles for each tyre type.

So far, tyre labelling has been able to transform the market in a positive direction for all the performance parameters included in the label, even though the effect on the noise level is less clear (see the Evaluation report in Annex 5). There is still room for the label to drive the market because the market share of tyres with the best fuel efficiency class A is still low (less than 1% of the tyres sold), but due to the problems described in Section 2, the full potential is not reached in the baseline scenario.

5.2. Description of the policy options

5.2.1. Option 1 – No action

PO1 (as described above) forms the baseline for the impact assessment of the other options.

5.2.2. Option 2 – Non-regulatory measures

PO2 is based on the outcome of the review study, which shows a need to improve end-users' knowledge of the label. Indeed, the consumer survey showed that only around half of the respondents were aware of the label before taking the survey.

5.2.3. Option 3 – Targeted legislative measures

Article 11 of the TLR empowers the Commission to adopt implementing acts to amend and adapt the TLR to technical progress. The scope of the article could be expanded to changes to the label itself. Therefore, inclusion of the snow, ice, mileage and abrasion performance, and re-adjustment of the label classes would be achieved *via* delegated acts.

Delegated acts are the appropriate instrument as Article 11 refers to amending non-essential elements and supplementing the Regulation, which is what delegated acts under Article 290 of the Treaty on the Functioning of the European Union are designed for.

The majority of the targeted legislative actions would take the form of amendments to the current TLR and/or its annexes, as a part of the current revision. A further amendment that should be considered is reinforcing the requirements of the TLR on penalties and enforcement.

5.2.4. Option 4 – Non-regulatory measures and targeted legislative measures

Details of the measure under Options 2 and 3 are set out below.

Option 2 - Non-regulatory measures (see above 5.2.2.)

1. Information campaigns

Target groups. In their replies to the consultation carried out for the review study, tyre manufacturers, retailers and consumer organisations recommended organising promotion campaigns to increase end-users' knowledge of the label and explain its meaning. The

[58] As opposed to BAU0, which refers to the baseline without any regulation in place, i..e before the current regulation.

target groups should be end-users in the C1, C2 and C3 tyre segments. However, awareness campaigns targeting end-users of C1 tyres are considered the most important because they constitute the largest share of tyre sales. Moreover, information campaigns should target tyre retailers, with efforts focused on (but not limited to) the development of educational tools such as brochures, short videos, webinars, etc. Guidance could be developed in cooperation between Member States and retail organisations and be supported by the European Commission. Tools for retailers could partly build on information material developed for end-users, providing them with a basis to inform end-users about the label parameters.

Geographic scope and initiators. The awareness campaigns should be run at national level by Member State authorities, at EU level by the Commission, or both. It would be an advantage to include tyre manufacturers and retailers in the campaigns to reach end-users more effectively. Some Member States have already facilitated awareness campaigns about the tyre label or plan to do so. Experiences and recommendations from these campaigns should be taken into account.

Media scope. The activities could be carried out through several different media such as television, posters in the public space, internet banners, social media campaigns, etc. They could be undertaken either at national and/or EU level and include stakeholders such as Member States, consumer organisations, manufacturers and retailers.

Awareness campaigns could include a reference to the fuel savings calculator on the Commission's website[59] that allows end-users to calculate their potential fuel savings from tyres. In addition, the Commission could support activities with regard to cooperation and exchange of best practices, including recommending common key messages.

53% of respondents to the OPC thought that awareness raising campaigns by Member States or business would be useful to increase consumer knowledge of the tyre labelling scheme.

2. Joint enforcement actions

The aim of joint enforcement action is to foster cooperation as well as exchange of information and experiences between MSAs to extend and improve market surveillance and enforcement of the tyre labelling in the EU. This measure is intended to alleviate the problems mentioned by MSAs that the test costs are high that there are too few test facilities.

The activities envisaged under this measure would be the following: [60]

– Enhance EU level cooperation – share plans and results between MSAs, and adapt results among individual countries;
– ADCO group[61] – encourage MSAs to participate in the ADCO for labelling of tyres. The group discuss market surveillance issues for tyres with the aim to ensure efficient, comprehensive and consistent market surveillance;

[59] Tyres Labelling Calculator: Savings are based on the energy efficiency performance of the tyre and on the number of kilometres that the set of tyres can run.

[60] Recommendations partly taken from the "Evaluation of the Energy Labelling Directive and specific aspects of the Ecodesign Directive (http://www.energylabelevaluation.eu/eu/home/welcome)

– ICSMS[62] – encourage MSAs to publish results of market surveillance activities in the ICSMS database on a regularly basis (the database includes very few data on tyres);

– Pan-European project to increase the level of market surveillance and investigate enforcement challenges for tyres (for instance uncertainties of test results);

– An increased role of the European Commission in market surveillance including supporting the options mentioned above.

An example of a joint surveillance action is the Market Surveillance Action for Tyres 2015 (MSTyr15)[63] project. The main objective of the project is to help deliver the intended economic and environment benefits of labelling C1 tyres. This will be achieved by improving the effectiveness of market surveillance authorities through capacity-building, training and the development and use of good practice guidelines. Future projects could include more MSAs, and the extension of inspections and testing to C2 and C3 tyres.

3. Mandate to revise/develop testing methods (e.g. for abrasion)

Based on statements from MSAs and industry representatives, the review study found that the test methods for the current label parameters contain a number of uncertainties, especially for the wet grip test. Furthermore, the test method for rolling resistance is based on laboratory measurement rather than real-life driving. Moreover, test methods for parameters not currently on the label are missing, for example for mileage and abrasion. To improve the effectiveness of the TLR it is suggested to upgrade the test methods to be more reliable, accurate and reproducible. In addition, the test methods should preferably be closer to "real world" use of tyres. The latter would be a prerequisite for developing test methods related to e.g. mileage and abrasion.

The benefits of such new test methods are to obtain more reliable test results, and the possibility of including new performance parameters on the label. The drawbacks are that real-life testing might increase test costs compared to laboratory tests.

Against this background, the Commission will prepare a standardisation request to initiate development and revision of the relevant standards.

Option 3 - Targeted legislative measures (see above 5.2.3.)

4. Online labelling

This measure includes an obligation on manufacturers and retailers to show the label when tyres are offered for sale online. A similar obligation has been implemented for energy-related products covered by an implementing measure under the Energy Labelling Framework Regulation.

This measure is becoming more and more important because tyre purchases on the internet are increasing. It is expected that online tyre retail will grow to around 24% of

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61 Administrative Cooperation Groups. Informal groups of market surveillance authorities with the aim to facilitate European cooperation

62 ICSMS: the internet-supported Information and Communication System for the pan-European Market Surveillance. For more information, see https://webgate.ec.europa.eu/icsms/

63 http://www.mstyr15.eu/index.php/en/

total sales in Europe by 2023[64]. In addition, an increasingly large share of consumers uses the internet in advance to inform their choice before buying a product in a retail outlet. This development is only expected to increase or even accelerate along with mobile internet device market penetration.

Online labelling for tyres could follow the key principles set out in Regulation (EU) 518/2014 regarding labelling of energy-related products on the internet. This regulation requires that:

- The label corresponding to the advertised product must be clearly displayed in proximity to the price of the product, or;

- If the energy label is not shown, the energy class must be displayed[65], and should itself be a link to the corresponding energy label.

The design of the arrow and whether the arrow should indicate the fuel efficiency class alone or both the fuel efficiency class and the wet grip class should be investigated further.

34% of OPC respondents thought the tyre label should be shown when tyres are sold online. 56% of those replying to the consumer survey for the review study said that they expected to buy tyres on the internet in the future.

5. Mandatory labelling of tyres delivered with vehicles at all times

This measure is an extension of the current requirement to provide the label information when tyres are sold with new vehicles (OEM tyres).

Results of the review study show that only 31% of the buyers of new vehicles were offered a choice between different tyre, and only 18% were given the required information. This means *a contrario* that about 82% is not informed about the performance of the tyres on their new car.

76% of OPC respondents though the label should be provided with all tyre sales.

6. Require the label to be provided for C3 tyres

This measure is an extension of the current requirement to provide the label as such to end-users of C3 tyres. The 2008 Impact Assessment for the TLR[66] discussed whether the fuel efficiency, rolling resistance and noise parameters should apply to C3 tyres. It was argued by some stakeholders that there was no need for rolling resistance labelling of C3 tyres because they are sold to professionals who already have all the information necessary for their purchasing decision and therefore a labelling scheme would not bring any added value. This was objected to by road transport companies themselves, including their European federation, the International Road Transport Union. Furthermore, experience with other product groups (such as professional refrigeration and lighting) has shown that the comparative value and green-to-red scale of the label also have a positive impact in a B-to-B setting.

64 https://ww2.frost.com/frost-perspectives/e-retailing-tires-projected-gain-strength-na-and-eu-tire-aftermarket/

65 See for example: https://europa.eu/youreurope/business/_static/images/uploads/nestedarrow.jpg

66 http://eur-lex.europa.eu/legal-content/EN/HIS/?uri=CELEX:32009R1222&qid=1520493804540

Although C3 tyres account for only 5% of tyre sales in the EU, they consume more fuel and cover more kilometres annually than C1 tyres so the potential for fuel savings in absolute term will be higher in this market (estimated already in the 2008 IA as EUR 800 savings per year; equivalent to EUR 870 in 2017).

In 2008, the conclusion regarding the labelling scheme for C3 tyres was to make the grading available only in catalogues, websites and advertising tools as this market is addressed to professionals and it was considered sufficient to make the information available for end-users without further communication tools. In the context of this impact assessment it is appropriate to revisit that conclusion.

7. Require the label to be provided to end-users in case of purchase through leasing contracts or as part of a fleet solution

In leasing and fleet solutions, end-users driving the vehicle and/or paying for the fuel are usually not responsible for purchasing the tyres, but rather lease the vehicles including a pre-defined set of tyres. In order for end-users to know the impacts of using tyres with different performance levels, the lessor should be responsible for providing the lessee with the relevant tyre label information and the label itself in the same way that a tyre retailer is responsible for providing the information.

8. Mandatory inclusion of snow performance on the label

In the tyre labelling scheme, the wet grip index is used as a measure for safety. However, this risks misleading end-users purchasing tyres for winter conditions in two ways. First, they may believe that a tyre with very good wet grip will have a good grip on snow, which is not necessarily the case due to the varying conditions such as temperature and surface roughness, which make the tyres perform differently on each type of road surface. Second, and conversely, tyres designed to perform better on snow and ice often have a poorer wet grip than standard summer tyres[67].

The inclusion of snow and ice performance in the labelling scheme would address a safety concern and would provide more complete information to end-users, which could ultimately lead to increased label confidence, especially in Nordic regions.

This measure concerns inclusion of an icon on the label showing that the tyre has suitable performance in severe snow conditions. The proposed icon is the 3-PMSF (3 Peak Mountain Snow Flake) logo or 'Alpine symbol', which is applicable for all tyre types (C1, C2 and C3). The threshold performance that is required of the tyre in order to use the 3-PMSF logo is defined in UNECE Regulation 117[68], implemented in the EU through the GSR[69].

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67 'Summer tyre' does not correspond to a legal definition of a specific product. It refers to a normal tyre to be used preferably under non-severe wintry weather conditions. For information, there are 'all-season tyres', which also does not correspond to any legal definition and which are tyres that can be used both under summer and winter conditions according to manufacturer declaration. They are generally marked 'M+S' but do not necessarily respond to an approved 3-PMSF (3 Peak Mountain Snow Flake) certification as the legally defined 'severe snow tyre'. All these different terms of tyres ('summer' and 'all-season') correspond to manufacturer declaration, not based on further requirements or tyre performance tests.

68. Addendum 116: Regulation No. 117, " Uniform provisions concerning the approval of tyres with regard to rolling sound emissions and/or to adhesion on wet surfaces and/or to rolling resistance", United Nations, February 2014.

69 See the pictogram in OJ L 307, 23.11.2011, p. 3.

Figure 2: The 3-PMSF logo

Source: UNECE Regulation 117

There is a general agreement among stakeholders that were consulted for the review study, including C1 end-users, industry and consumer organisations, that good snow and ice grip performance should be indicated by pictograms on the tyre label to increase road safety and help end-users choose the best tyre. 59% of those questioned in the consumer survey for the review study said that it was very important to include information on snow and ice performance.

Using pictograms ensures language neutrality of the label similar to labels implemented under the Energy Labelling Framework Regulation.

9. Mandatory inclusion of ice performance on the label

This measure is very much in line with the measure on snow performance, but concerns the inclusion of a logo showing that the tyre has suitable performance on ice. Tyres with a good performance on ice are also referred to as "Nordic winter tyres". These tyres often have the lowest wet grip values on the label as ice grip and wet grip are negatively correlated, and end-users consulting the wet grip scale for assessing the tyre safety will therefore be misled by this information.

Ice performance should be implemented in the same way as the snow performance, by adding a logo on the label if the tyre lives up to a certain performance (brake or handling) on ice. An ISO standard is under development and it is expected that the standard will be ready between end of 2018 and beginning of 2019.

The expected ISO standard, in combination with a threshold value and a corresponding pictogram, seems to be a useful solution. If a redesign of the label is decided, a consumer survey should be considered to assess the effect of having *both* the snow and the ice logo on the label, as opposed to allowing tyre manufactures to only show *one* of them.

43% of respondents to the OPC thought that it should be mandatory to show information ice and/or snow performance on the tyre label, while 27% thought this should be included, but that it should be voluntary.

10. Re-adjustment of the label classes

This measure concerns re-adjusting the label to deal with the outdated performance classes while maintaining the label's potential to drive the market towards better performing tyres. The current label is no longer accurate because of the GSR banning bottom classes and the fact that for wet grip, the label has an empty class in the middle of the A-G range.

This measure does not involve a full "rescaling" of the label as envisaged under the Energy Labelling Framework Regulation for products where the top class was overpopulated and A+, A++ and A+++ classes were added. It would be similar to the

situation where a more stringent tier of requirements is introduced after a certain date in current product specific energy labelling regulations. When this happens, manufacturers have to accompany the product with the new label. There is no requirement to change the labels on products that were placed on the market prior to the change, and they are eventually all sold in the normal way.

The re-adjustment is an aspect of "future proofing" the label and would take into account the speed of the technological progress. The re-adjusted label could leave the top class empty to encourage innovation and technological progress, provide for regulatory stability and limit the need for future of re-adjustment.

In the review study, it was concluded that the level of technological development compared to the label classes, and the rate at which tyres with both an A-class for rolling resistance and wet grip are developed, does not justify a full rescaling of the label. However, the label is no longer accurate because of the GSR banning bottom classes and the fact that for wet grip, the current label has an empty class in the middle of the A-G range, and this would justify a re-adjustment of the classes.

For the current assessment, newest data was obtained from the German tyre database TOL[70] and supplemented by extrapolated sales weighted data from GfK for 5 Member States[71]. The updated data show the same results as the 2016 Review Study: the market share of tyres rated "A" in both RRC (rolling resistance coefficient) and wet grip is still less than 1% and the main constraint is the RRC. This result fits with the statement from the tyre industry that the focus is on developing tyres with better wet grip while maintaining or improving RRC *when possible*, as the two parameters are to some extent negatively correlated. It is also in line with the consumer survey where C1 end-users showed a higher focus on safety.

However, the new data shows that for the wet grip of C1 tyres, the top class is already populated at the level of 26% of the tyres made available on the market. For the three classes on external noise, the bottom class has been banned and the top class is already populated at the level of 18%. Also, for the noise there are only 2 classes, which may be too little to drive the market towards better performing tyres.

The three possible options for re-adjustment are the following:

1. Bespoke 4 classes scale so that empty classes are no longer shown;
2. Keep the current scale(s) but have some classes empty (greyed-out) to reflect regulatory requirements which mean that there are no tyres in those classes;
3. Redefine the boundaries between the current A-G classes to make them more accurate.

11. Tyre registration database

This measure concerns the establishment of a digital registration database for tyres on the EU market and a requirement for manufacturers to enter information in the database that is intended to provide relevant information to end-users, retailers, manufacturers and MSAs, and will also be a useful tool for retailers when providing the tyre label information to end-users.

70 Tyres online and Energy GmbH, database extractions from year 2012-2015, Hämmerling Group, Germany. Dataset covering 2012-2015 with 30,000 tyres total.

71 Germany, United Kingdom, France, Italy and Spain

This measure assumes the tyre label database could become part of the product database that will be set up according to the Energy Labelling Framework Regulation. That database will consist of a public (open) part and a compliance part (for MSAs), which will be accessible via an online portal. Including tyres in the database would possibly require a legislative amendment to the Energy Labelling Framework Regulation.

The responsibility of the tyre manufacturer would be to register all new types and enter pre-defined information in the database before placing the tyre on the market. The information would include details about the manufacturer and the product, for instance manufacturers name and trademark, model identifier, performance classes and other parameters on the label, the label in electronic format and the technical documentation.

As tyre manufacturers are already obliged to assemble all the required documents and information (including providing the label) and make the technical documentation available to MSAs on request, the additional costs for uploading this information in a database would be limited. The additional costs could be offset by the fact that manufacturers do not need to handle requests from the authorities because they would have easy access to the information in the database.

The burden for MSAs to obtain the documentation would be reduced. As the Commission is already obliged to set up the database for energy-related products, the extra costs for inclusion of tyres would be marginal. In the Impact Assessment accompanying the Energy Labelling Framework Regulation it is estimated that this option could increase compliance by 6% and thus reduce losses from non-compliance by 3%.

70% of OPC respondents supported a registration database and 30% of those questioned in the consumer study specifically mentioned this as an element that would improve their confidence in the tyre labelling scheme.

12. Technical documentation and product information sheet

This measure concerns inclusion of (i) a new annex in the TLR detailing the content of the new technical documentation that tyre manufacturers must make available to MSAs and (ii) an annex detailing the content of the product information sheet with relevant information for end-users.

Under the current TLR, technical documentation must be sufficiently detailed to allow authorities to verify the accuracy of information provided on the label with regard to fuel efficiency, wet grip and external rolling noise[72]. This measure would extend this requirement by including specific parameters and the order in which they should appear in the technical documentation. Furthermore, the product information sheet would mirror the current Annex III “Information provided in technical promotional material”.

This will make it easier for manufacturers to ensure that they provide sufficient documentation and for market surveillance authorities to evaluate the received documentation.

13. Amendment of the current Annex V on test method for wet grip of C1 tyres

72 Article 4 point 4 of the TLR.

In the current TLR, the wet grip index for C1 tyres must be measured according to several ASTM standards. It is proposed to change the wet grip measurement method in the TLR to ISO 23671:2015 Passenger car tyres – Method for measuring relative wet grip performance[73] (or the newest version of this standard[74]).

This standard specifies the method for measuring relative wet grip braking performance, indexed to a reference under loaded conditions for new passenger cars tyres on a wet-paved surface. The use of a reference tyre is necessary to limit the variability of the testing procedures. The ISO standard to some extent builds upon the ATSM standards mentioned in the current TLR. The ISO standard is considered the recognised state of art measurement method for tyre wet grip performance.

14. Amendment of current Annex IVa on laboratory alignment procedure for the measurement of RRC

In 2010, an 'Expert Group on laboratory alignment for the measurement of tyre rolling resistance' was set up[75]. The main activities of the group are dedicated to the creation of an alignment method for laboratories having to measure tyre rolling resistance in accordance with the TLR. In 2013/2014 and 2016/2017, the Expert Group assessed, in cooperation with a Network of Reference Laboratories[76], the stability and validity of the assigned values[77] of the reference laboratories.

The experience gained during the inter-laboratory comparison tests led the Expert Group to suggest some amendments to the Laboratory alignment procedure for the measurement of rolling resistance in Annex IVa of the TLR[78]. The amendments focus on clarifying several definitions and the general provisions of Annex IVa, and correcting the formula to calculate allowed standard deviation of the measured rolling resistance.

15. Extension of the type approval process to include the label declaration

Under the GSR the manufacturer must test tyre types either in-house or in a third party laboratory. A national type approval authority then endorses the resulting test values. Currently, the values for rolling resistance, wet grip and noise that manufacturers declare on the tyre label are based on the results of those tests. However, the declaration of those values on the label (i.e. the translation of those values into the classes of the label) is not subject to any verification and is done by manufacturers themselves (self-declaration).

This measure would require the tyre manufacturer to subject the label declaration to the type approval process. Consequently, this would add an additional guarantee of the correctness of the label.

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73 https://www.iso.org/standard/65530.html, https://www.iso.org/obp/ui/#iso:std:iso:23671:ed-2:v1:en

74 The standard is reviewed every 5 years. A new process started in 2017.

75 Members are tyre manufacturers, independent test laboratories and observes. See: https://ec.europa.eu/energy/sites/ener/files/documents/report_from_egla_expert_group_2017.pdf

76 Publication of reference laboratories for the purpose of the alignment procedure concerning the measurement of rolling resistance of tyres for the implementation of regulation No http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.C_.2012.086.01.0003.01.ENG&toc=OJ:C:2012:086:TOC

77 Assigned value' means a theoretical value of one alignment tyre as measured by a theoretical laboratory, which is representative of the network of reference laboratories that is used for the alignment procedure.

78 Report from the Expert Group on Laboratory alignment for the measurement of tyre rolling resistance under Regulation (EC) No 1222/2009

16. Mandatory and independent third-party testing

This measure would require product testing to be done by independent third-party laboratories, over and above the testing that takes place under the GSR. The current GSR requires manufacturers to test their tyres, but they are allowed to carry out the testing in in-house facilities.

Third party testing will result in extra costs for manufacturers and manufacturers who are placing products on the European market, estimated to be as follows per tyre type placed on the market:

Table 4: Overview of testing costs per tyre type

Tyre type	Test cost
C1	3,500-4,000 Euro
C2	4,000-4,500 Euro
C3	5,000-6,000 Euro

Source: ETRMA

Industry does not support introducing additional independent third party testing of tyre performance. They argue that third party testing would be disproportionate to the available infrastructure of testing institutes/type approval authorities' laboratories and create unacceptable delays and costs for the tyre industry. Instead, they propose that market surveillance and enforcement should be increased and more coordinated.

Third party testing is however supported by other stakeholders such as environmental organisations and testing labs.

17. Inclusion of studded tyres in the scope of the TLR

This measure concerns inclusion of studded tyres[79] in the scope of the TLR to make information about the tyre performance parameters available to end-users for this specific type of tyre. Studded tyres are a subgroup of Nordic winter tyres developed for sub-zero temperatures and ice and wet ice conditions. Only 'studdable' tyres supplied without studs are currently covered by the TLR. Studded tyres are also exempted from the GSR.

18. Inclusion of retreaded tyres in the scope of the TLR

This measure concerns the extension of the scope of the TLR to include retreaded tyres.

Tyre re-treading is a process used to extend the life of used tyres. When a tyre is re-treaded, the worn-out tread is replaced with a new one, which can be repeated as long as the casing integrity is guaranteed. Re-treading is particularly relevant for C3 tyres, which make up about 30% of the market share of re-treaded C3 tyres in Europe, corresponding to around 5 million tyres[80,81]. However, a decreasing trend has been seen in the C3 retreaded market from 2013-2015 due to increasing imports in the EU of low cost C3 tyres. The market share of re-treaded C1 and C2 tyres is below 2% in Europe.

[79] Studded tyres have metal studs embedded within the tread in order to increase the traction of the tyre, in particular on ice.

[80] European Tyre and Rubber Manufacturers' Association, ETRMA (2011), "Re-treading" Website last updated 2011. Link: http://www.etrma.org/tyres/retreading

[81] Ruud Spuijbroek, Secretary at Bipaver (2015), personal communication on email September 16th 2015.

19. Mandatory inclusion of mileage as a performance parameter

This measure concerns adding mileage as a new tyre performance parameter on the label. Mileage is an important parameter for end-users and various stakeholders such as environmental and consumer organisations requested adding it to the label, as shown in the annexed OPC report.

Mileage is an indication of the usable life of a tyre, based in particular on the number of kilometres that the tyre can be expected to be driven for, before it reaches the legally defined minimum tread depth.

27% of OPC respondents were in favour of including mileage as a parameter on the label, but only if the accuracy of the measurement could be ensured.

20. Mandatory inclusion of abrasion as a performance parameter

This measure concerns the inclusion of abrasion as a new performance parameter on the tyre label.

Abrasion is the removal of materials from the tyre when it interacts with the road surface. Tyre wear particles are generated from the friction between the tyre and the road. According to the tyre industry, these particles might therefore be an agglomeration of approximately equal mass fractions of material from the tyre and the road[82]. The abrasion rate is intrinsically linked to the durability and life expectancy of tyres.

Particles are released to the environment as particles of different sizes and in different amounts. Smaller particles contribute to particulate air pollution and larger particles deposit on the road and run-off into streams and accumulate in the oceans. These particles are often referred to as microplastics. The Commission's recently published EU Strategy for Plastics in the Circular Economy[83] presents key commitments for action at EU level and recognises the significant contribution of tyre wear to the accumulation of microplastics in aquatic environments. Furthermore, the Commission acknowledges the need for more research to improve understanding of the sources and impacts of microplastics[84].

21% of OPC respondents were in favour of including mileage as a parameter on the label in all circumstances, with 20% in favour only if the accuracy of the measurement could be ensured. 41% thought concerns about abrasion should be covered in other forms of regulation.

5.3. Options/measures discarded at an early stage

Inclusion of studded tyres

The market share of studded tyres is very small in all but the two Nordic Member States (Sweden and Finland) as well as Norway, and the potential fuel saving is therefore very limited. One reason for the low market share is that use of studded tyres is actually prohibited in many Member States. In addition, testing of rolling resistance and wet grip for studded tyres is not possible with the current test standards. In both the RRC and the

82 http://www.etrma.org/uploads/Modules/Documentsmanager/20171003_etrma_trwp-position-paper.pdf

83 http://ec.europa.eu/environment/circular-economy/pdf/plastics-strategy.pdf

84 http://ec.europa.eu/environment/circular-economy/pdf/plastics-strategy.pdf

wet grip tests there is a limited allowed 'roughness' of the surface (machine drums or road), and the use of studs on these surfaces during the test will damage them to such an extent that the surfaces no longer comply with the test standards. Hence, with the current test standards, including studded tyres is not possible.

Based on all of the above reasons, including studded tyres in the TLR is discarded.

Inclusion of re-treaded tyres

The performance of re-treaded tyres is determined by the combination of casing, tread, and applied re-treading process[85]. The major challenge of including retreaded tyres in the labelling scheme is the necessity to establish the three label performance parameters (fuel efficiency, wet grip and external rolling noise) for each combination of casing, tread and retreading process. Since re-treaded tyres are produced in small series, the cost of testing each combination would make the re-treading business economically unfeasible, especially for SMEs[86].

As already mentioned, the TLR does not require C3 tyres to have a label. According to the industry organisation for tyre retreaders[87], the major barrier for including re-treaded tyres in the TLR is the vast diversity of possible product combinations and small number of similar re-treaded tyres.

Based on all of the above reasons, including retreaded tyres in the TLR is discarded.

Inclusion of mileage as a performance parameter

Inclusion of mileage in the label seems to be useful for end-users and could be an important factor for tyre purchases. It is also a durability parameter that fits adequately with the objectives of the circular economy strategy. However, its inclusion on the label coupled with the inclusion of further parameters such as abrasion and snow/ice performance should be assessed cautiously to avoid overburdening the label with too much information for the end-user, thereby reducing its effectiveness. In this context, the relation with the dry grip of tyres also has be taken into account.

More importantly, inclusion of mileage is currently not feasible as there is no reliable, accurate and reproducible standardised test method for identifying the number of kilometres achievable by tyres. Such a method would have to be developed by the standardisation bodies to provide end-users with comparable information. It should also be considered that measuring mileage using a standardised test method can deviate significantly from the mileage experienced by end-users in real life (as mileage is influenced by other parameters such as weather and road conditions, driving behaviour, etc.). If this happens, it may undermine end-users' confidence in the label.

Environmental stakeholders are in favour of including mileage on the label as shown in the annexed OPC report. Some even indicated that if the measure is not included based on lack of an appropriate measurement methods, it would be necessary to initiate the standardisation work as soon as possible in order to avoid that this argument will be used also in the future for not taking action.

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85 Boustani, A. (2007), "Remanufacturing and Energy Savings" B.S. University of California Berkely, Massachusetts Institute of Technology. Link: http://web.mit.edu/ebm/www/Publications/reman-est.pdf

86 Retyre (2014), Main website. Link: http://www.retyre-project.eu/

87 BIPAVER

The industry and MSAs agree that it is not possible to measure mileage with the accuracy required for labelling, and MSAs do not consider it possible to perform market surveillance on such a requirement. Furthermore, the tyre industry, MSAs and tyre testing organisations all agree that introducing mileage as a parameter in the tyre labelling scheme would be very costly and would not help end-users choose better tyres.

However, this issue could be further investigated in a future amendment of the TLR (possibly through delegated acts), also taking into account consumer understanding testing of the future label.

This measure is therefore discarded based on the inability of meeting the criteria for technical feasibility (lack of testing method).

Inclusion of abrasion as a performance parameter

As with mileage, inclusion of abrasion in the label could be useful for end-users and thus an important factor for tyre purchases, contributing to the EU Strategy for Plastics. The inclusion of abrasion is however not feasible for the time being as there is no reliable, accurate and reproducible standardised test method for measuring the abrasion effect of tyres. Such a method would have to be developed by the standardisation bodies to provide end-users with this information.

The opinion of stakeholders regarding this measure is very much in line with their views on mileage, because the two parameters are related. As confirmed in the OPC, industry believes that tyre labelling is not appropriate for this complex question, while NGO's[88] consider it important that this information is included in the label. Given the likely high price of tyres that are well performing in terms of abrasion, the utility of including information on the release of microplastics on the tyre label needs to be carefully examined. Using the GSR to ban tyres that did not reach an acceptable abrasion level, in addition to labelling, in other words the traditional "push and pull" affect, is a future option that needs to be considered.

Due to the lack of a reliable and reproducible testing method, this measure is not technically feasible at this stage. However, given the importance of abrasion for the environment and for the durability of tyres, once such a test become available in the future, it should be made possible to adapt the label parameters under the TLR using a delegated act. To facilitate this process, the Commission could give a mandate to CEN/CENELEC to develop such a methodology.

Mandatory and independent third-party testing

For the purpose of this impact assessment, this measure is discarded for several reasons. Firstly, European product legislation (e.g. on safety or energy efficiency) is overwhelmingly based on some form of self-declaration by manufacturers and importers of the compliance of their products with the applicable requirements. This is supported by the CE marking and is based on the so-called New Legislative Framework that was introduced in 2008[89] (as an update of the New Approach to technical harmonisation that started in 1973). Resort to independent third party testing or type examination is limited to specific cases where the co-legislators have considered that the risk and consequences of non-compliance are particularly high, for example in the case of certain personal protective equipment or gas appliances. Non-compliance with the tyre labelling

[88] See the OPC report in Annex 2

[89] https://ec.europa.eu/growth/single-market/goods/new-legislative-framework_en

requirements, which could of course result in loss of energy and monetary savings, does not fall into this category.

Secondly, in the context of the revision of the Energy Labelling legislation, which was finalised in August 2017 with the adoption of a new Regulation, the co-legislators considered that self-declaration was still the appropriate conformity assessment procedure for demonstrating compliance with product-specific energy labelling requirements (e.g. for washing machines, vacuum cleaners and refrigerators). Although there has been a strong call for more, and more effective, market surveillance to check compliance, this is addressed by the extension of the type approval process to the label declaration and the product registration database.

Thirdly, the tyre labelling regulation is closely linked to the GSR, which imposes a type approval process on tyre manufacturers for key tyre parameters, but does not require mandatory third party testing. Imposing this only for the purpose of tyre labelling would mean diverging from this process and adding additional costs for manufacturers.

Fourthly, there is a risk that the lack of independent test laboratories[90] will constitute a barrier for placing new tyre models, including better performing tyres, on the market. Finally, third party testing is not guaranteed to address the inaccuracy of the information on the label, as this is at least partly driven by difficulties with the test procedures as such and not only by whether the tests are undertaken by a third party. This is also an issue best dealt with under the GSR, as the instrument that sets the general testing requirements.

[90] See Review study, https://ec.europa.eu/energy/sites/ener/files/documents/Study%20in%20support%20of%20the%20Review%20of%20the%20Tyre%20Labelling%20Regulation_final.pdf

Table 5: Options that were discarded at an early stage and options that were modelled

Discarded options	Inclusion of studded tyres Inclusion of re-treaded tyres Inclusion of mileage as a performance parameter Inclusion of abrasion as a performance parameter Mandatory and independent third-party testing
Modelled options	PO2: Non-regulatory measures PO3:Targeted legislative actions PO3B: As policy option 3, but without the effect of re-adjustment the label classes PO3C: As policy option 3, but without the effect of the extension of the type approval procedure to the declaration of the label values PO3D: As policy option 3, but without the effect of online labelling PO3E: As policy option 3, but without the effect of the tyre registration database PO3F: As policy option 3, but without the effect of further OEM requirement PO4: Policy option 2 + option 3. Non-legislative measures and targeted legislative actions are all applied PO4B: as policy option 4, but without the effect of re-adjustment the label classes PO4C: As policy option 4, but without the extension of the type approval procedure to the declaration of the label values PO4D: As policy option 4, but without the effect of online labelling PO4E: As policy option 4, but without the effect of the tyre registration database PO4F: As policy option 3, but without the effect of further OEM requirement

6. What are the impacts of the policy options?

The impacts were modelled following the methods set out in detail in Annex 4. The key assumptions underlying the modelling were:

- General assumptions: market data and prices for C1 (replacement tyres and OEM), C2 and C3 tyres; average number of kilometres that are driven each year; average lifespan of tyres; etc.

- Scenario assumptions: sales data; distribution of tyre models in the different label classes over time; effects of non-compliance; etc. (For instance, non-compliance is assumed to decrease in option 2 and even more in option 3 to 7%, compared to 15% in BAU scenario).

- Behavioural assumptions: impact of information campaigns and readjustment of the classes on end-users' buying behaviour; impact of improved market surveillance on compliance rate; impact of including snow and ice indicators on the label on number and severity of accidents; etc. (For instance, awareness of the label is assumed to increase from 41% to 60% due to information campaigns).

Given that there is significant uncertainty in particular as regards the behavioural assumptions, the impact assessment includes an extensive sensitivity analysis in section 8.2.

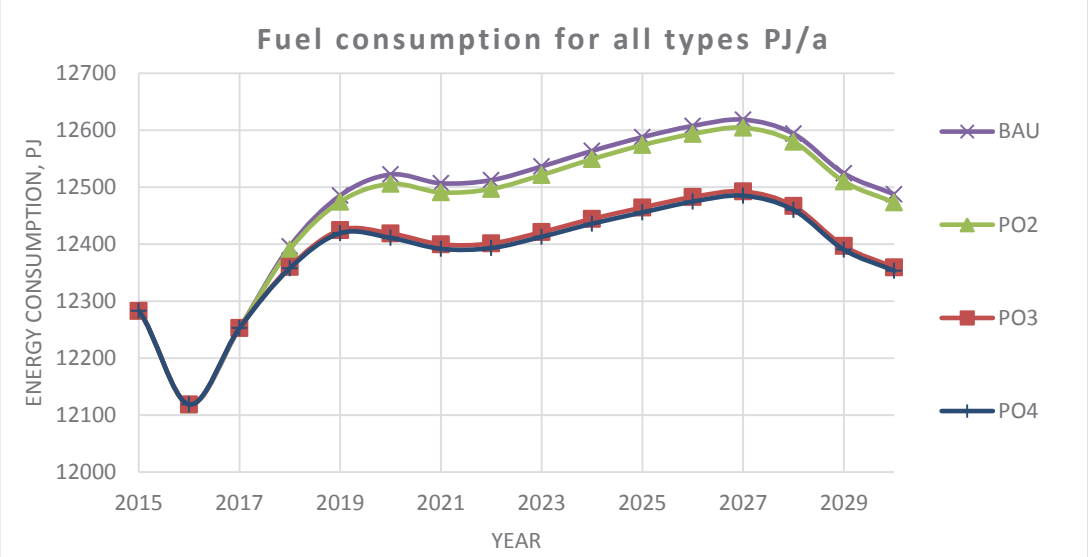
6.1. Environmental impacts

6.1.1. Fuel consumption

The rolling resistance of the tyres affects the energy consumption of a vehicle, and the differences in fuel consumption shown in the figure below are due to different rolling resistance in each policy scenario (the BAU values are provided for comparison). As seen in the figure below, policy option 4 (PO4) has the lowest annual energy consumption followed by policy option 3 (PO3).

Both scenarios give slightly higher consumption without re-adjustment of the label (PO3B and PO4B), but significantly higher consumption without the extension of the type approval procedure to the declaration of the label values (PO3C and PO4C). This can also be seen from the cumulative energy savings from 2017 to 2030, which are shown for each policy option in the table below, and the part of the saving resulting from each specific measure, where 36-39% of total savings results from the extension of the type approval procedure to the declaration of the label values. These two specific sub-options are shown in the graph below, while all sub-options are shown in the table under the graph.

Figure 3: Total fuel consumption for main scenarios expressed in PJ per annum[91].



Source: Modelling by Viegand Maagøe – see methodology Annex 4

Table 6: Cumulative fuel savings in PJ achieved by 2030 in each policy scenario (compared to BAU)

Specific measure	**PO2**	**PO3**	**PO4**
Annual savings in 2030	14 PJ/year	123 PJ/year	129PJ/year
Cumulative savings (2017-2030)	179 PJ	1348 PJ	1440 PJ
Savings distributions on each specific measure in the options			
Information campaigns	48 PJ (27%)	not applicable	40 (3%)
Concerted market surveillance	130 PJ (73%)		*109 (8%)
Extension of type approval procedure		526 (39%)	514 (36%)

[91] 1 Peta Joule per year is equal to 1 000 000 000 000 000 Joule per year (The Joule is a derived unit of energy in the International System of Units. It is equal to the energy transferred to (or work done on) an object when a force of one Newton acts on that object in the direction of its motion through a distance of one metre).

Re-adjustment of label (with new A)	not applicable	86 (6%)	87 (6%)
Online labelling		91 (7%)	85 (6%)
Digital registration database		*197 (15%)	*184 (13%)
Inclusion of OEM tyres		427 (32%)	400 (28%)
Technical doc. and data sheet		*21 (2%)	*20 (1%)

**The effect of these measures on compliance rate diminishes when extension of type approval procedure testing is applied*

Source: Modelling by Viegand Maagøe (see methodology Annex 4)

As seen in the previous table, the fuel savings are to a large extent driven by the decrease in non-compliance induced by the extension of type approval procedure testing (36-39% of savings) and by the mandatory labelling of OEM tyres at all times (28-32% of savings). It should be noted that including the extension of type approval procedure testing leads to a reduction in non-compliance, which is also driven by the digital registration database, the technical documentation content definition and concerted market surveillance decreases. Hence, the effects of these other measures will be greater than shown in the figure above if the extension of type approval procedure testing is not implemented.

It is important to note that the effect of label re-adjustment relies on the assumption that it is technically possible to improve both the rolling resistance and the wet grip parameters to the new class A (see annex 6). Re-adjusting the label with four classes (A-D) is assumed to cause a saving somewhere between the re-adjusted label (adding a new class) and not changing the label classes, i.e. somewhere between 0-6%. This is because in this case the class A threshold is not moved, but end-users might perceive the difference between A and D on the label as more significant, because classes below D are not shown.

The impact of information requirements on end-users' purchase behaviour has been investigated, and it is found that the awareness of the label and the importance of each label parameter to the end-user determines how large a share of end-users would buy higher rated tyres. For the rolling resistance parameter, 34% of end-users find it "very important" according to the 2016 consumer survey, but only a fraction of them is expected to actually purchase a more fuel-efficient tyre based on more/better information (See methodology Annex 4).

6.1.2. CO_2 emission mitigation

CO_2 emissions are directly linked to vehicle fuel consumption, and the savings follow the same pattern as the fuel savings, hence the scenarios have the same relative savings. The absolute values are given in the table below.

Table 7: CO_2 emission savings from each policy option in Mt CO_2-eq.

The distributions between specific measures in % are the same as fuel savings shown in the previous table.

Policy option:	**PO2**	**PO3**	**PO4**
Annual CO_2-eq savings in 2030	1.1 Mt/year	9.1 Mt/year	9.5 Mt/year
Cumulative CO_2-eq savings (2017-2030)	13 Mt	99 Mt	106 Mt

Source: Calculation modelled by Viegand Maagøe (See methodology Annex 4)

In addition to CO_2, other emissions result from the exhaust of vehicles. These include NOx gasses, exhaust particles, CO, SO_2, etc.[92]. These pollutants will decrease with the fuel savings and CO_2 emissions in all scenarios.

Policy option 4 is estimated to deliver 129PJ of final energy by 2030, which is around 0.8% of the savings needed to reach the EU's target of 30% energy efficiency by 2030. It is also estimated to save around 10 Mt CO_2 equivalent, which would contribute 1% towards the EU's target of 40% GHG emissions reduction by 2030.

6.1.3. Noise pollution

It is not possible to quantify exactly the direct health effect of tyre external rolling noise levels. However, it is well-established that noise influences human health and causes both premature deaths and hospitalisations due to cerebrovascular diseases and coronary heart disease[93], especially related to noise above 55 dB.

The average noise levels for each scenario are given in the table below, noting that the lower the values, the less serious the negative health effect. Since external rolling noise is generally considered less important than other factors by end-users, the effect of the label information is limited.

Table 8: Noise levels in 2030 for each tyre type (C1, C2 and C3) in each policy option

2030 noise levels	C1 tyres		C2 tyres		C3 tyres	
Policy Option	Replacement	OEM	Replacement	OEM	Replacement	OEM
BAU	70.5	71.2	72.1	72.5	71.5	72.0
PO2	70.3	71.2	71.9	72.5	71.3	72.0
PO3	70.2	70.2	71.7	71.7	71.7	71.1
PO4	70.1	70.1	71.7	71.7	71.0	71.0

Source: Calculations by Viegand Maagøe (See Methodology Annex 4)

6.2. Social impacts

6.2.1. Road safety

One of the largest social impacts related to tyres is safety, which is determined by the wet grip of the tyre. The wet grip is related to braking length and thus to impact and speed in accidents, which affects the severity of injuries. Reduced impact speeds also lead to less severe accidents, or even to avoided accidents, when the grip allows coming to a full stop before impact.

The following Table_ gives an overview of how safety, in terms of severity in accidents, is affected in each policy scenario. Note that only accidents on *wet road* (9% of total accidents) and accidents on *snowy (1%)* and *icy (1%) road* are considered here, since the policy options include safety parameters only for wet grip, snow grip and ice grip. It should be noted that there is a generally positive correlation between grip on wet road and grip on dry road, even though it is not directly quantifiable. This means that the effect of increasing wet grip will also have a positive effect on safety on dry road, leading to an even higher number of avoided fatalities and injuries than shown in the table below.

92 https://www.theaa.com/driving-advice/fuels-environment/emissions

93 http://www.rivm.nl/dsresource?objectid=a4029a59-c241-46c8-b8d1-8f2f537e9ac1&type=org&disposition=inline

Table 9: Severity of accidents in each policy option, measured by number of fatalities, severe injuries and minor injuries caused by traffic accidents on wet, snowy and icy roads.

		BAU	PO2	PO3	PO4
Annual occurrence 2030 (in numbers)	Fatalities	1 390	1 387	1 332	1 331
	Severe injuries	14 138	14 016	11 556	11 540
	Minor injuries	134 583	134 720	136 400	136 465
Cumulative number, 2017-2030	Fatalities	Not applicable	53	790	818
	Severe injuries		1 534	27 593	28 489
	Minor injuries		-1 729	-20 612	-21 472

Source: Calculations by Viegand Maagøe (see methodology Annex 4)

As seen from the above Table, the number of fatalities and severe injuries decrease with the increase in safety parameters (wet grip, snow grip and ice grip) in the three policy scenarios compared to BAU. PO4 shows the largest improvement, but with very similar results in PO3, of 4% fewer fatalities and 19% fewer severe injuries per year in 2030.

If the same improvement is assumed for dry road safety, it would correspond to 543 less fatalities per year in 2030 (where total fatalities are assumed to have fallen to 12,640 in the BAU scenario) and 24,160 less severe injuries (out of the total 128,500 in the BAU scenario in 2030).

At the same time, however, the number of minor injuries increases in the policy scenarios, and most in PO4 and PO3. This is because the wet grip affects the *severity* of accidents, and thus the accidents that would have inflicted e.g. a severe injury in BAU, cause only minor injuries in the policy options. However, the number of avoided fatalities and severe injuries are higher than the increase in minor injuries, because some accidents no longer cause personal injuries at all, due to increased grip of the tyres.

6.2.2. Noise health effects

Noise is an important social impact factor of tyres due to related health issues. Road traffic noise at levels over 55 dB L_{den}[94] affects an estimated 100-125 million European citizens based on noise mapping, with the actual number most likely being higher due to incomplete reporting[95,96]. For sleep disturbance, an indicator of 50 dB L_{night} is recommended[97].

Table 10: Health effects of environmental noise from road traffic

Implication	Annoyance	Sleep disturbance	Hospitalisations	Deaths	Reading impairment
Affected people	20 million	8 million	43 000	10 000	8 000

Source: https://www.eea.europa.eu/signals/signals-2016/articles/transport-and-public-health

Due to the large variations in reported numbers, it is not possible to quantify exactly the correlation between tyre external rolling noise and noise exposure in the different policy options. The World Health organisation (WHO) and the European Environmental Agency (EEA) assessed the health effects of the environmental noise form road traffic in

[94] Lden is the average annual Day, Evening and Night noise level, and 55 dB is the value set in the Environmental Noise Directive for noise mapping and assessments.

[95] https://www.eea.europa.eu/highlights/road-traffic-remains-biggest-source

[96] https://www.eea.europa.eu/signals/signals-2016/articles/transport-and-public-health

[97] http://ec.europa.eu/environment/noise/directive_en.htm

the unit Disability Adjusted Life Years (DALY) per year. The latest data from this assessment (from 2011) is used here.

Table 11: WHO health effects of environmental noise form road traffic in DALY/year

Implication	Cardio vascular	Annoyance	Sleep disturbance	Tinnitus	Cognitive impairment in children	Total
DALY/year	140 890	378 590	354 134	4 577	14 316	873 981

Source: Excel sheet provided by DG Environment, based on data form World Health Organisation (WHO) from 2011

Using the model, the decrease in health impacts in the table below can be calculated for an average decrease in noise exposure by 1 dB. This saving can be monetarised by using the Value of One Life Year (VOLY) Noise Directive, namely €110 987. This calculation is shown here as an example of impacts that can be obtained by decreasing road noise levels. The impacts cannot be calculated for each policy scenario because the improvement in average noise levels is overall too small (less than 1 dB).

Table 12: Health and monetary impacts of decreased noise exposure

Implication	Cardio vascular	Annoyance	Sleep disturbance	Tinnitus	Cognitive impairment in children	Total
Decrease, DALY/year	19 154	37 655	37 621	364	1 320	94 471
Decrease, %	14%	10%	11%	8%	9%	11%
Savings/year, billion euro	2.13	4.18	4.18	0.04	0.15	10.49

6.3. Economic impacts

6.3.1. Societal costs

Traffic accidents and noise pollution result in high societal costs. However, it has only been possible to quantify the accident-related costs impacts of the policy scenarios[98]. The total monetary savings are related to the number of accidents leading to fatalities, severe injuries and minor injuries respectively (see section 6.1).

The accident related cost savings in EUR million are shown in the table below as annual costs in 2030 and cumulative costs savings from 2017 to 2030. Policy scenarios 3 and 4 give rise to the highest savings (i.e. largest decrease in severe accidents). Not including re-adjustment or extension of type approval procedure testing would each result in approximately EUR 160 million less savings in 2030.

Table 13: Health costs of fatalities, severe and minor injuries in traffic.

		BAU	**PO2**	**PO3**	**PO4**
Annual costs EUR 2030 million	Fatalities	2 354	2 348	2 255	2 254
	Severe injuries	3 565	3 534	2 914	2 910
	Minor injuries	2 622	2 625	2 657	2 659
	Total	8 541	8 507	7 826	7 822

[98] Total noise-related fatalities and hospitalisations including related costs are available only for the year 2014, and no correlation was made between tyre rolling noise and these incidents.

Cumulative cost savings 2017-2030, EUR million	Fatalities	Not applicable	89	1 330	1 378
	Severe injuries		386	6 948	7 173
	Minor injuries		-34	-401	-418
	Total		442	7 876	8 133

Source: Calculations by Viegand Maagøe (see Methodology Annex 4)

6.3.2. Financial savings for end-users

The economic impact for end-users primarily consists of the tyre purchase price and the fuel cost savings in the use-phase. The rolling resistance directly affects the fuel cost, whereas the combined performance of the three label parameters affects the tyre purchase price. Hence, the fuel savings caused by decreasing rolling resistance have to counterbalance the increase in purchase price caused by the total performance improvement. As seen in the table below, the economic benefit for vehicle owners is low, with PO3 and PO4 giving the highest end-user savings of below 1%. Calculations are based on average market values for rolling resistance and prices. The Total Cost of Ownership (TCO) is calculated as the purchase price for a full set of tyres and the fuel cost over the average tyre lifetime. The fuel cost savings have not been discounted.

Table 14: End-user Total Cost of Ownership (TCO), for C1, C2 and C3 users, at individual end-user level and on EU level. Based on tyre mileage and number of tyre fitted on each vehicle

	Tyre type	**BAU**	**PO2**		**PO3**		**PO4**	
End-user level, EUR		**TCO**	**TCO**	**Saving**	**TCO**	**Saving**	**TCO**	**Saving**
	C1	5 164	5 155	9 (0.2%)	5 136	28 (0.5%)	5 129	35 (0.7%)
	C2	12 473	12 467	6 (0.0%)	12 409	64 (0.5%)	12 400	73 (0.6%)
	C3	88 454	88 342	112 (0.1%)	87 933	521 (0.6%)	87 780	673 (0.8%)
EU level, billion EUR	C1	1 742	1 739	3 (0.2%)	1 733	9 (0.5%)	1 730	12 (0.7%)
	C2	512	512	0 (0.0%)	509	3 (0.5%)	509	3 (0.6%)
	C3	666	665	1 (0.1%)	662	4 (0.6%)	661	5 (0.8%)
	Total	**2 920**	**2 916**	**4 (0.1%)**	**2 904**	**16 (0.5%)**	**2 900**	**20 (0.7%)**

Source: Calculations by Viegand Maagøe (See methodology Annex 4)

6.3.3. Turnover and Employment

The business turnover is calculated for a simplified supply chain consisting of three actors: manufacturers, wholesalers and retailers. The turnover and employment are based directly on tyre sales and prices, and are without inflation or discounting. The estimated "mark-up factors" shown in the table below are used to scale between the three supply chain links, and the "revenues per employee" are used to estimate employment. More details on calculations are provided in Annex 4.

Table 15: Estimated mark-up factors and turnover per employee used in calculations

Market	Turnover/employee EUR	Mark-up factors
Retail	25 511	2
Wholesale	59 241	1.25
Manufacturer	63 929	1

Source: http://www.eurocommerce.eu/retail-and-wholesale-in-europe/facts-and-figures.aspx

As seen in the two tables below, both turnover and employment are expected to increase towards 2030 due to an increase in sales (2.1% per year for entire market) and in

performance (see tyre unit prices in Annex 4). The difference between the scenarios is thus based entirely on tyre price increases due to increased performance, and PO3 and PO4 provide the largest performance increase and thus the largest turnover and employment benefit compared to BAU. See Annex 4 for the graphs of the turnover and employment development from 2017 to 2030.

Table 16: Estimated turnover and cumulative increase by 2030 for manufacturers, wholesalers and retailers in the tyre sector

	Sector	BAU	PO2	PO3	PO4
2030 levels, million Euro	Retail	52 656	52 619	57 107	56 900
	Wholesale	32 910	32 887	35 692	35 562
	Manufacture	26 328	26 310	28 553	28 450
	Total	**111 893**	**111 816**	**121 352**	**120 912**
Cumulative increase, 2017-2030, million euro	Retail	Not applicable	2 786	44 606	46 803
	Wholesale		1 742	27 879	29 252
	Manufacture		1 393	22 303	23 401
	Total		**5 921**	**94 787**	**99 456**

Source: Calculations by Viegand Maagøe (see methodology Annex 4)

Table 17: Estimated employment and cumulative increase by 2030 for manufacturers, wholesalers and retailers in the tyre business (in full-time equivalents)

	Sector	BAU	PO2	PO3	PO4
2030 levels, employees	Retail	2 064 037	2 062 603	2 238 519	2 230 405
	Wholesale	555 524	555 138	602 484	600 301
	Manufacture	411 830	411 544	446 644	438 395
	Total	**3 031 391**	**3 029 285**	**3 287 647**	**3 269 101**
Increase in employees between 2017-2030,	Retail	Not applicable	109 227	1 748 487	1 834 608
	Wholesale		29 398	470 595	493 774
	Manufacture		21 794	348 870	366 053
	Total		**160 419**	**2 567 953**	**2 694 435**

Source: Calculations by Viegand Maagøe (see methodology Annex 4)

6.4. Other impacts

6.4.1. Impact on competitiveness

Overall, any measure improving end-users' understanding of the tyre label and manufacturers' compliance with the labelling requirements, will improve competitiveness in the tyre market, since the tyre label would increasingly be a decision parameter for end-users in a purchase situation. The higher the understanding of, and confidence in, the label, the more end-users are likely to use the information given on the label to decide which tyre to buy. This means that tyre manufacturers can use the tyre label parameters to a higher degree to benchmark and differentiate their products.

This increase in competitiveness is likely to be the highest with the re-adjustment option that sets a new threshold for class A, since no or only very few tyres have yet achieved rolling resistance and wet grip within class A. The combination of new class A in both wet grip and rolling resistance would be difficult to reach and would likely cause competition among manufacturers, as was the case in 2012 when the label was first

implemented[99]. This would also support EU tyre manufacturers, which tend to produce higher quality tyres, to compete in the market.

6.4.2. Impact on innovation

Although very few tyres are currently rated in fuel efficiency class A, there is a lot of research and development (R&D) effort in tyre manufacturing[100] to achieve high performance in both wet grip and rolling resistance at the same time, as these two parameters counteract each other. This innovation effort is expected to increase as more end-users become aware of the tyre label and increased market surveillance results in a more level playing field, in which manufacturers are awarded for producing better performing tyres. Readjusting the label classes will most likely increase the innovation effort as well.

As noted in the 2016 Review Study, innovation is most likely to focus on rubber mixtures and additives that allow the development of tyre treads with properties promoting both good wet grip and fuel efficiency.

6.4.3. Impact on SMEs

On the manufacturer side, the EU market is primarily comprised of large global tyre companies, represented by ETRMA with 12 companies in total. ETRMA members account for 72% of the European C1 and C2 tyre markets and 70% of the C3 tyre market (2016)[101]. No SME tyre manufacturer was identified in the EU. Tyre imports from non-EU countries cover the remaining market share of roughly 30 %[102].

By contrast, SMEs dominate the tyre retreading industry with a market share of 35-40% of truck and bus tyres (C3). As described in section 5.3.1.2, the inclusion of retreaded tyres in the labelling scheme has been discarded mainly because the current testing methods would make the retreading business economically unfeasible, especially for SMEs. The proposed policy options are therefore not considered to have significant impacts on these businesses.

SMEs active in retailing/importing of tyres could face additional costs by the proposed changes, specifically related to the obligation on manufacturers and retailers to show the label when tyres are offered for sale online. These costs relate mainly to the obligation to ensure that the information is provided in a legible, comprehensible and comparable fashion, independently of the end-user's Internet access device; this may create web design costs. Providing the information to end-users once the design stage is completed bears no additional cost. Furthermore, this proposal does not change the coverage of the TLR in terms of products or create obligations to produce new information. Therefore, it is not expected to give rise to significant implementation costs.

Finally, SMEs using tyres in their activities will benefit from reduced costs over the lifetime of the tyres and increased safety for their employees.

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99 http://www.transportengineer.org.uk/transport-engineer-news/goodyear-unveils-first-aa-grade-steer-concept-tyre/45469

100 See Review Study

101 http://www.etrma.org/uploads/20170912%20-%20Statistics%20booklet%202017%20-%20alternative%20rubber%20section%20FINAL%20web1.pdf

102 The majority of these companies are represented through the International Tyre Manufacturers' Association (ITMA). See https://itma-europe.com/history/

7. How do the options compare?

7.1. Summary of impacts and options comparison

As seen from the results presented in the two tables below, PO4 results in the greatest overall benefits, closely followed by PO3. PO2 gives only minor benefits in comparison, and in terms of turnover (and employment), it actually causes a decrease. This is because the development in BAU outpaces the overall improvement in tyre performance by 2030 in PO2, thus causing a lower tyre price and a lower turnover in the industry (see consumer prices in Annex 4). In cumulative savings, PO2 does provide only minor improvements.

However, when combined with the legislative amendments in PO3, the information campaigns and increased market surveillance efforts pay off, as seen from the difference in benefits between policy options 3 and 4 (option 4 being the combination of options 2 and 3). In other words, the information campaigns and concerted enforcement actions *in addition* to legislative improvements will have a greater effect than information requirements without further legislative changes. This conclusion is supported by experience with energy labelling of household appliances, where the combination of legislative requirements with improved market surveillance and information efforts towards consumers has been effective.[103]

By their very nature, the non-regulatory measures of option 2 contribute to a lesser extent to the general and specific objectives than the targeted legislative actions of option 3. Nevertheless, as argued above, legislative and non-legislative measures mutually reinforce another and work best in combination (option 4).

[103] See Impact Assessment for the Energy Labelling Regulation, section 8

Table 18: Summary of policy option impacts, changes in annual values by 2030 compared to BAU

2030	Energy savings	GHG	End-user expenditure			Extra turnover			Compliance costs				Road safety			Societal health costs		
	Fuel savings	CO_2-eq reduction	Purchase cost saving	Energy cost savings	Net cost savings	Manu-facture	Whole-sale	Retail	Manufacturers	Retail	Member states	Commission	Fatalities	Severe injuries	Minor injuries	Fatalities	Severe injuries	Minor injuries
Policy Option	PJ	Mt	mln. €	mln. €	mln. €	mln. €	mln. €	mln. €	mln. €	mln. €	mln. €	mln. €	Nr.	Nr.	Nr.	mln. €	mln. €	mln. €
PO2	**14**	**1.1**	**37**	**812**	**849**	**-18**	**-23**	**-37**	**0**	**0**	**0.02**	**0.5-1**	**3**	**122**	**-137**	**6**	**31**	**-3**
PO3	**123**	**9.1**	**-4 451**	**6 632**	**2 181**	**2 226**	**2 782**	**4 451**	**127**	**50**	**0.02**	**0.5-1**	**58**	**2 582**	**-1 818**	**99**	**651**	**-35**
PO3B	109	8.0	-3 615	5 899	2 284	1 808	2 260	3 615	127	50	0.02	0.5-1	47	2 035	-1 505	79	513	-29
PO3C	84	6.2	-3 397	4 522	1 125	1 698	2 123	3 397	126	50	0.02	0.5-1	47	2 081	-1 492	80	525	-29
PO3D	114	8.4	-4 415	6 143	1 728	2 208	2 759	4 415	127	50	0.02	0.5-1	57	2 548	-1 790	97	643	-35
PO3E	101	7.4	-4 018	5 445	1 427	2 009	2 511	4 018	127	50	0.02	0.5-1	56	2 499	-1 750	95	630	-34
PO3F	93	6.8	-1 808	5 030	3 222	904	1 130	1 808	127	0	0.02	0.5-1	37	1 487	-1 480	63	375	-29
PO4	**129**	**9.5**	**-4 244**	**7 012**	**2 768**	**2 122**	**2 653**	**4 244**	**127**	**50**	**0.02**	**0.5-1**	**59**	**2 598**	**-1 882**	**100**	**655**	**-37**
PO4B	120	8.9	-3 237	6 560	3 323	1 619	2 023	3 237	127	50	0.02	0.5-1	44	1 932	-1 429	75	487	-28
PO4C	90	6.6	-3 531	4 902	1 371	1 766	2 207	3 531	126	50	0.02	0.5-1	48	2 097	-1 551	81	529	-30
PO4D	123	9.0	-4 252	6 687	2 435	2 126	2 657	4 252	127	50	0.02	0.5-1	59	2 577	-1 868	99	650	-36
PO4E	114	8.4	-4 193	6 221	2 028	2 096	2 620	4 193	127	50	0.02	0.5-1	58	2 545	-1 848	98	642	-36
PO4F	94	6.9	-1 720	5 174	3 454	860	1 075	1 720	127	0	0.02	0.5-1	39	1 517	-1 528	65	382	-30

Source: calculations by Viegand Maagøe (see methodology Annex 4). Further details about administrative costs appear in Annex 3.

Table19: qualitative evaluation of the policy options. PO3B and PO4B exclude re-adjustment and PO3C and PO4C excluding the extension of type approval procedure

Option	Energy savings	GHG	End-user expenditure	Extra turnover	Compliance costs	Road safety	Societal health costs	Total Nr of "+"
PO2	(+)	(+)	+	-	+++	+	+	6
PO3	++(+)	++(+)	++	+++	++	+++	+++	18
PO3B	++(+)	++(+)	++	++	++	++	++	15
PO3C	++	++	+	++	++	++	++	13
PO3D	++(+)	++(+)	+(+)	+++	++	+++	+++	17.5
PO3E	++(+)	++(+)	+	++(+)	++	+++	+++	16.5
PO3F	++	++	+++	+	++	+(+)	+(+)	13
PO4	+++	+++	++(+)	+++	++	+++	+++	**19.5**
PO4B	++(+)	++(+)	+++	++	++	++	++	16
PO4C	++	++	+	++	++	++	++	13
PO4D	++(+)	++(+)	++	+++	++	+++	+++	18
PO4E	++(+)	++(+)	++	++	++	+++	+++	17
PO4F	++	++	+++	+	++	+(+)	+(+)	13

Source: Based on calculations by Viegand Maagøe (see methodology Annex 4)

Option 4 adds the non-regulatory measures of option 2 to the legislative actions identified in option 3. Given that the legislative actions result in significantly more savings than the non-regulatory ones, option 4 does not deliver much more savings compared to option 3. Nevertheless, as outlined in section 7.1, second paragraph, the non-regulatory and legislative actions mutually reinforce each other. For example, joint surveillance action by Member States will be more effective once the registration database is in place, which would give them central access to all compliance information. In addition, in option 4 the Member States play an important role and this can have an additional beneficial effect in terms of increasing their commitment to the tyre labelling scheme.

From the overall ranking, PO4 (combination of policy options 2 and 3) comes out best overall. PO3 alone gives almost the same improvements as PO4.

8. Preferred option

8.1. Description of the preferred policy option

Based on the analyses presented in the previous chapters, the preferred option is PO4, which combines the specific measures from PO2 and PO3. This option includes the following measures:

Table 20: Specific measure included in the preferred option

POLICY OPTION	*SPECIFIC MEASURES*
PO 4 – Combination of PO 2 and PO 3: Non-regulatory actions and Targeted amendments to the TLR	1. Information campaigns 2. Joint enforcement actions 3. Mandate to revise/develop relevant testing methods (e.g. abrasion) 4. Online labelling 5. Mandatory labelling of tyres delivered with vehicles at all times 6. Require label to be provided for C3 tyres 7. Require label to be provided to end-users in case of purchase through leasing contracts or as part of a fleet solution 8. Mandatory inclusion of snow performance on the label 9. Mandatory inclusion of ice performance on label 10. Re-adjustment of the label classes 11. Tyre registration database 12. Technical documentation and product fiche content 13. Amendment of current Annex V on test method for wet grip of C1 tyres 14. Amendment of current Annex IVa on laboratory alignment procedure for the measurement of Rolling Resistance Coefficient (RRC) 15. Extension of the type approval process to include label declaration

The preferred option is estimated to result in the following administrative costs.

Table 21: Overview of administrative costs (all costs are direct costs) compared to baseline.

II. Overview of costs (million EUR) – Preferred option				
Options	**Manufacturers**	**Retailers**	**Member States**	**EU/Commission**
Information campaigns			10 (only once)	2 (only once)
Joint enforcement actions			0.02 per year	0,5-1 per year
Online labelling			3 (only once)	
Labelling of tyres delivered with vehicles		50 per year[104]		
Provision of label for C3 tyres	6 per year[105]			
Mandatory inclusion of snow and ice performance				
Re-adjustment of the label classes	40 (only once)[106]	30 (only once)		
Tyre registration database	0.25 per year			0.1 (only once) and 0.01 per year
Content of technical documentation and product fiche	120 per year[107]			
Amendment of measurement methods in Annex IVa and V				
Extension of type approval procedure	0.65 per year			
Total	127 per year 40 only once	50 per year 30 only once	0.02 per year 13 (only once)	0,5-1 (per year) 2,1 (only once)

Source: Based on calculations by Viegand Maagøe

8.2. Sensitivity assessment of the preferred option

Although 75% of those questioned in the consumer survey said that their confidence in the label would influence their purchasing decisions, there is no quantitative evidence of the effect of the label on consumer behaviour. Quantitative data on compliance rates was also difficult to obtain. Therefore, a sensitivity analysis is presented below to assess the impact of the lack of data.

8.2.1. Compliance rate

In the modelling of the preferred option, the compliance rate is expected to increase, which in turn is expected to cause decreases in fuel consumption, traffic accident severity and noise levels. In particular, the specific options of extension of the type approval accredited testing,

104 Retailers of vehicles

105 Manufacturers of C3 tyres

106 Cost per readjustment; if the label is re-adjusted again after for instance 10 years, cost for readjustment will appear again

107 For provision of product information sheet

joint enforcement actions, the tyre registration database and definition of the technical documentation and product information sheet content are expected to increase compliance rates.

In the BAU scenario a non-compliance rate of 15% is assumed, with non-compliant tyres expected to be on average two classes below their label value. In the preferred option, the non-compliance rate is assumed to decrease to 7% with non-compliant tyres on average being one class lower than the label value. This change is due to the collective effect of all of the above-mentioned specific options. In all scenarios it is assumed that the rate of non-compliance is the same for all three label parameters.

Since the non-compliance rate is based largely on assumptions for both the BAU[108] scenario and the preferred option, and the compliance rate has a large effect on the impact, a sensitivity assessment was conducted to address this uncertainty.

In the preferred option the non-compliance rate was varied between 0% (ideal scenario) and 15% (BAU) for all three label parameters with average non-compliance magnitudes of one and two classes.

For the total energy consumption, the correlation with the compliance rate is:

- 2.6 PJ/year in 2030 per %-point change for 1 class non-compliance;
- 5.2 PJ/year in 2030 per %-point change for 2 classes of non-compliance.

For the safety cost, the correlation with the compliance rate is:

- 9.1 million euro/year in 2030 per %-point change for 1 class non-compliance. The maximum difference (from 0% to 15% non-compliance) was 11 fatalities and 500 severe accidents;
- 18.6 million euro/year in 2030 per %-point change for 2 classes non-compliance. The maximum difference (from 0% to 15% non-compliance) was 22 fatalities and 1000 severe accidents.

For noise, the correlation cannot be made by noise class (number of "soundwaves" on the label), since the class depends on tyre size and type. Instead, the sensitivity analysis was based on dB values and the correlation to compliance rate is:

- 0.01 dB in average value per %-point change for in non-compliance.

If only half of the expected improvement in the non-compliance rate would be achieved, compared to the preferred option, the result would be:

- 24.5 PJ less fuel savings in 2030, corresponding to 19% less than the total savings in the preferred option (129 PJ/year in 2030);
- 88 million euro less in health cost savings in 2030, corresponding to 12% of the total savings in the preferred option (718 million euro in 2030);
- 0.05 dB higher noise levels on average, corresponding to around 10% of average values for all tyre types. The resulting values, however, depend highly on tyre size and type.

[108] Non-compliance rates of around 15% were reported but it was not specified for which parameter and how many classes the non-compliance was on average.

8.2.2. Consumer behaviour

In the modelling of the preferred option, consumers are assumed to react to the label information by purchasing better performing tyres. Specifically, the options related to online labelling, information campaigns and the product registration database are expected to increase label awareness[109]. The impact of the policy option is based on the number of end users purchasing better tyres, which is determined from a combination of the following parameters:

- Potential increase in awareness from awareness raising campaigns (59%)[110]
- Number of end users purchasing tyres online (21%)[111]
- Number of end users consulting the product database for information (51%)[112]

Furthermore, the share of respondents in the 2016 consumer survey who rated each parameter as "very important" is assumed to be affected by the label on that specific parameter:

- Rolling resistance (efficiency): 34%
- Wet grip (safety): 62%
- Noise: 21%

The combination of the above parameters was used to determine the share of end users affected by increased information provision for each parameter. The affected share in the preferred option (Policy option 4) for each parameter is:

- 9% of end users would buy a tyre with better rolling resistance performance
- 17% of end users would buy a tyre with better wet grip performance
- 6% of end users would buy a tyre with better noise performance

Since the underlying assumptions for the effect of increased information is based on a single questionnaire and end users might react differently in real life or refrain from purchasing better performing tyres due to increased prices, a sensitivity assessment was made for the information effect for each parameter. In this sensitivity analysis, the affected share of end users was varied for each parameter and plotted against the impact.

The resulting correlation shows that the total impact of the preferred option is not very sensitive to consumer behaviour compared to the compliance rate.

- For fuel efficiency, the correlation was 2.5 PJ/year per %-point of users choosing differently. This means that if, for example, only half as many end users as assumed in the preferred option were to buy more fuel efficient tyres, the annual savings in 2030 would be 17 PJ less, corresponding to 12% of the total fuel savings from the preferred option in 2030.
- For safety (measured as societal health costs), the correlation is 1.42 million euro/year per %-point of end users choosing differently. If only as many end users as assumed in the preferred option were to buy tyres with better wet grip, annual societal health cost

[109] These specific options are backed up/made possible by simultaneously adapting the measures related to requiring provision of a label for C3 tyres and in case of purchase through leasing contracts or as part of a fleet solution.

[110] In the 2016 consumer survey 41% of the respondents stated that they knew about the tyre label before taking the survey. The potential increase in awareness is thus 59%.

[111] In the 2016 consumer survey 21% of respondents stated that they would buy tyre online in the future.

[112] In the 2016 consumer survey 51% of respondents stated that they would use the online product registration database to search for information before purchasing new tyres.

savings in 2030 would be 19 million EUR less, corresponding to 3% of the health cost savings from the preferred option in 2030.

- For noise levels (dB measured values) the correlation for C1 tyres is 0.047 dB per %-point of end users affected by the noise information. If only half of the users assumed in the preferred option buy less noisy tyres, the difference in 2030 would be 0.24 dB on average, corresponding to a dB decrease of 0.34% less than the average noise in the preferred option. The percentage effect will be the same for C2 and C3 tyres.

8.3. REFIT (simplification and improved efficiency)

Identified possibilities for simplification of legislation and reduction of regulatory costs are:

Product registration database

Establishment and use of a product registration data, where manufacturers are obliged to upload product information including energy labels and technical documentation (including test reports), would make it easier and less costly for MSAs to access the required documentation. In addition, retailers will have easy access to download labels and product information sheets including electronic versions for labelling of tyres in web shops. Furthermore, a product registration database could also save time for manufacturers because they do not have to spend time to handle inquiries from market surveillance authorities about delivery of technical documentation, etc. On the other hand, manufacturers will face some extra costs for uploading the necessary information into the database.

The Commission is establishing a product registration database for energy-related products as required by the new Energy Labelling Framework Regulation. It is anticipated that tyres could be included in this database and the additional cost for extension of the database is considered marginal.

Alignment with General Safety Regulation

Both the TLR and the GSR require that tyres are tested according to UN-ECE[113] test standards. However, while the GSR requires an approval by a third party public authority before the product can be placed on the market, there is no such requirement in the TLR, according to which manufacturers makes a self-declaration. In both cases, manufacturers are allowed to do the testing in their own test facilities. In addition, under GSR a Technical Service can also do the test. To simplify the legislation and at the same time increase the compliance rates for tyres it is proposed to further align the TLR with the GSR with regard to certification procedures. Use of third party approval is more burdensome for manufacturers than self-certification but the manufacturers are already required to have their tyres approved under the GSR, even if a more thorough (and more expensive) testing is required to establish the label performance parameters. Therefore, the alignment could somewhat increase the manufacturers' costs for testing at an approved testing laboratory, but in return the tyres will only have to be tested once.

The use of pre-market approval for establishment of the tyre performance parameters on the label could reduce the need for testing by market surveillance authorities and thereby reduce Member States' enforcement costs, because the test results on which the label information is based would be more reliable.

Tyre Labelling Regulation/delegated acts

[113] UN-ECE: United Nations – Economic Commission for Europe

Currently, Article 11 of the TLR provides that implementing acts are to be used to introduce information requirements on wet grip for C2 and C3 tyres if suitable testing methods are available, adapt parameters for snow/ice tyres and to adapt the annexes to technical progress. It is proposed that TLR should be adapted to the TFEU and that the use of delegated acts in accordance with Article 290 should be specified. The use of such delegated acts could also allow amendments to the label itself, in certain circumstances, where appropriate based on insights/evidence from consumer behavioural testing (for example, if and when suitable testing methods for abrasion become available). This creates a certain parallel with the regulatory framework set up for energy-related products under the framework Energy Labelling Regulation. This would simplify the regulatory process when changes are required to achieve additional environmental improvements or to add parameters to the label.

The change of the regulatory process will save resources in the European regulatory process (in the Commission, the European Parliament and the Council) and at Member State level.

Table 22: Qualitative description of cost savings in the preferred option

REFIT Cost Savings – Preferred Option(s)		
Description	***Amount***	***Comments***
Product registration database	80 000 EUR/year[114]	Recurrent cost savings for Member State market surveillance authorities.. Eventually also cost savings for manufacturers. Initial marginal costs for the Commission to extend the database for energy-related products to cover also tyres.
Alignment with General Safety Regulation	420 000 EUR/year[115]	Could require more expensive tests for manufacturers in approved testing laboratories but in return, they will not have to carry out further testing. Reduced market surveillance costs (recurrent savings).
Tyre Labelling Regulation / delegated acts.	110 000 EUR per delegated act[116]	Will reduce the administrative costs in the EU law-making Institutions and in Member States.

9. How will actual impacts be monitored and evaluated?

The impact of the new TLR will be evaluated and monitored in a review study to be carried out 5-10 years after the entry into force of the new Regulation. In the review process, the impact of the TLR will be compared with the objectives of the Regulation as set out in the present Impact Assessment.

[114] An estimated 1 working day (7.5 hours) is saved per product because the technical documentation will be easier to obtain. The example further assume that each member state conducts 15 technical documentation checks per year, and the average labour cost is 25.4 Euro. http://ec.europa.eu/eurostat/statistics-explained/index.php/Hourly_labour_costs

[115] For Member States the need to test will decrease, since the testing will now be done by accredited, independent laboratories rather than through self-declaration by manufacturers. The number is based on assumed testing cost of 5000 EUR/test and 3 avoided tests per Member State per year.

[116] Assumptions: 1 week saved per MS, 28 weeks saved in European Parliament and Council, 12 weeks saved in the Commission, labour costs: 40 EUR/hour.

That review would include market analysis, which will allow the monitoring of the specific objective of having a well-known and well shown tyre label i.e. shown at all times when tyres are sold.

A consumer awareness study would also be part of the review, to assess how awareness of the label, and its impact on purchasing decisions, has improved. To align with general consumer awareness of energy labelling, the specific objective of having a well-known tyre label should be measured against the goal of 85% of consumers being aware of the label (which is the percentage of the Union's population who recognise the energy label on appliances).

The main monitoring element to verify compliance with the GSR and TLR requirements will be the tests carried out by national market surveillance authorities. This will check whether the new requirements have been complied with by suppliers. This monitoring is particularly relevant to the specific objective of having an adequately enforced tyre label. Reporting by Member States to the Expert Group on Tyres Labelling – Market Surveillance Administrative Cooperation[117] will provide data regarding market surveillance activities and compliance rates. Further data will also come from the ongoing MSTyre15 joint surveillance action and any follow-up projects.

The proposed mandatory product registration database will also be a source of more solid data to monitor and evaluate progress towards meeting the objectives of the TLR and will provide data on the distribution of tyre models across the different performance classes. It will also support market surveillance, which is essential for enforcement of the TLR. Enforcement would also be aided by requiring Member States to inform the Commission of the penalties and enforcement mechanisms applicable to infringements of the TLR.

[117] http://ec.europa.eu/transparency/regexpert/index.cfm?do=groupDetail.groupDetail&groupID=2808&Lang=EN

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PART 2/3

COMMISSION STAFF WORKING DOCUMENT

IMPACT ASSESSMENT

Accompanying the document

Proposal for a Regulation of the European Parliament and of the Council

on the labelling of tyres with respect to fuel efficiency and other essential parameters, and repealing Regulation (EC) No 1222/2009

{COM(2018) 296 final} - {SEC(2018) 234 final} - {SWD(2018) 188 final}

ANNEXES OF THE IMPACT ASSESSMENT ON THE REVIEW OF THE TYRE LABELLING REGULATION (EC) No 1222/2009/EC

Table of Content

Annex 1: Procedural information

1. Lead DG, Decide Planning/CWP references:

Lead DG: Directorate-General for Energy (DG ENER).

The initiative is included in the Commission Work Programme 2018 as agenda planning item: 2016/ENER/040

2. Organisation and timing:

The Inter Service Steering Group met three times: 29 January, 21 February and 6 March 2018. The Inter Service Steering Group included representatives of DGs Internal Market, Industry, Entrepreneurship and SMEs (GROW), Mobility and Transport (MOVE), Justice and Consumers (JUST), Environment (ENV), Climate Action (CLIMA), the Joint Research Centre (JRC) and the Secretariat General (SG).

3. Consultation of the RSB: The Regulatory Scrutiny Board (RSB) delivered a positive opinion with reservations on a draft of the Impact Assessment on 23 March 2018 after the meeting on 21 March. The following table gives an overview of its main comments and how they have been addressed in the report.

RSB Opinion 23.03.2018 : Main comments	**Where and how the comments have been taken into account**
The report does not adequately present the context of the Tyre Labelling Regulation (TLR), e.g. how it works together with the General Safety Regulation (GSR), Energy Labelling Directive and market surveillance frameworks. It does not present the actual and potential contribution of the labelling scheme to the efficiency and safety of tyres, beyond the requirements put in place by the GSR.	An explanation of the Energy Labelling Regulation and the Market Surveillance Regulation, and their relevance, has been added to Section 1.2 on page 4. The actual contribution of the TLR has been added to the problem definition on page 7.
The presentation of policy options is not sufficiently clear, nor does it appear to cover the full range of policy issues addressed in the proposal.	The table at the beginning of section 5 (page 15) now presents the all the options, and the presentation of the options in section 5.2 (pages 15-26) has been improved. A new Table 4 has been added (page 28) to summarise the options that were discarded at an early stage and options that were modelled. A more detailed explanation of why Option 4 is the preferred option has been added at page 41 and Table 18 has been made more exact (the mathematical calculations from Table 17 have been translated into half "+" s).
The report calculates impacts using behavioural assumptions that are neither transparently presented nor accompanied by a sensitivity analysis.	A summary of the underlying assumptions of the modelling has been added at the beginning of section 6 (page 29). A sensitivity analysis on the key behavioural assumptions of consumers has been added to section 8 on the preferred option.

Specific objectives are missing, as are a good representation of stakeholder views on the different policy options.	The specific policy options have been added at the beginning of section 4.2 on page 12. Their monitoring and evaluation has been added to section 9. A summary of the views of stakeholders by category (industry, Member States and consumers) has been added to Annex 2. Views of stakeholders, from the consumer survey during the review study and the OPC have been added throughout the text where appropriate.

4. Evidence, sources and quality:
The impact assessment draws on an extensive amount of desk research, external studies, targeted consultations, interviews, focus groups, workshops and other

This impact assessment is based on the findings from the Review Study carried out in 2016[1] and the subsequent Open Public Consultation (OPC)[2] , but with market data updated to 2017. The calculations are based on a stock model, determining the number of tyres of each type (C1, C2, C3) in the EU, which is built on annual sales provided by the European Tyre and Rubber Manufacturers Association, ETRMA, combined with ACEA's (European Automobile Manufacturers Association) annual numbers on vehicles in use in the EU[3]. As part of the 2016 Review Study an extensive stakeholder consultation was performed to assess the efficiency and effectiveness of the label scheme. Stakeholders from across the supply chain were approached to assess their role and whether the TLR was serving its intended purpose. The stakeholder consultation thus included:

- Tyre suppliers;
- Tyre distributors;
- Vehicle suppliers and distributors;
- End users in each tyre segment: C1, C2 and C3.

Interviews and questionnaires were conducted with organisations in each segment, and a more thorough consumer survey was carried out in the largest end-user segment: private car owners of C1 vehicles. The C1 consumer survey included 6,000 respondents, a thousand from each of the following six Member States:

- Germany (~42 million cars)
- England (~29 million cars)
- France (~32 million cars)
- Italy (~37 million cars)
- Sweden (~4.5 million cars)
- Finland (~3 million cars)

[1] http://www.labellingtyres.eu/
[2] See Annex 2 for the results and answers of the Open Public Consultation
[3] http://www.acea.be/statistics/article/Report-Vehicles-in-Use

External expertise was used where necessary, for example the Expert Group on Laboratory alignment for the measurement of tyre rolling resistance under Regulation (EC) No 1222/2009, the International Organization for Standardization, tyre specialists, the European Tyre & Rubber Manufacturers' Association, the Platform for cooperation between National Road Authorities as well as other studies.

https://www.iso.org/standard/65530.html,

https://www.iso.org/obp/ui/#iso:std:iso:23671:ed-2:v1:

http://www.etrma.org

http://www.retyre-project.eu

http://www.transportengineer.org.uk/transport-engineer-news/goodyear-unveils-first-aa-grade-steer-concept-tyre/45469

http://www.cedr.eu

https://www.ecofys.com/files/files/fraunhofer-ecofys-2014-impact-of-ecodesign-energy-labelling-on-innovation.pdf

Annex 2: Stakeholder consultation

The stakeholder consultation took the form of the publication of the combined Evaluation Roadmap and the Inception Impact Assessment for the review of the tyres labelling Regulation in July 2017 and the Open Public Consultation (OPC) that ran from 10 October 2017 to 8 January 2018. The Review study also included an extensive stakeholder consultation, details are given in Appendix 1 to Annex 5.

A. Combined Evaluation Roadmap and Inception Impact Assessment

The roadmap was published on 12 July 2017 with a feedback period till 9 August 2017. Eight feedbacks were received from the following stakeholders:

- Consumer organisations: ANEC and BEUC (Belgium), Deutsche Umwelthilfe e.V. (Germany),
- Company/business organisations: ExxonMobil Petroleum & Chemical B.V.B.A. (Belgium), ENPA & EMMA (Belgium)
- Business associations: Imported Tyre Manufacturers' Association (United Kingdom), BIPAVER (Netherlands), European Tyre & Rubber Manufacturers Association (Belgium), EurEau European Federation of NAtional Associations of Water Services (Belgium)

Stakeholder comments *in extenso* are available at http://ec.europa.eu/info/law/better-regulation/initiatives/ares-2017-3509962_en.

B. Open Public Consultation (OPC)

The Open Public Consultation (OPC) was launched on 10 October 2017 and ended on 8 January 2018 (https://ec.europa.eu/info/consultations/public-consultation-evaluation-and-review-eu-tyres-labelling-scheme_en).

1. OVERVIEW OF THE RESPONDENTS TO THE OPC

70 responses were received. 20 respondents identified themselves as citizens/consumers (one anonymous), 7 identified themselves as representing commercial tyre business, and 44 identified themselves as working for either an interest organisation or local/national authority (one anonymous). In addition, one stakeholder provided only a written statement (The Association of European Radios). See the list of stakeholder respondents in Table 1.

Table 1 Overview of stakeholder respondents

CATEGORY	STAKEHOLDER ID	MEMBER STATE
Tyre suppliers	1. Apollo Tyres	International
	2. Continental Reifen Deutschland GmbH	Germany
	3. ExxonMobil Petroleum & Chemical BVBA	International
	4. Goodyear Dunlop Tires B.V.	Netherlands
	5. Michelin Nordic AB	Sweden

	6. Nokian Tyres Plc	International
Retailer	7. BOVAG	Netherlands
Market surveillance authority	8. Swedish Energy Agency in cooperation with other agencies	Sweden
	9. Swedish Transport Agency	Sweden
Member State government	10. Federal Ministry of Environment	Belgium
	11. Ministry of Infrastructure and Water Management	Netherlands
Member State regional or local government authority	12. City of Helsinki	Finland
	13. DCMR EPA/EUROCITIES	Netherlands
	14. Federal Office for the Environement (FOEN)	Switzerland
	15. Gemeente Den Haag	Netherlands
	16. The City of Oslo, Department for Urban Environment	Norway
Non-governmental organisations representing societal interests	17. ACP Automóvel Clube	Portugal
	18. Allgemeiner Deutscher Automobil Club e.V. (ADAC e.V.)	Germany
	19. ANEC and BEUC	EU
	20. Association of Austrian Newspapers	Austria
	21. Association of Dutch Water Companies and the Association of Dutch Water Authorities	Netherlands
	22. Austrian Journal and Trade Association (ÖZV)	Austria
	23. Deutscher Verkehrssicherheitsrat e.V.	Germany
	24. European Association for Accident Research and Analysis (EVU)	Austria
	25. European Environmental Citizen's Organisation for Standardisation	EU
	26. Fédération Internationale de l'Automobile (FIA Region I)	Luxembourg
	27. Quercus ANCN	Portugal
	28. The European Environmental Bureau	EU
	29. Transport & Environment (T & E)	EU
	30. ZERO - Associação Sistema Terrestre Sustentável	Portugal
Industry organisations	31. Advertising Association	United Kingdom
	32. Advertising Information Group	Germany
	33. BDEW Bundesverband der Energie- und Wasserwirtschaft	Germany
	34. Däckbranschen Sverige AB	Sweden
	35. European association of television and radio sales houses (EGTA)	EU
	36. European Caravan Federation	Germany
	37. European Magazine Media Association and European Newspaper Publishers' Association (EMMA& ENPA)	EU
	38. European Tyre & Rubber Manufacturers Association (ETRMA)	EU
	39. German Insurance Association (GDV)	Germany
	40. Nordic Logistics Association	Norway, Denmark, Sweden
	41. Swedish Water and Wastewater Association	Sweden
	42. The Danish Chamber of Commerce	Denmark
	43. The European Federation of National Association of Water Services (EurEau)	EU
	44. Verband der TÜV e.V.	Germany
	45. Wirtschaftsverband der deutschen Kautschukindustrie e.V.	Germany
	46. Zentralverband der deutschen Werbewirtschaft ZAW e.V.	Germany
Other	47. Commodity producer for tires	Germany
	48. Solvay Silica (Manufacture of silica for the tire industry)	Belgium
	49. Type Approval Authority	Netherlands
	50. Water supply plant	Finland
Citizens / consumers	20 respondents identified themselves as citizens and/or private consumers	

Respondents mainly originate from northern/western European countries which are not fully representative of the whole European Union. However it provides some basis for full extrapolation to the rest of EU-28 countries.

2. OVERALL RESULTS

The first part of the questionnaire (question 7 to 10) covered the respondent's opinion on and experience with the current tyre label. **A clear majority of respondents found the label useful and helpful when making a purchasing decision** and 83% of respondents found an EU-wide label covering all EU countries a good thing. Understanding the label and its parameters is essential in order for the label to have its intended effect. For people having problems understanding the label parameters, the external noise parameter was the most difficult. 77% did not have any problem understanding any label parameters. 29% considered the wet grip parameter the most important, compared to 16% for rolling resistance and 4% for external noise.

The awareness of the label is high, and a majority of respondents had seen the label in use when purchasing tyres. However, this may be expected given the high share of stakeholder respondents and the results should therefore not be used as a general consumer opinion. 43% did not even see the label beforehand in relation to their last tyre purchase. Either they have purchased through an online shop, which is not covered by the regulation, or the physical shop simply did not have the tyre on display and had to order from stock, in which case the consumer will only see the label when receiving the tyre. A final possibility is that the dealer simply did not comply with the regulation, hence not showing the label.

The second part of the questionnaire (question 11 to 21) covered the respondents' opinion on measures and parameters which could improve the current label. Other safety parameters such as snow and ice grip were considered important to include by the respondents, but opinion was divided whether this information should be mandatory or voluntary. The emphasis on safety parameters is consistent with respondents finding the wet grip parameter the most important in the current label, oppose to environmental and economic parameters such as rolling resistance and external noise. 67% of respondents agreed that re-treaded tyres should be included in the labelling scheme, but only if a reliable methodology can be developed. Opinion was divided on whether studded tyres should be included. The possible reason is that this tyre type is not widespread throughout the EU and therefore only relevant in some countries.

Only 21% believed abrasion was an important parameter to include, the remaining respondents considered it more appropriate to regulate abrasion through other forms of regulation or only include it if accuracy of measurements can be ensured. A slight majority were against mileage being included in the label and respondents in favour emphasized the need for an accurate and economically viable testing method.

The consensus was a need to improve awareness of the label through awareness campaigns, mandatory online labelling, and labelling of OEM[4] tyres. To improve **consumer confidence**, respondents agreed on increasing market surveillance and creating a better platform for the authorities to enforce and coordinate activities. Almost all respondents were in favour of establishing a digital registration database. Another measure to improve confidence would be by introducing third-party verification of tyre

4 Tyres sold on the Original Equipment Market (i.e. with a new vehicle)

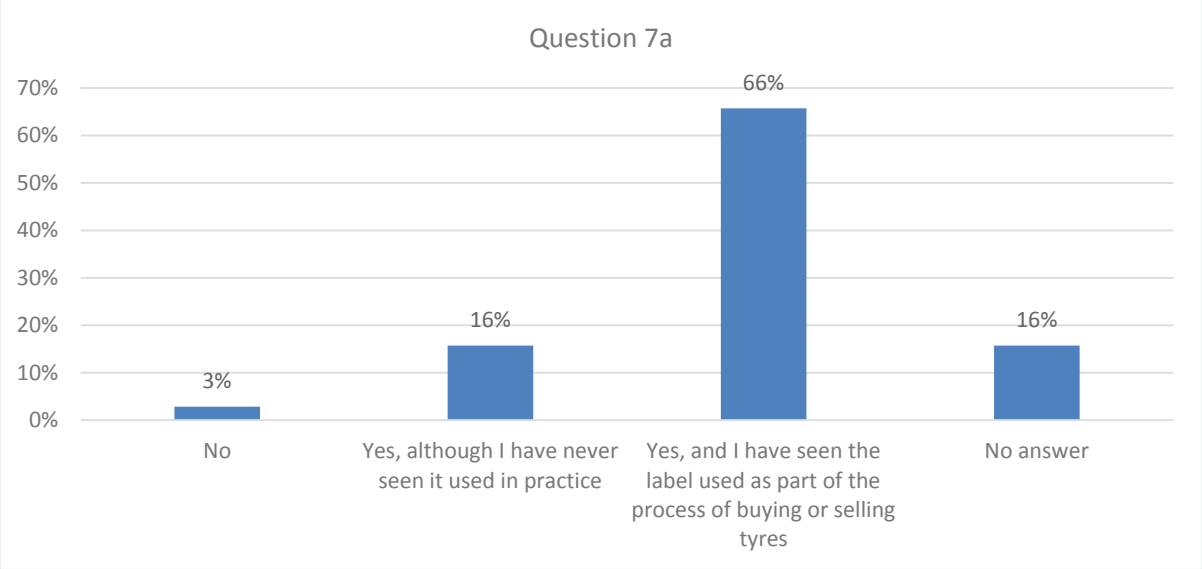
test results. It was widely agreed by the respondents that this would improve confidence and should be made mandatory.

3. DETAILED RESULTS

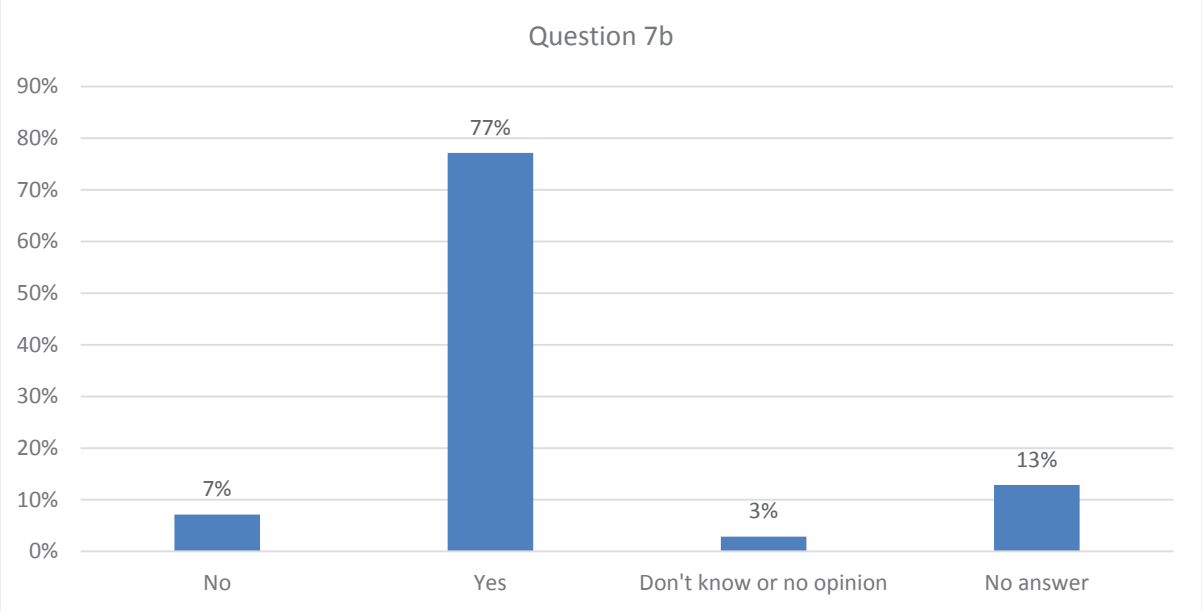
As described in the previous section, the first part of the questionnaire covers the opinion on and experience with the current tyre label used in the evaluation. The second part covers opinion on improvements and additions for a revised regulation subject to this impact assessment. Relevant comments have been selected for each theme. Full comments from all respondents are listed in the end of the annex. Comments from respondents wishing anonymity have been excluded. Questions and selected comments have been themed as follows.

3.1. EVALUATION OF EXISTING TYRE LABEL

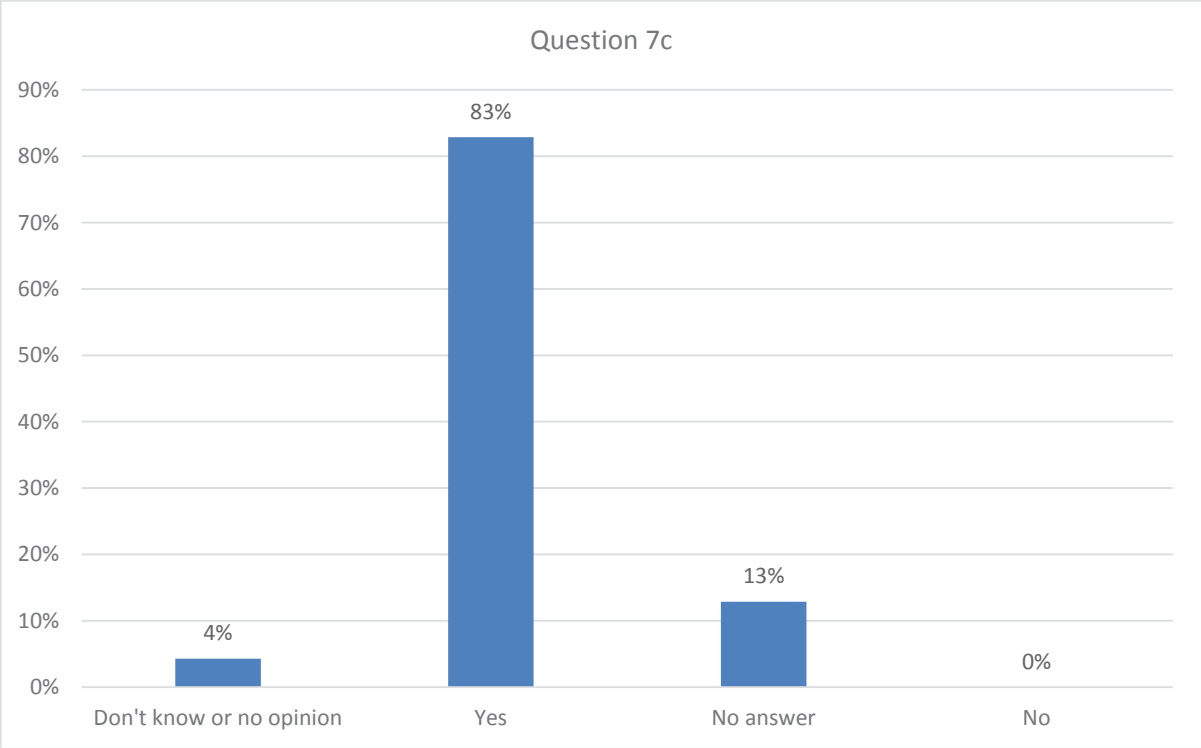
Question 7a: Are you aware of the EU labelling scheme for tyres?



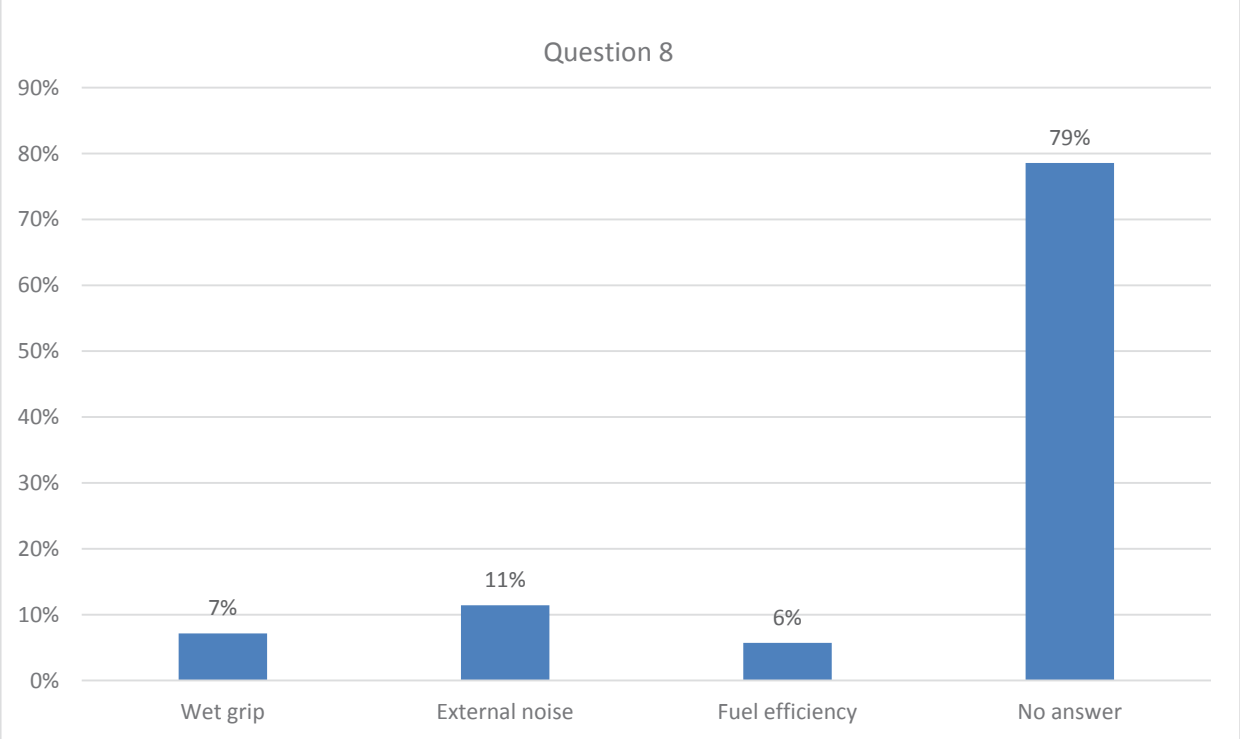
Question 7b: In your opinion, is the label a helpful piece of information when deciding which tyres to buy?



Question 7c: Do you think it is a good thing that a single EU-wide label covers tyres sold in all EU countries?



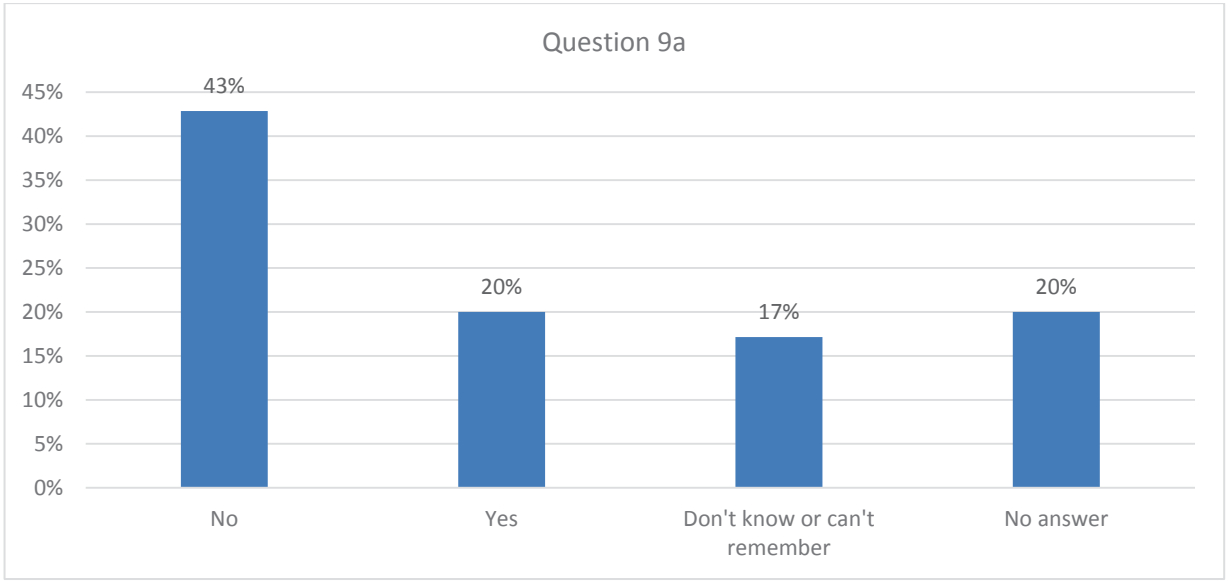
Question 8: **Clarity of label.** The study found that some consumers did not understand the pictures on the label representing different characteristics of the label (see images below). Which, if any, of the images below do you think is difficult to understand?



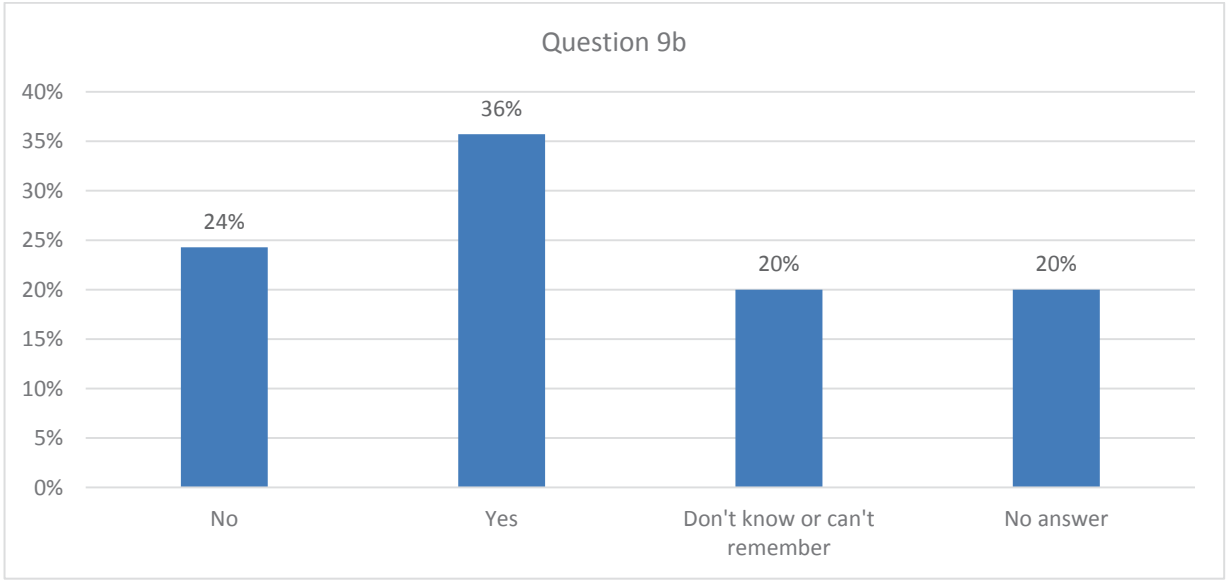
Please tick the box(es) above the image(s), if difficult to understand:

Figure_1_-_Fuel_efficiency_pictogram.png	Figure_2_-_Wet_grip_pictogram.png	Figure_3_-_External_rolling_noise_pictogram.png
		

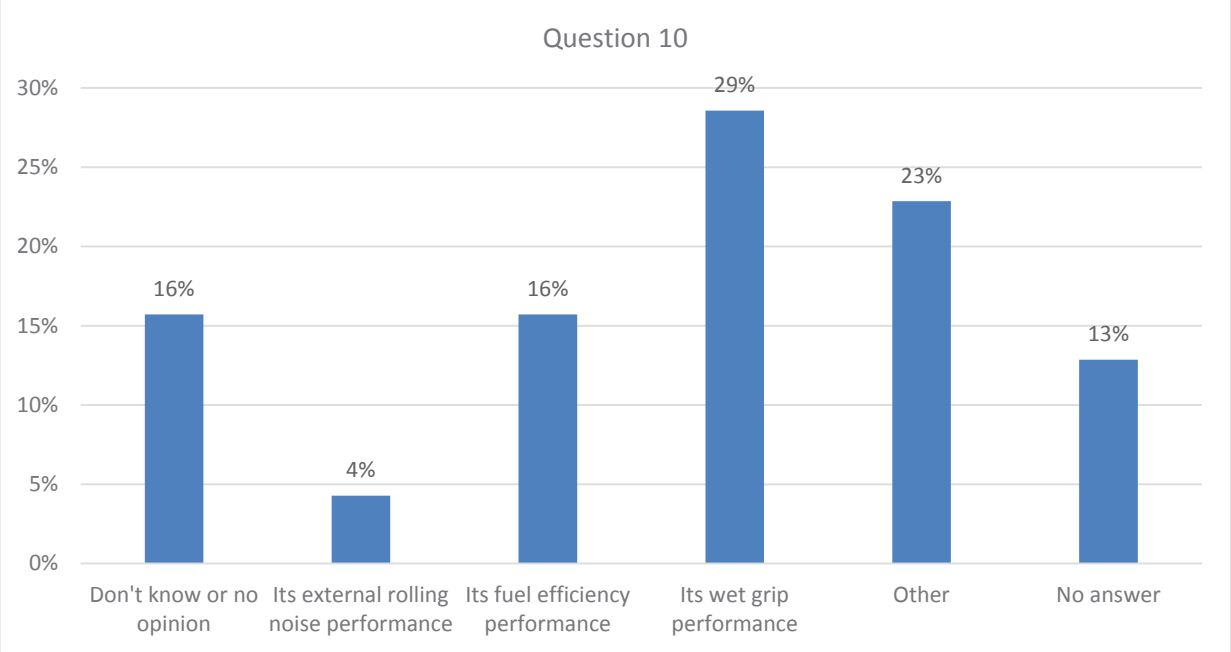
Question 9a: When purchasing your last tyre, did you see the tyre itself beforehand?



Question 9b: Did you see the EU label?



Question 10: **Relative importance of label characteristics.** Which of the tyre's characteristics currently shown on the label do you consider to be the most important when purchasing a tyre?



Comments on question 10

Respondent ID	Respondent category	
Fazilet Cinaralp	An organisation representing industry views	All three performances are key for informed decision by the consumer.
Stephan Rau	An organisation representing industry views	All three performances are key for informed decision making by the consumer.
Jos de Gier	An organisation representing industry views	Most important Wet Grip, secondly RR and less Noise. Overall, these key performances are a good basis for a well-founded buy-decision.
Christoffer Greenfort	An organisation representing industry views	Road safety performance.
Soren Larsen	An organisation representing industry views	We believe fuel efficiency, wet and winter grip and noise are important characteristics.
Martina Petkova	A business manufacturing or involved in the trading of tyres	All three performances contribute to increase the safety as well as the economic and environmental efficiency of road transport and are thus equally important. Consumers should decide based on needs.
Susanne Buchholz	A business manufacturing or involved in the trading of tyres	As in tyre development various performances need to be balanced, it is important to show at least two conflicting characteristics - e.g. fuel efficiency (environment) and wet grip (safety).
Andrew Bassett	A business manufacturing or involved in the trading of tyres	A critical parameter is absent that affects all aspects of tire performance: air retention. This parameter could be accounted for without necessarily being

		shown as an additional label criterion.
Hans Norén	Swedish Transport Agency, regulatory authority for tires (MSA)	Ice grip.
Schneuwly Dominique	A Member State regional or local government authority	One characteristic is only valuable if the others are visible too.
Johan Sliggers	A Member State government	It is customer choice what characteristic he finds most important. In the tyre awareness campaign in the NLs the choice is often safety (wet grip).
Marina Lukovnikova	A Member State government	We provide the answer as the authority, not as a consumer. All parameters are important, in different aspects.
Guido Gielen	A non-governmental organisation representing societal interests (for example, environmental or consumer interests)	1) Its wet grip performance; 2) wear/life and 3) price seem to be the most important considerations for many
	Citizen/consumer (NL)	All three characteristics, as well as the wear factor.
	Citizen/consumer (IT)	Its grip on dry surfaces, its grip on wet surfaces and its performance in terms of fuel economy.

General comments related to evaluation of existing tyre label

ANEC/BEUC (Consumer association): *"External rolling noise performance does not deliver useful consumer information."*

FOEN (Member State regional or local government authority):*"Reconsider noise pictogram (smileys? :-) / :-I / :-(, add colour?)"*

3.2. POSSIBLE IMPROVEMENTS AND ADDITIONS

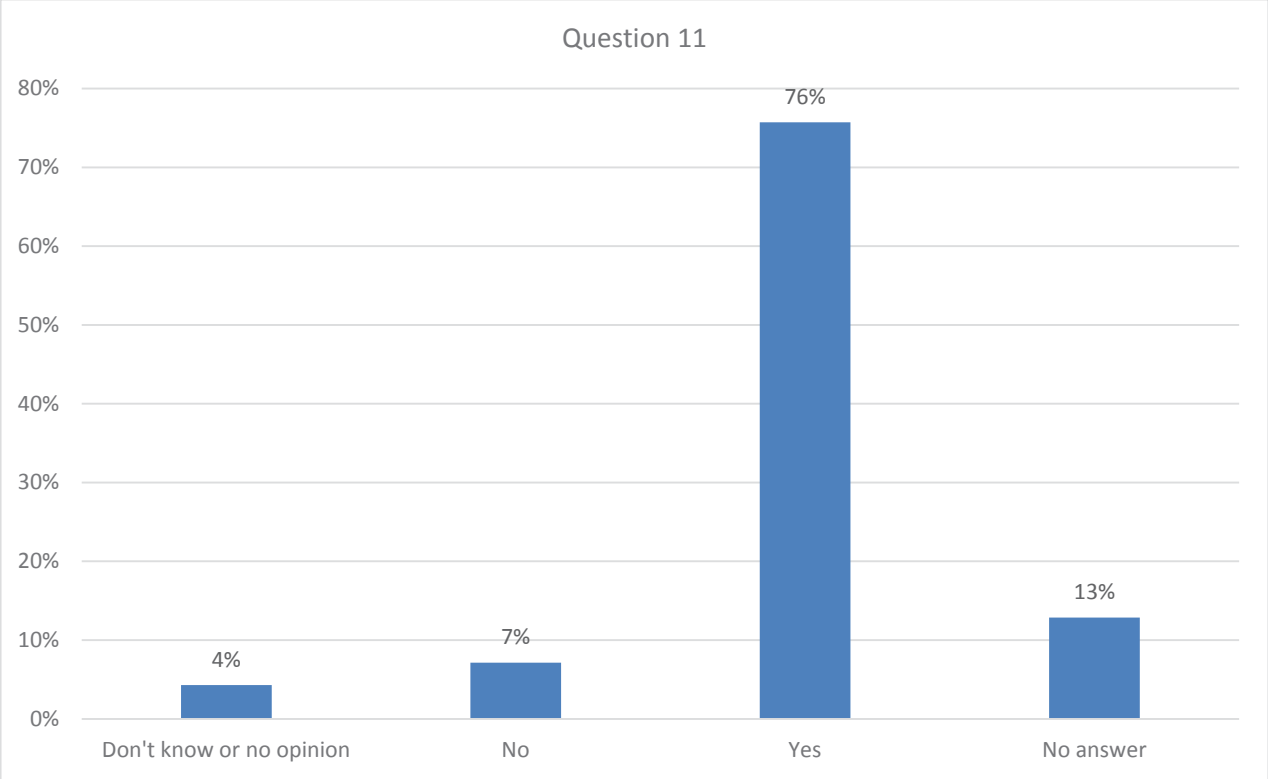
3.2.1. Awareness and online labelling

The following table gives an overview of the answers provided by each main stakeholder group regarding awareness raising and online labelling. Detailed answers can be seen after the summary table.

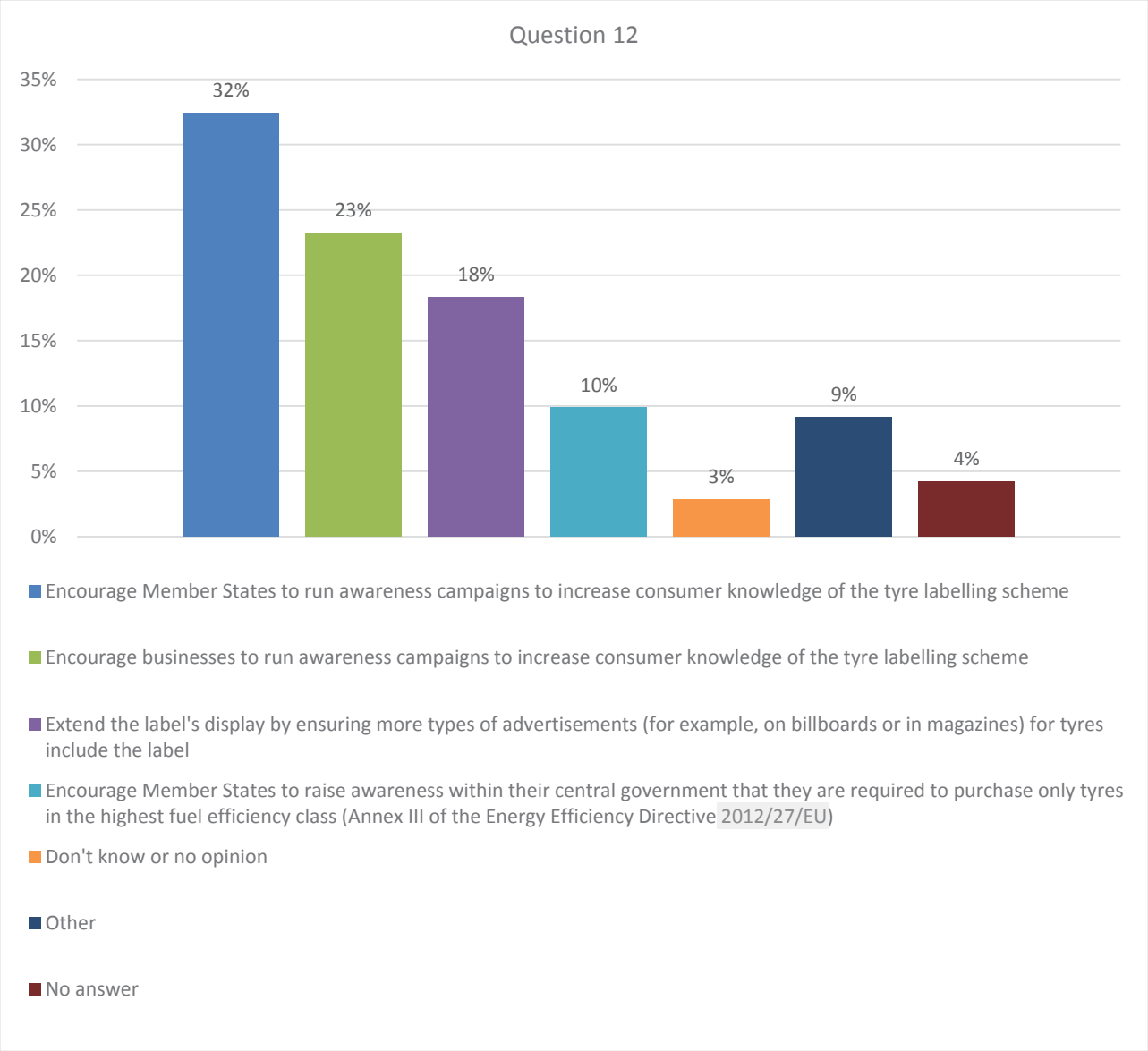
Respondent category	Summary of answers
Industry	Most of the respondents representing industry agree that label information should always be provided before purchase, also by businesses selling vehicles. To improve the awareness of the label they believe the most beneficial option would be to encourage Member States to run awareness campaigns and that online labelling would improve the visibility of the label.
Governmental organisations	Most of the respondents representing governmental organisations agree that label information should always be provided before purchase, also by businesses selling vehicles and that online labelling would improve the visibility of the label. Regarding how to improve the awareness of the label the governmental organisations have no preferred option as their answers are divided on different suggestions.
Non-governmental organisations	Most of the respondents representing non-governmental organisations agree that label information should always be provided before purchase, also by businesses selling vehicles. To improve the awareness of the label they believe the most beneficial option would be to encourage Member States to run awareness campaigns and that online labelling would improve the visibility of the label.
Consumers	Most of the consumers agree that label information should always be provided before purchase, also by businesses selling vehicles. To improve the awareness of the label they believe the most beneficial option would be to encourage Member States to run awareness campaigns and that online labelling would improve the visibility of the label.

Survey results:

Question 11: **Information on all tyres.** The study found that most people are not offered a choice of tyres when purchasing a vehicle. Do you agree that businesses selling a vehicle should always provide tyre labelling information for the tyres fitted on that vehicle, including in situations when the customer is not given a choice of tyres?


Question 11
80%
70%
60%
50%
40%
30%
20%
10%
0%
4%
7%
76%
13%
Don't know or no opinion
No
Yes
No answer

Question 12: **Raising awareness.** The study found that some consumers and organisations were not aware of tyre labelling or the benefits of investing in fuel-efficient tyres. Which of the following options (if any) would you like to see included in the Regulation in order to raise awareness?

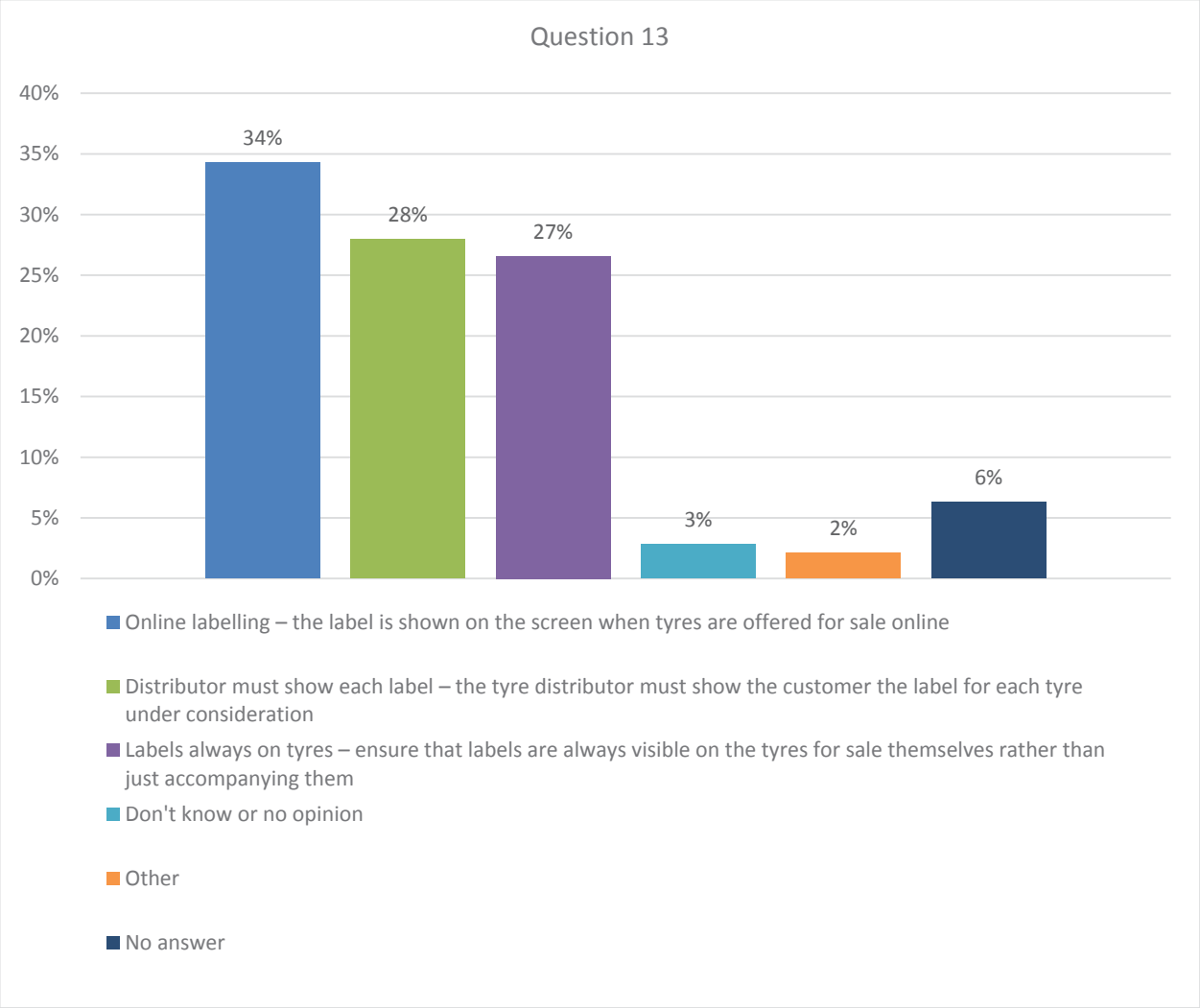


Comments on question 12

Respondent ID	Respondent category	
Bertrand Vallet	An organisation representing industry views	Microplastics release during the use phase
Soren Larsen	An organisation representing industry views	Marking 3PMSF for winter tyres, tested in accordance with UNECE R117 Annex 7. And categorise tyres in general: A, B, C...
Ines Nitsche	An organisation representing industry views	There should be no extension of the system to other types of advertising media as this would threaten the refinancing of the media and thus the editorial reporting.
Katja Heintschel von Heinegg	An organisation representing industry	Under no circumstances should the requirement to disclose relevant environmental properties in media advertising be

	views	extended in the course of any revision of the Regulation.
Marie De Cordier	An organisation representing industry views	Raise awareness through more effective provision of information at the point of sales when the consumer is in the process of making a purchasing decision.
Martina Petkova	A business manufacturing or involved in the trading of tyres	Further encourage Member States to offer purchasing incentives for tyres of label grades A-C (rolling resistance, wet grip) and aim for such tyres in public procurement.
Andrew Bassett	A business manufacturing or involved in the trading of tyres	Label criteria should be tested under 'in-use' conditions. Most tyres in the EU don't run at optimum pressure. Consumer confidence will increase if reported performance is closer to actual performance
Johan Sliggers	A Member State government	The NLs is facilitating a campaign to raise awareness of the importance of tyres: www.kiesdebesteband.nl
Schneuwly Dominique	A Member State regional or local government authority	Reconsider information on the tyres (is everything still needed?), add and highlight label data ON tyre.
Guido Gielen	A non-governmental organisation representing societal interests (for example, environmental or consumer interests)	Tyre choice has some influence on fuel economy but tyre pressures and driver behaviour are bigger, more significant factors. Label would need to offer better consumer relevant information
Aline Maigret	An NGO representing societal interests (for example, environmental or consumer interests)	There is a need for campaigns promoting the label but also explaining the meaning of the parameters/logos (including the safety and environmental benefits) especially if new parameters are added.
Verband Österreichischer Zeitungen	Other	Awareness-raising measures are useful, but should be carried out on a private-sector basis, not by additional. Labelling rules relating to advertising media.

Question 13: **Pre-sale provision of information.** The study found that the label is often not visible to customers when they buy tyres. Which of the following options (if any) would in your opinion improve the visibility of the label to customers?



General comment related to awareness and online labelling

ANEC/BEUC (Consumer association):*"There is a need for better visibility of the label, hence awareness raising campaigns are necessary."*

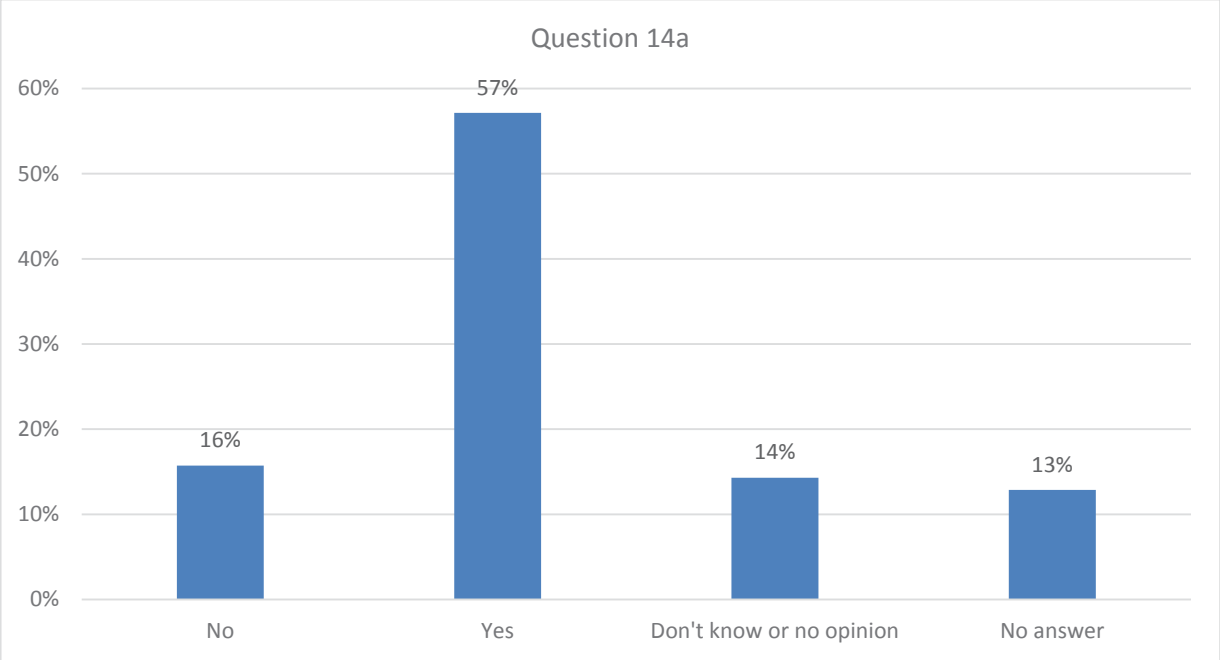
3.2.2. Market surveillance and third-party verification

The following table gives an overview of the answers provided by each main stakeholder group regarding market surveillance and third-party verification. Detailed can be seen after the summary table.

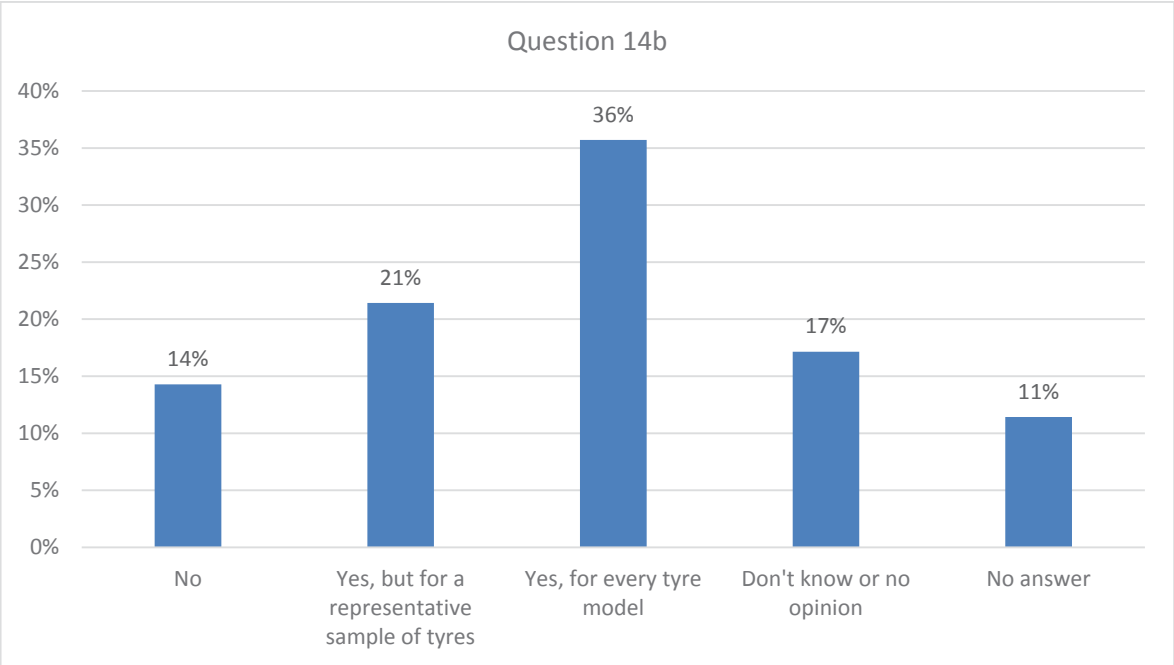
Respondent category	Summary of answers
Industry	The industry respondents are divided in terms of whether third-party verification would improve the accuracy of the information on the label and whether to introduce third-party verification as a requirement. Furthermore, they are divided on how to improve market surveillance and no preferred option for industry can be identified.
Governmental organisations	Most of the respondents representing a governmental organisation believe that third-party verification would improve the accuracy of the information on the label and it should be introduced as a requirement. Regarding market surveillance they believe that better sharing of results between surveillance authorities could improve market surveillance.
Non-governmental organisations	Most of the non-governmental organisation respondents believe that third-party verification would improve the accuracy of the information on the label and it should be introduced as a requirement. Regarding market surveillance they believe it would be beneficial if the wet grip testing is updated and the results between surveillance authorities are shared with the industry.
Consumers	Most of the consumers believe that third-party verification would improve the accuracy of the information on the label and it should be introduced as a requirement. Regarding market surveillance they believe that better sharing of result between surveillance authorities could improve market surveillance.

Survey results

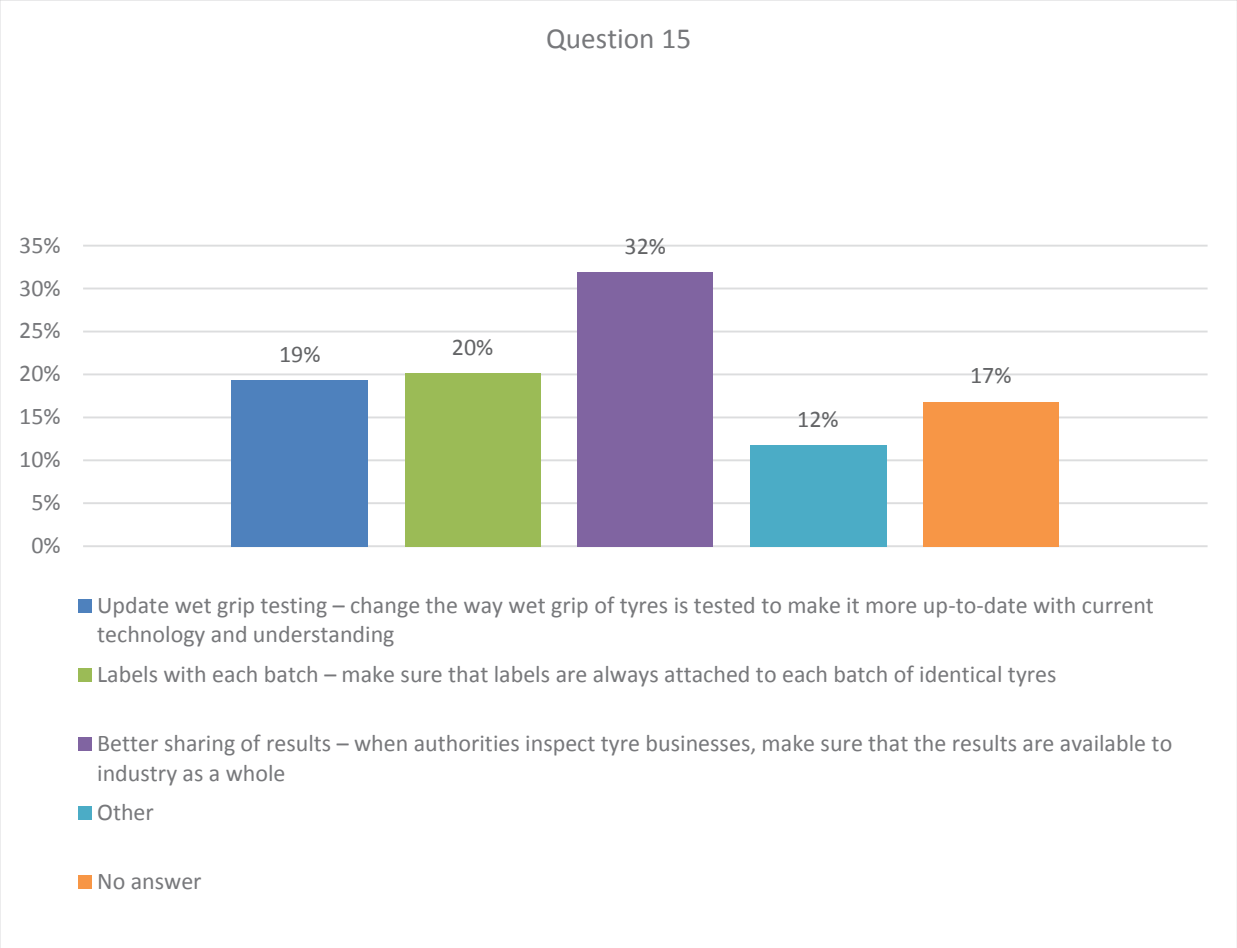
Question 14a: Would you be more confident of the accuracy of the label's information if third-party verification of tyre test results were mandatory?



Question 14b: In your opinion, should third-party verification of tyre test results be introduced as a requirement?



Question 15: **Market surveillance.** The study found that some areas and some Member State authorities were not as good as others at checking if labels were accurate or were being shown to customers. Which of the following options (if any) would in your opinion improve market surveillance?



Comments on question 15

Respondent ID	Respondent category	
Fazilet Cinaralp	An organisation representing industry views	MSAs should build skills and testing capabilities to make regular, more coordinated and more visible enforcement actions through market surveillance. This market surveillance activity should involve all 28 MSAs. Meaningful penalties must be established by Member States in case of non-compliance
Stephan Rau	An organisation representing industry views	MSAs should build up skills and testing capabilities. This to make regular, more coordinated and more visible enforcement actions through market surveillance. This market surveillance activity should involve all 28 MSAs in Europe. Meaningful penalties must be established by Member States in case of non-compliance.
Jos de Gier	An organisation representing industry views	Test spread reduction of the current Wet Grip test, by modifying the test method and/or calculation method for the final result. Meaningful penalties in case of non-compliance.
Martina Petkova	A business manufacturing or	The further development of market surveillance capability and capacity at member state level would best support to improve

	involved in the trading of tyres	market surveillance. The launch of the joint market surveillance initiative MSTyr15 is an excellent tool to enhance a high level surveillance system in Europe.
Susanne Buchholz	A business manufacturing or involved in the trading of tyres	Continental is convinced that market surveillance of label performance through regular spot check testing (not simply verification of documents) with meaningful penalties provide the most effective and efficient tool to ensure reliable labelling and a level playing field. The self-certification requirements reflect the available testing infrastructure. If only third party testing was allowed, this would create unacceptable delays/costs for the tyre industry and disadvantages also to consumers.
Johan Sliggers	A Member State government	On testing: Fuel efficiency and noise get better when tyres wear. This is not the case with wet grip. There, the braking distance increases with wear. The standard for wet grip should include a maximum detoriation for worn tyres. On labels on each batch: every new batch need new testing and possibly a different label On better sharing of test results: make all test data available in an uniform format on the internet. See document Tyres in Europe for more detail.
Henk Wolfert	A Member State regional or local government authority	Maybe tests under real driving conditions could change the order of A-G labels?
Aline Maigret	A non-governmental organisation representing societal interests (for example, environmental or consumer interests)	-A centralised registration database that provides solid information to consumers in order to make an informed choice. As the Commission is setting up a database for the Energy label, the possibility of using it to tyre labelling information should be investigated. -Non-compliant manufacturers should be fined with penalties that are dissuasive and in proportion to the damage caused to consumers and the environment. Several consumer tests have shown discrepancies with manufacturer's test results
Nerea Ruiz	A non-governmental organisation representing societal interests (for example, environmental or consumer interests)	Inclusion on the automotive database
Stephane Arditi	A non-governmental organisation representing societal interests (for example, environmental or consumer interests)	For better sharing of results, go beyond industry and make them available to all, notably by publishing on the automotive database
Laura Carvalho	A non-governmental organisation	Inclusion in the automotive database

	representing societal interests (for example, environmental or consumer interests)	
	Citizen/consumer (NL)	Does enforcement also monitor the values on the label? Perhaps EU-wide joint check and publish results (perhaps à la EURO-NCAP by a consumer organization)
	Citizen/consumer (FI)	Randomly check if the claimed performance on the label matches the performance of the tyres when sold.

General comments related to market surveillance and third-party verification

Consumer: "*[…] it was a suspicion that lower quality brands were not as diligent when obtaining data; this needs to be thoroughly audited in all companies supplying the EU."*

ETRMA (industry organisation):"*Industry does not support introducing independent third party testing of the tyre performance.* [Instead market surveillance should be] *"Increased, more coordinated, more visible enforcement actions through market surveillance is needed."*

ANEC/BEUC (consumer association): *"Market surveillance is not adequately carried out and therefore enforcement of the legislation must be improved. Sanctions must be applied in case of non-compliances."*

Goodyear (manufacturer): "*[…] efforts should be dedicated to further increase awareness and market surveillance efforts. […] A highly developed market surveillance system with regular surveillance activities at Member States' level as well as a meaningful set of penalties is important to ensure compliance with the regulation. […] third party testing might be disproportionate to the available infrastructure of testing institutes/type approval authorities' laboratories, [and] create unacceptable delays and costs for the tyre industry […]"*

FOEN (other):*"Independent testing is needed in order to guarantee some degree of credibility of the label information."*

Verband der TÜV e.V. (industry association): *A label based on the neutrality and competence of a third party organization would make a positive contribution to the confidence of market participants and provide the consumer with a valuable means of orientation, enabling them to compare products realistically. Therefore a system of mandatory confirmation tests such as Conformity of Production (CoP), performed by third-party laboratories, should be implemented.*

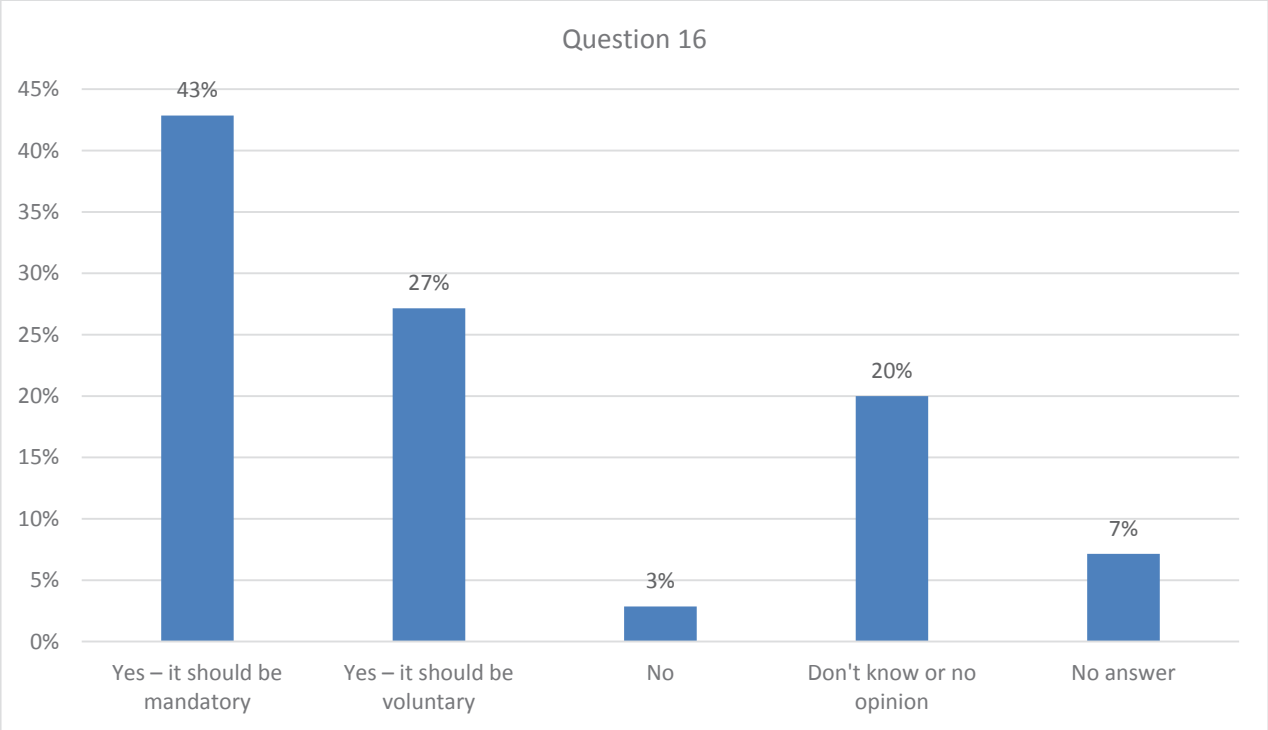
3.2.3. Ice and snow grip

The following table gives an overview of the answers provided by each main stakeholder group regarding ice and snow. The detailed answers can be found after the summary table.

Respondent category	Summary of answers
Industry	The respondents representing industry think that information on snow and ice performance of a tyre should be included in the label, but are divided on whether it should be mandatory or voluntary.
Governmental organisations	The respondents representing governmental organisations think that information on snow and ice performance of a tyre should be included in the label but are divided on whether it should be mandatory or voluntary.
Non-governmental organisations	The respondents representing non-governmental organisations think that information on snow and ice performance of a tyre should be included in the label but are divided on whether it should be mandatory or voluntary.
Consumers	Consumers think that information on snow and ice performance of a tyre should be included in the label as a mandatory requirement.

Survey results:

Question 16: **Snow and ice performance.** The tyre label does not currently include information on tyres primarily designed to perform better in ice and/or snow conditions. Do you think that information on snow and ice performance of a tyre should be included in the label?



General comments related to ice and snow grip

ANEC/BEUC (consumer association):*"Although good grip on icy road is one of the most important characteristic, there is no information on this in the current label. According to a study from Nokia tyres, the wet grip pictogram is misleading in Nordic countries."*

Goodyear (manufacturer):*"[…] either category of winter tyres, i.e. snowflake-marked tyres, and ice tyres (with their future official marking) should be entitled to only one extra logo on the EU label. [and] should be added to the EU tyre label on a voluntary basis […]"*

Solvay (*"To ensure people safety (wet grip) in winter conditions, we recommend to create a Snow and Ice label"*

Swedish Energy/Chemical/Transport Agencies: *"Without complementary information about tyre performance under snowy and icy conditions, consumers could choose the wrong type of winter tyre. This is particularly true when consumers buy tyres on the internet without the possibility of speaking with a representative who can answer questions about the product."*

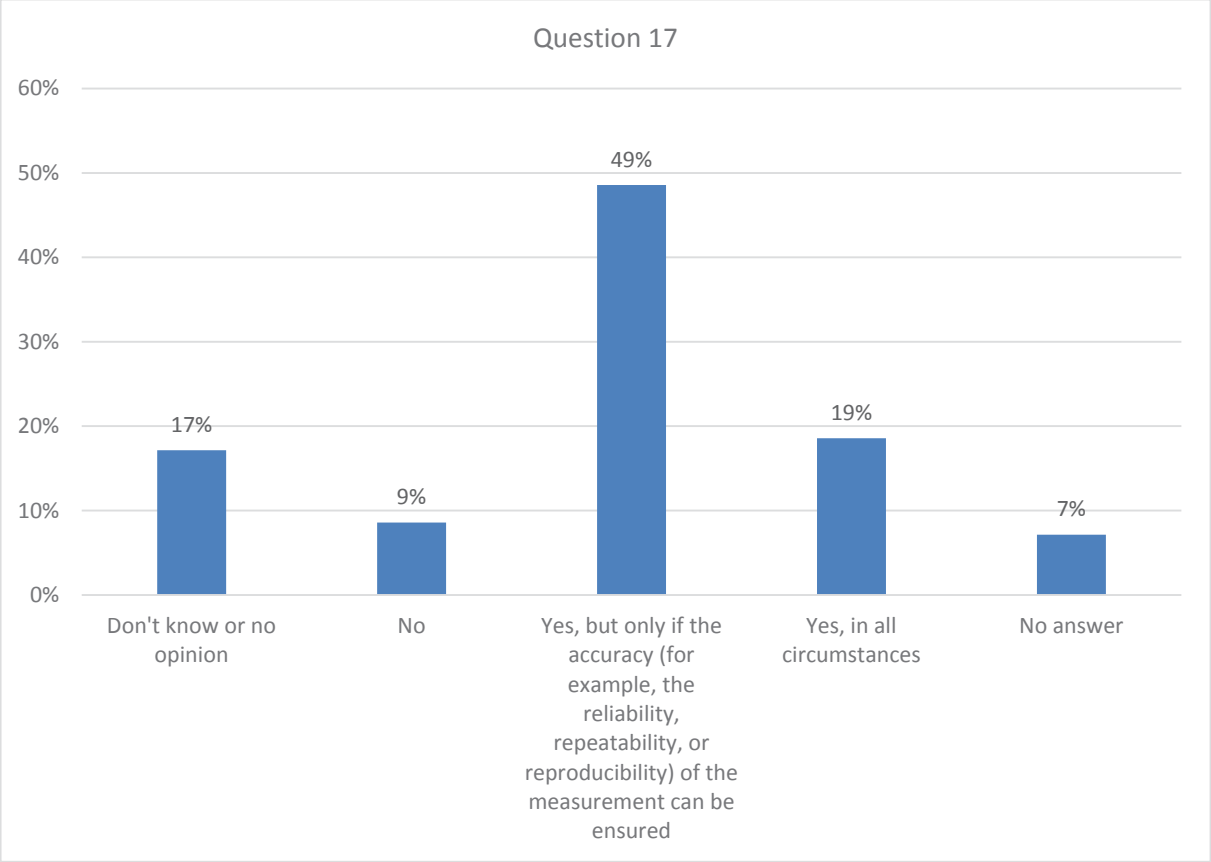
3.2.4. Studded and retreaded tyres

The following table gives an overview of the answers provided by each main stakeholder group regarding studded and retreaded tyres. Detailed answers and question phrasings can be seen after the summary table.

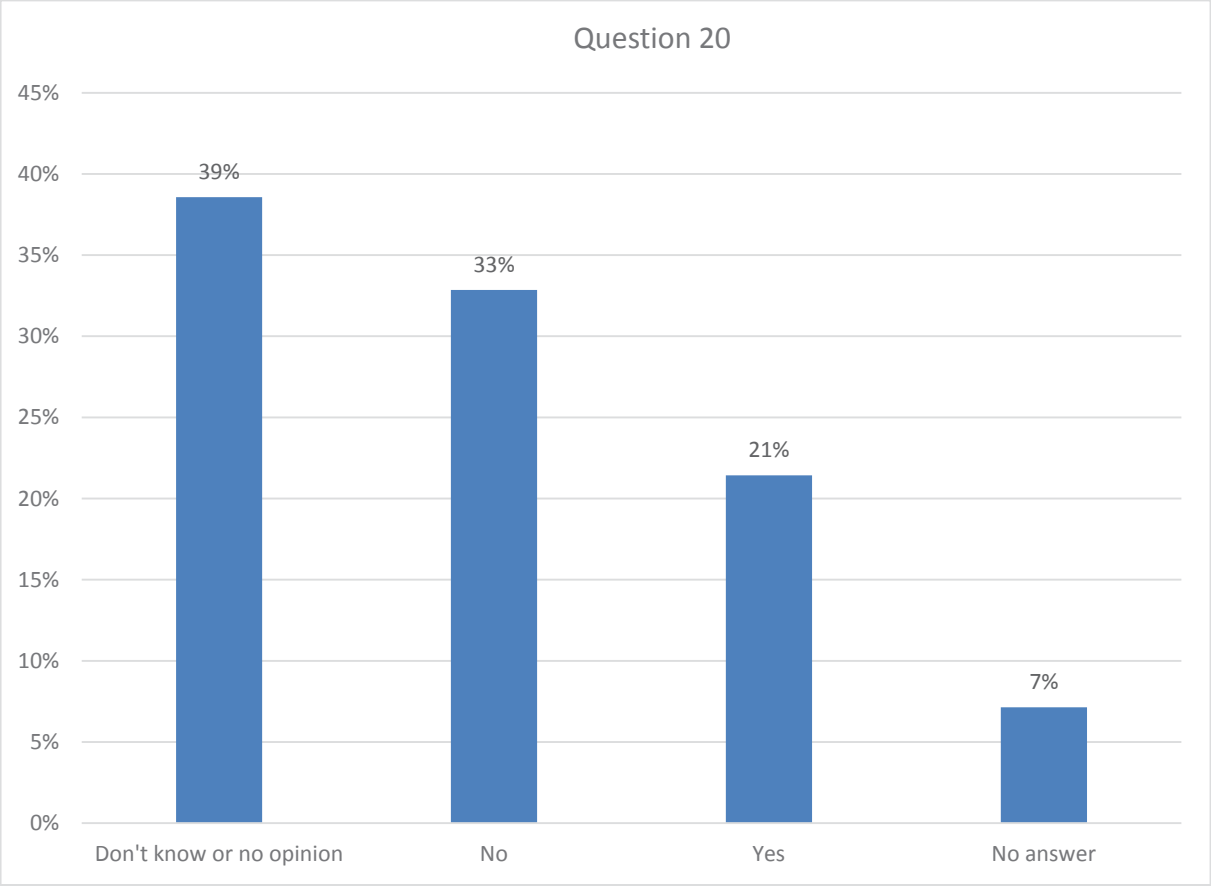
Respondent category	Summary of answers
Industry	Most respondents representing the industry suggest including retreated tyres if accuracy of the measurement methods can be ensured. Regarding studded tyres most industry respondents had no opinion.
Governmental organisations	Most respondents representing a governmental organisation suggest including retreated tyres if the accuracy of the measurement can be ensured, but they do not believe that studded tyres should be included.
Non-governmental organisations	Most respondents representing a non-governmental organisation suggest including retreated tyres if the accuracy of the measurement can be ensured but they have no opinion whether studded tyres should be included.
Consumers	Most consumers suggest including retreated tyres if the accuracy of the measurement can be ensured but they have no clear opinion whether studded tyres should be included.

Survey results:

Question 17: **Re-treaded bus and truck/lorry tyres ("C3")**. Currently, a label is not required for re-treaded tyres. Re-treading tyres can extend the life of used tyres by replacing worn-out tyre tread, contributing to the circular economy. The study found that there was currently no widely accepted method for measuring the fuel efficiency of re-treaded tyres. Should re-treaded tyres be included in the labelling scheme?


Question 17
60%
50%
40%
30%
20%
10%
0%
17%
9%
49%
19%
7%
Don't know or no opinion
No
Yes, but only if the accuracy (for example, the reliability, repeatability, or reproducibility) of the measurement can be ensured
Yes, in all circumstances
No answer

Question 20: **Studded tyres**. The study found that in countries where studded tyres are used frequently, national measures to ensure their safety and reduce their environmental impact already exist. In some EU Member States, studded tyres are banned. In addition, no method exists for comparing studded tyres to regular tyres for fuel efficiency and wet grip. Should studded tyres be included in the labelling scheme?



General comments related to studded and retreaded tyres:

City of Helsinki: *"In Helsinki, 75-80% of C1 and C2 vehicles use studded tyres during winter. This has significant local environmental impacts mainly in the form of elevated noise levels and PM10 dust particles from road and tyre wear. City of Helsinki aims to mitigate the harmful effects of studded tyre use by raising awareness on the matter and providing citizens with fact-based information to help them make more environmentally friendly decisions when choosing winter tyres (non-studded winter tyres over studded tyres). Providing information on snow and ice performance, and possibly abrasion in the tyre label, as well as including studded tyres in the labelling scheme would contribute to that cause."*

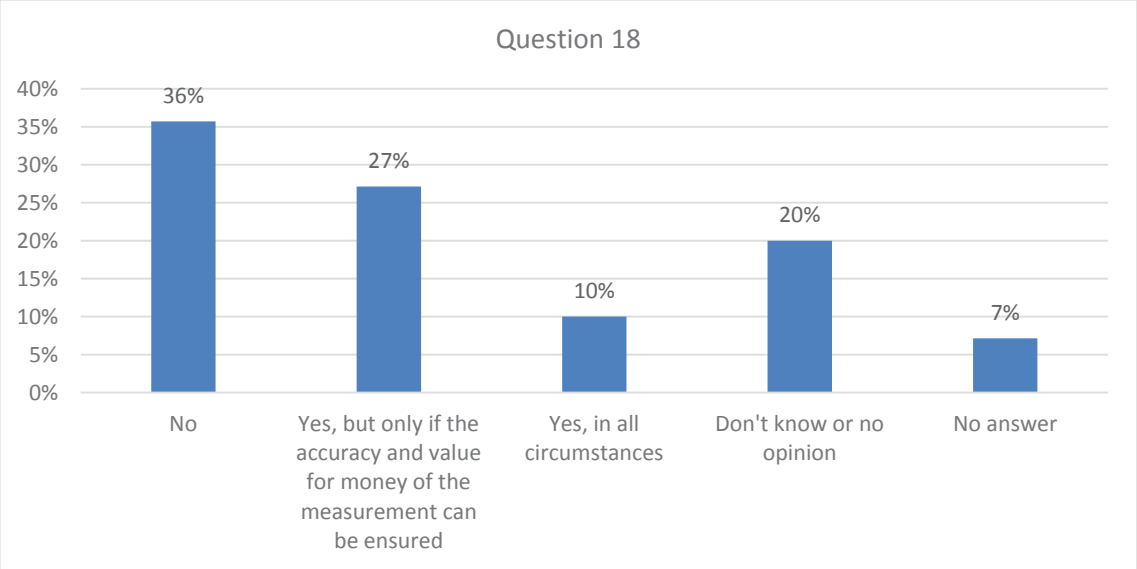
3.2.5. Mileage and abrasion

The following table gives an overview of the answers provided by each main stakeholder group regarding mileage and abrasion. Detailed answers and question phrasings can be seen after the summary table.

Respondent category	Summary of answers
Industry	Most respondents representing the industry do not suggest including mileage information or abrasion information on the label, and there is general agreement that concerns about abrasion are more appropriately addressed through other forms of regulation.
Governmental organisations	Respondents representing a governmental organisation suggest including abrasion information if the accuracy of the measurement can be ensured. The governmental organisation respondents are divided regarding whether mileage information should be included on the label.
Non-governmental organisations	Most respondents representing a non-governmental organisation suggest including both mileage information and abrasion information on the label.
Consumers	The consumers answers are very divided and there is no clear opinion on information on mileage and abrasion on the label.

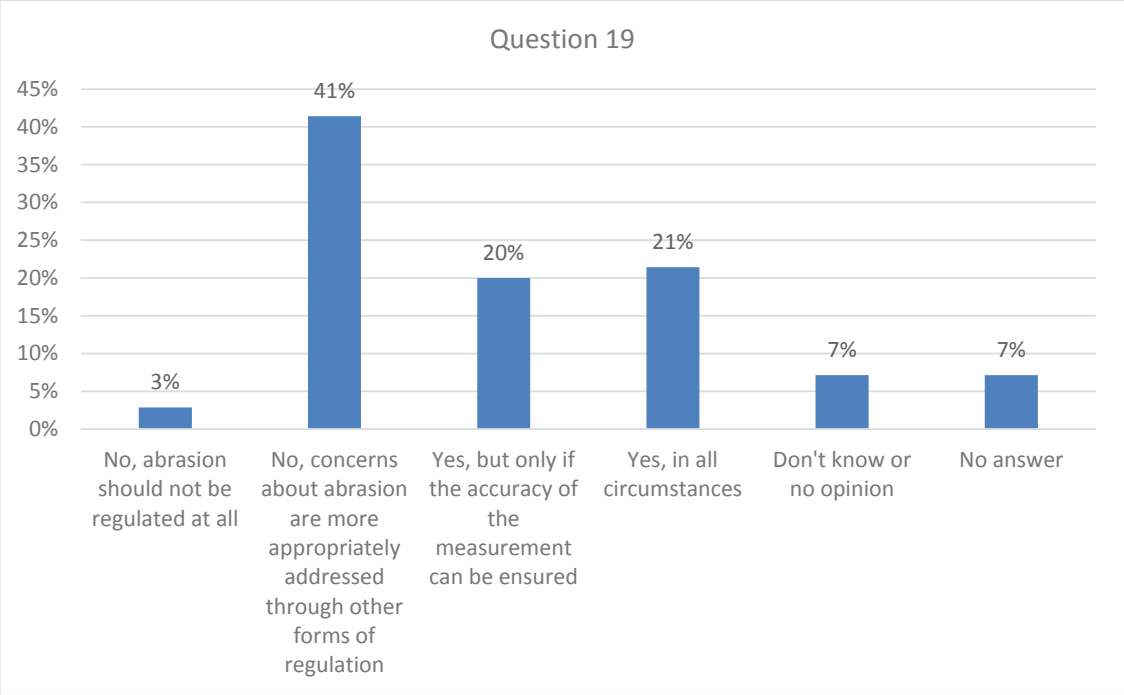
Survey results

Question 18: **Mileage**. Currently, tyre mileage information (the total distance that tyres can be expected to last for) is not included in the label. The study found that mileage in tyres is very difficult to test or monitor accurately. The tests that do exist are expensive and tend to be bad at measuring "real-life" mileage (that is, outside laboratory conditions). Should mileage information be included in the label?



Question 19: **Abrasion and microplastics**. Currently, information about abrasion (the removal of material from the tyre when it interacts with the road surface) is not included in the label. Abrasion contributes to a significant percentage of microplastics (small plastic particulates) in the ocean and to air pollution through so-called tyre road wear particles. The study found that there was currently no accurate way of measuring

abrasion, and that other legislation already exists to regulate the chemical content of tyre materials. Should abrasion information be included in the label?



General comments related to mileage and abrasion

T&E (NGO): *"As regards test methodology on mileage, much progress has been made at UNECE level since the Commission study on the EU Tyre Label was commissioned. […] the Real-world Driving Emissions (RDE) tests recently introduced for cars, it is possible to test tyres' durability in real world conditions and the costs will come down as the tests are more widely used."*

ETRMA (industry organisation):"*ETRMA believes that the labelling scheme is by no means appropriate to address this* [abrasion] *complex question."*

ZERO - Associação Sistema Terrestre Sustentável (NGO):*"If these [mileage and abrasion] parameters are not included in the current regulation, the Commission should now, at the very least, request that robust and representative methods are developed for these parameters."*

The European Environmental Bureau (NGO):*"As regards measurement methodologies not being developed or agreed yet, a mandate should be issued asap to standardisation bodies by EC to make sure this situation will not be perpetuated and used as an argument to not take action in the future. In the meantime, transitional methods could be suggested and/or simple information provided (e.g on abrasion and microplastics)."*

BDEW Bundesverband der Energie- und Wasserwirtschaft (industry organisation):*"Incentives should be created to develop tires with less microplastic abrasion. With regard to microplastic abrasion, grading / differentiation in labelling would be important in order to provide the consumer with information for a purchase decision."* ***[Machine translated]***

EurEau (industry organisation):*"We would highlight that abrasion contibutes to microplastics in WATER RESOURCES, and not directly water supply. Since the tyres are an important source of microplastics emitted to the aquatic environment, the labelling scheme should include microplastics emissions during normal wear and tear as an indicator."*

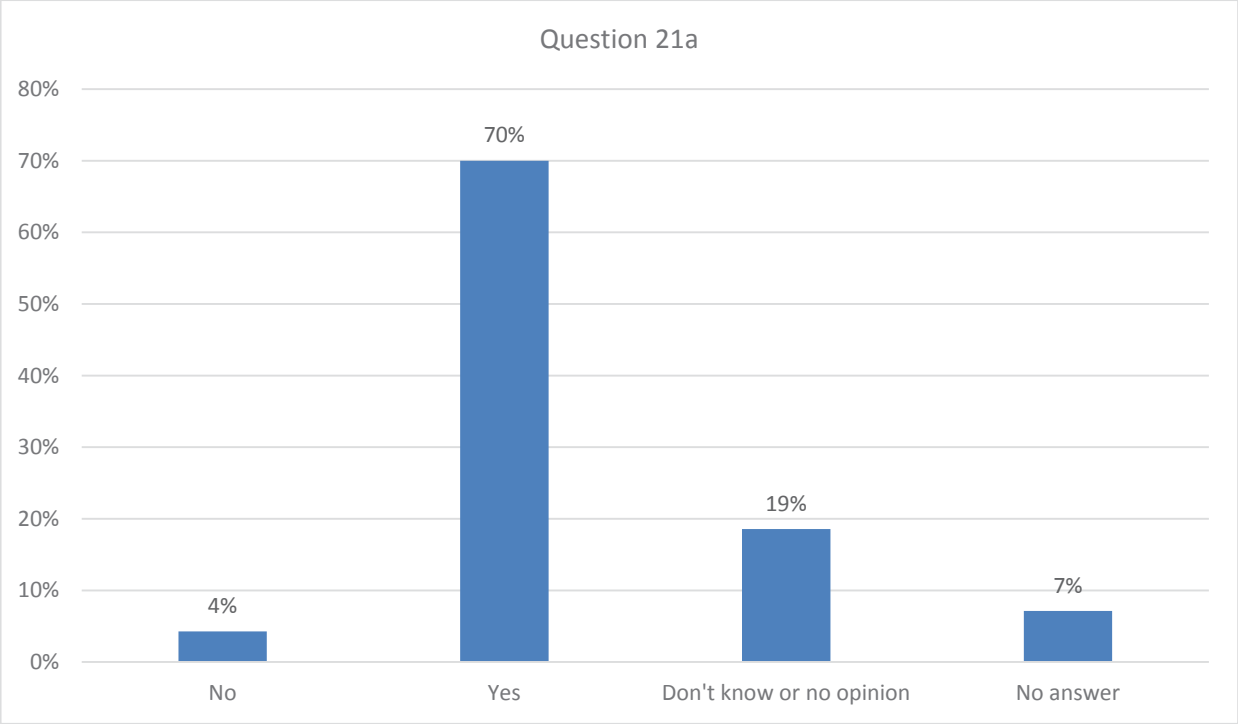
3.2.6. Digital registration database

The following table gives an overview of the answers provided by each main stakeholder group regarding a digital registration database. Detailed answers can be seen after the summary table.

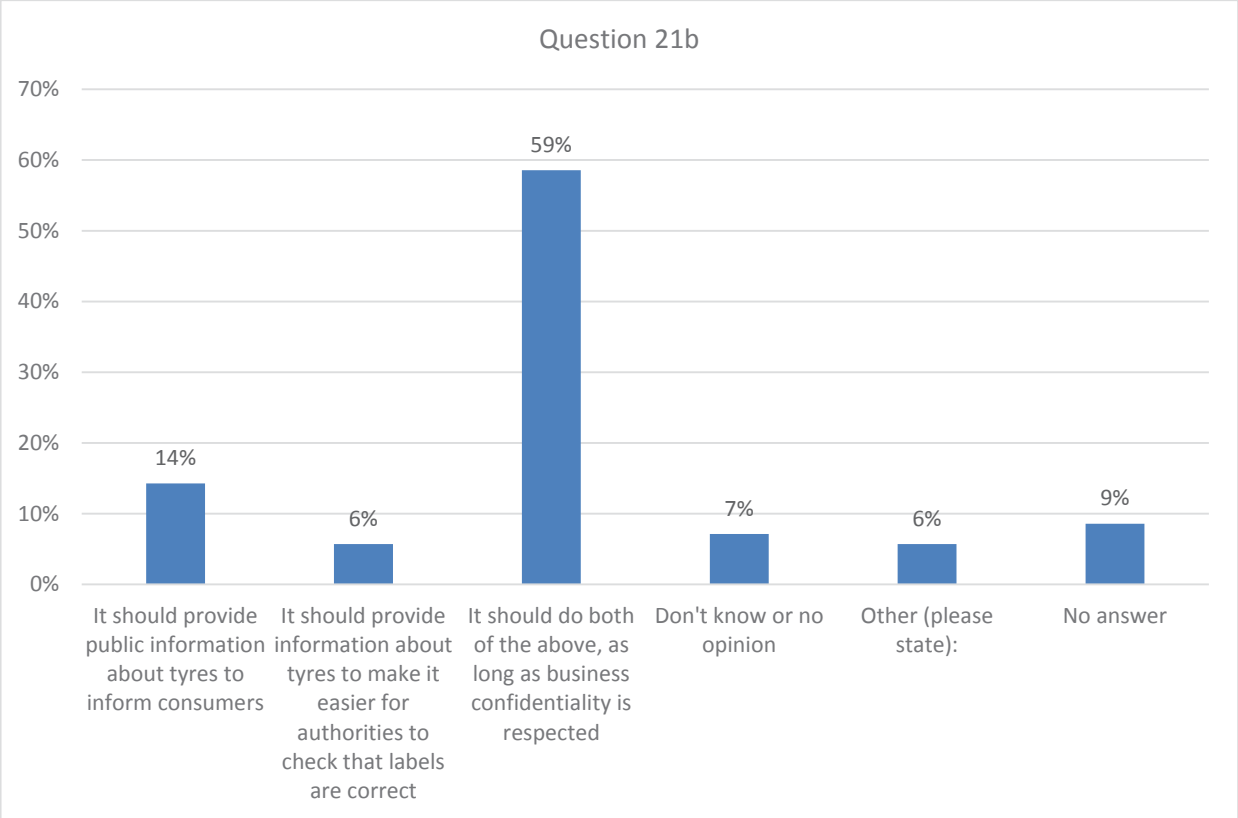
Respondent category	Summary of answers
Industry	The majority of respondents representing industry are in favour of setting up a digital registration database and providing public information about tyres to inform consumers and also provide information about tyres to make it easier for authorities to check that labels are correct.
Governmental organisations	All respondents representing governmental organisations suggest that a digital registration database should be set up and provide public information about tyres to inform consumers and also provide information about tyres to make it easier for authorities to check that labels are correct.
Non-governmental organisations	Most respondents representing a non-governmental organisation suggest that a digital registration database should be set up and provide public information about tyres to inform consumers and also provide information about tyres to make it easier for authorities to check that labels are correct.
Consumers	The vast majority of consumers suggest that a digital registration database should be set up and provide public information about tyres to inform consumers and also provide information about tyres to make it easier for authorities to check that labels are correct.

Survey results

Question 21a: Should a digital registration database providing information about tyres be set up?



Question 21b: If a digital registration database should be set up, what sort of information should it provide?



General comments related to digital registration database

ANEC/BEUC (consumer association):*"The possibility of using the database currently being set up for the EU energy label should be investigated for the tyre labelling scheme."*

Goodyear (manufacturer):*"[…] in light of additional management and administrative cost involved we do not deem it necessary to introduce another database at European level."*

FOEN (Swiss federal office for environment):*"A public database containing data of all sold tyres is needed (for information AND controlling purpose) […]".*

3.2.7. Small and Medium Sized Enterprises (SMEs)s

General comments related to SMEs:

European Caravan Federation (industry organisation):*"Motor caravans are generally built by SMEs using multi-stage builds. The tyres for the completed vehicle are provided as part of the base vehicle and not by the final stage manufacturer. Any requirements for provision of information to the consumer must therefore be carefully considered in respect of these vehicles to ensure that undue burden is not placed onto these SMEs."*

3.2.8. Advertisement

General comments related to advertisement

The Association of European Radios*"AER believes that, especially when it comes to radio, advertising is not the right place to insert detailed information. It does not and cannot provide all information necessary for the final purchase decision. The consumers' decision is based on many other sources, such as brochures and websites, and information collected at the point of sale. […] Consequently, AER calls for the status quo regarding advertising rules contained in the Tyre Labelling Regulation: i.e. no labels or terms and conditions inserted in tyre advertisements in billboards, newspapers, magazines, radio broadcasting, television and similar online formats."*

EMMA/ENPA (industry organisation):*"We would in particular like to comment on the suggestion to extend technical information on tyre efficiency to advertising, specifically in magazines and newspapers. It is our view that a mandatory inclusion of such information would be inefficient and would in the process have negative effects on the value of advertising in both print media and digital media."*

ÖZV (NGO): *"A widening of the requirements for compulsory information in advertisements leads to a situation that makes the advertising as a whole unattractive."* ***[Machine translated]***

European association of television and radio sales houses (industry organisation):*"[…] TV and radio advertisements [..] are not optimal platforms for conveying technical information in a meaningful way to consumers. […] the potential negative impact that mandatory information messages would have on TV and radio revenues could be significant"*

Zentralverband der deutschen Werbewirtschaft (industry organisation):"[The label should be] *made available to the consumer only where he / she takes note of the information in a manner relevant to the purchase decision. This does not usually take place via the media advertising […]"*

3.2.9. Rescaling

General comments related to readjustment:

ETRMA (industry organisation):*"It is considered premature to revise the labelling scale requirements for both wet grip and fuel efficiency, and even noise, while efforts should be dedicated to increase awareness and market surveillance efforts"*

Goodyear (manufacturer):*"Goodyear supports the conclusion of the Viegand Maagoe study stating that it is premature to revise the labelling scale for any of the three tyre label performances […]"*

3.2.10. Testing standards

General comments related to testing standards

"The boundary conditions are too broadly defined (road test surface, temperatures, test vehicle.", "The label says nothing about the absolute, achievable braking distances" **[FIA]**

ExxonMobil Petroleum & Chemical BVBA (tyre supplier):*"A revised rolling resistance coefficient (RRC) standard test and rating that requires RRC average over time vs. a single data point under optimal conditions"*

ETRMA (industry organisation): *ETRMA is recommending introducing the new revised test method* [for wet grip] *at the current planned revision of the tyre label scheme."*

3.2.11. Additional suggestions

Däckbranschen Sverige AB (industry organisation):*"It would be desirable to investigate the possibility of also obtaining information in the tire label regarding performance throughout the lifetime."*

Solvay Silicia*"It is important to monitor how the overall tire performances (Rolling Resistance, Wet Grip, Noise) age during the tire lifecycle (e.g.: performance variation after 10 000 Km, 20 000 Km, above 30 000 Km)".*

ExxonMobil Petroleum & Chemical BVBA (tyre supplier):*"A key aspect is inflation pressure loss rate (IPLR) performance. Specifying tyres with a maximum IPLR of e.g. 2% or 2.5% (which could also be progressively reduced in response to market demands and technology developments) should promote improved IPLR performance of tyres in the EU.*

"The regulation should integrate a clear obligation to manufacturer (supplier) to fulfil compliance evaluation procedure, including periodical control of production."

"The text of regulation may be improved for more clarity. Market surveillance authorities and even laboratories have sometimes difficulties to interpret the text in the same way." **[Federal Ministry of Environment]**

4. *IN EXTENSO* COMMENTS FROM ALL RESPONDENTS

"As an ex-employee of a large tyre company, I know the vast sums of money invested in getting data for these types of test & it was a suspicion that lower quality brands were not as diligent when obtaining data; this needs to be thoroughly audited in all companies supplying the EU." [**Consumer**]

The European Caravan Federation (ECF) is the umbrella organisation representing the national organisations of the European Caravanning Industry. Membership of the ECF consists of 12 caravanning federations and numerous national members of the caravanning industry within the EU member states. These members are involved in the production, the sales and the use of touring caravans, motor caravans and the supply of specialist parts and services to the industry.
Motor caravans are manufactured by small and medium sized manufacturers in quantities from 10 to 10.000 annually.
Motor caravans are generally built by SMEs using multi-stage builds. The tyres for the completed vehicle are provided as part of the base vehicle and not by the final stage manufacturer. Any requirements for provision of information to the consumer must therefore be carefully considered in respect of these vehicles to ensure that undue burden is not placed onto these SMEs. [**European Caravan Federation]**

In Helsinki, 75-80% of C1 and C2 vehicles use studded tyres during winter. This has significant local environmental impacts mainly in the form of elevated noise levels and PM10 dust particles from road and tyre wear. City of Helsinki aims to mitigate the harmful effects of studded tyre use by raising awareness on the matter and providing citizens with fact-based information to help them make more environmentally friendly decisions when choosing winter tyres (non-studded winter tyres over studded tyres). Providing information on snow and ice performance, and possibly abrasion in the tyre label, as well as including studded tyres in the labelling scheme would contribute to that cause. [**City of Helsinki**]

As regards test methodology on mileage, much progress has been made at UNECE level since the Commission study on the EU Tyre Label was commissioned. Thus Question 18 above somewhat prejudges the answers and influences the audience by claiming that the tests are "expensive and inaccurate"; this is a subjective view. Similarly to the Real-world Driving Emissions (RDE) tests recently introduced for cars, it is possible to test tyres' durability in real world conditions and the costs will come down as the tests are more widely used. Most drivers fall within the 70-80% of all driving conditions, and so called boundary conditions to mirror the on-road use can be introduced, as was successfully done in RDE.
As regards question 21 on database, synergies should be sought with the provisions on online exchange platforms agreed as part of the new Type Approval and Market Surveillance regulation - the information on tyres should be added into one common EU database on type approval of vehicles, their parts and components. **[Transport & Environment]**

An ice-labelling mark is very important for the Nordic market ***[Michelin Nordic AB]***

"Although the tyre label is an important tool for consumers across Europe to take an informed decision, there is a need to review the current regulation, and to launch the impact assessment. We reiterate our position:

- the methodology used to define the energy classes of tyres must reflect real life performance, hence providing accurate and transparent information to consumers. Currently, we fear that manufacturers are often using loopholes in the methodology as well as tolerances in order to reach higher energy classes. It is misleading information for consumers. The methodology needs to be updated.

-There is a need for better visibility of the label, hence awareness raising campaigns are necessary.

-Market surveillance is not adequately carried out and therefore enforcement of the legislation must be improved. Sanctions must be applied in case of non-compliances.

-Regarding the current criteria, we believe that wet grip performance is the most important parameter because of its impact on safety. Fuel efficiency performance is important as long as there is no trade-off between rolling resistance and wet breaking because they can put conflicting demands on tyres which should be prevented. Innovation in recent years has shown that it is possible to improve wet grip and fuel efficiency simultaneously. External rolling noise performance does not deliver useful consumer information.

-The range of performance parameters on the label is too limited. The label could be extended to snow and ice grip. Although good grip on icy road is one of the most important characteristic, there is no information on this in the current label. According to a study from Nokia tyres, the wet grip pictogram is misleading in Nordic countries.

-the impact assessment should consider sustainability and that additional comprehensive tyre wear tests are needed.

- the logo representing the parameter must be tested among consumers to ensure the comprehensibility. Overall the whole label should be tested upfront through consumer survey.

- Manufacturers and dealers need to make the label available to consumers before the purchase decision (alignment with the Energy labelling Directive).

- the possibility of using the database currently being set up for the EU energy label should be investigated for the tyre labelling scheme." **[ANEC/BEUC]**

For the parameters where it is indicated that measurement methods do not exist, or are not accepted/reliable, further investigation may be required. If these parameters are not included in the current regulation, the Commission should now, at the very least, request that robust and representative methods are developed for these parameters. Considering that the standardisation community might not be interested in developing those without a request (or may even not have an interest in "widely accepting" methods that are available), such a Commission request would at least attempt to avoid facing exactly the same situation when a future review or revision takes place.
Additionally, consumer understanding of the label should remain a priority, and hence, we invite the Commission to have a consumer understanding assessment, as for other

Energy Labels under discussion. ***[European Environmental Citizen's Organisation for Standardisation]***

The Label aims to encourage the market uptake of energy saving products and aims to encourage the manufactures in technological development. However, the tyre particularity is safety: tyre is the only contact between the vehicle and road. Therefore it is necessary to have a safety performance presented in the EU tyre labelling. Currently it is the information on the wet grip performance of a tyre. Wet grip and ice grip are technically nearly opposite tyre performances and in Nordic winter weather conditions the ice grip is the most critical tyre performance. From this it follows that the Label may offer a wrong view compared to what Nordic citizens need and the consumer may become mislead and buy a wrong tyre for his or hers needs. In this way the winter time road traffic safety is decreased and the inapplicability of the tyre Label may question the credibility of the EU energy efficiency policy in Nordic countries.
The above-mentioned, however, concerns mainly the C1 class tyres. Tyres in class C2 could be added in the scope later when such test method specification has been developed. Tyres in class C3 should be left out of the ice grip marking.
Winter tyre technologies improve road traffic safety and help to decrease the number of traffic accidents. There are big differences between different types of winter tyres. EU Tyre Labelling may create a safety risk in Nordic countries' winter time road traffic. Snow and/or ice grip markings should be added to the EU Tyre Label.
According to the Article 11 of the Reg. EC/1222/2009 it is possible to amend the Regulation to add information regarding ice and/or snow performance through delegated powers of the European Commission. ***[Nokian Tyres Plc]***

"General Comment on Market Transformation: Goodyear supports the conclusion of the Viegand Maagoe study stating that it is premature to revise the labelling scale for any of the three tyre label performances, while efforts should be dedicated to further increase awareness and market surveillance efforts. Tyre development faces a multiple set of customer-oriented performance requirements which often conflict with each other. Tyre technology has been evolving and the EU tyre label has been a driver for that. According to the report from the European Commission (COM 2017-658/final) market penetration for the best energy efficiency classes (A and B) in fuel efficiency and wet grip is still very low (<1% for all tyre types). This reflects that the current scaling system of the three performance categories is already challenging and will remain such in the foreseeable future.

Third Party Verification: A highly developed market surveillance system with regular surveillance activities at Member States' level as well as a meaningful set of penalties is important to ensure compliance with the regulation. In this context third party testing might be disproportionate to the available infrastructure of testing institutes/type approval authorities' laboratories, while not proven as a need from effectiveness and efficiency perspectives. If only third party was allowed, this would create unacceptable delays and costs for the tyre industry, with disadvantages also to customers and end-consumers.

Snow/Ice Performance: When an ice performance test and logo are available, either category of winter tyres, i.e. snowflake-marked tyres, and ice tyres (with their future official marking) should be entitled to only one extra logo on the EU label. This is important to ensure parity in information for users of winter tyres in the Continental part of Europe and in Scandinavia. This is the finding of a consumer survey that Goodyear conducted in 2015 on consumers' reactions to possible winter tyre information on the

official tyre label. An extra logo (either an ice performance or the existing three-peak-mountain snowflake logo) should be added to the EU tyre label on a voluntary basis, provided that tyres pass the legal thresholds for relevant performance, with official test methods.

Registration Database: Consumers already have comprehensive access to tyre label grades through various tools in the current system: physical stickers (for C1 and C2 tyres), and availability of the label grades in the digital systems of tyre manufacturers, distributors, and dealers. Market surveillance authorities already have opportunity to share information on market surveillance initiatives via the existing ICSMS tool. Therefore and in light of additional management and administrative cost involved we do not deem it necessary to introduce another database at European level." **[Goodyear]**

"Independent testing is needed in order to guarantee some degree of credibility of the label information.

A public database containing data of all independently tested tyre with results and divergences (pressure on the manufacturers).

A public database containing data of all sold tyres is needed (for information AND controlling purpose), please check "Swiss solution", established by the TCS (www.tcs.ch): http://www.bfe.admin.ch/energieetikette/00886/04758/05701/index.html).

Label information of each tyre belongs ON that specific tyre: not all the "same" tyres really are the "same" (year or even season/week of the production, country of origin of components, tyres already mounted on new cars SERIOUSLY! vary from the "same" tyres one can purchase…).

IDEA: as manufacturer, you can "certify" your tyre if tested by an independent authority, add shiny symbol to the label.

Reconsider noise pictogram (smileys? :-) / :-I / :-(, add colour?)

Reconsider noise evaluation scheme: make it absolute, not relative to the tyre dimension. Loud is loud, e.g. >71dB. Why should a loud tyre outperform a quieter one just because it's wider? In terms of health annoyance, this makes no sense.

Please NOTE: as long as label values cannot be trusted (aka today's situation), it is impossible to enforce "hard" and efficient measures (e.g. tax cuts)." **[FOEN]**

"Criticism of the EU tire labelling:

Wet grip characteristics: Basically, it can be stated that direct mapping of EU tire label data is not or only partially possible within the ADAC tire test, although the specific test procedures (wet braking from 80 to 20 km / h) are largely similar , This means that the ranking determined in the ADAC tire test by direct comparison of several tire models under identical conditions does not or only partially corresponds to the EU tire label classification of these tires. This highlights a specific weakness of the EU tire label classification method. The manufacturer's own tests of tires for the EU tire label classification cannot be carried out under the same conditions as in the ADAC tire test. The tests are carried out at different locations on routes with different coefficients of friction and under different climatic conditions. Admitted limits are given for the friction coefficients of the roadways and the climatic conditions. Also, the properties of the test tracks were set in relation to each other by means of ring comparisons. Nevertheless, the

allowed differences should be normalized by using correction factors. When comparing the ADAC tire test results with the tire label classifications, it does not always appear to be guaranteed that these corrections to the raw data can adequately compensate for the differences in the framework conditions mentioned. This applies in particular to the correction factors of temperature and road friction coefficient.

Rolling resistance / fuel efficiency: The rolling resistance and fuel efficiency data also show differences between the ADAC tire test ranking and the EU tire label classifications. However, there are sometimes significantly different measuring methods in this test point. While determining the fuel efficiency classification of the EU tire label, the rolling resistance coefficient of the test tire is determined on a certified chassis dynamometer. The ADAC directly measures the fuel consumption of the same vehicle (within one test dimension) with the different test tires under the same conditions, The tires are loaded with 50 to 60%. Regardless of these differences in measurement methods, it remains to be proposed to reduce the tire load in rolling resistance measurements from the current 80% to a more realistic 50 to 60%." **[ADAC]** ***[Machine translated]***

As a representative of the media industry, we are fundamentally critical of labelling requirements insofar as they concern advertisements. In recent years, such EU legal acts have repeatedly intervened in protected fundamental rights positions - the right to freedom of communication and the right to freedom of occupation - by compelling the advertising industry to provide compulsory information on all kinds of products. A widening of the requirements for compulsory information in advertisements leads to a situation that makes the advertising as a whole unattractive.

If the European Commission considers that there is a need for media education to promote tire labelling, this should not happen again as a result of the burdensome media industry. Even if labelling requirements in technical advertising media can make sense in order to provide interested consumers with information about the product, they must by no means be extended to classic advertising media. In our opinion, e.g. also the creation of an online database (see question 21), where all relevant information for consumers can be retrieved, an appropriate measure to relieve the provisions on compulsory disclosures.

A more fundamental, proportionate and, on top of that, strengthening the European media sector's access to awareness raising and information for citizens would also be information campaigns by the European Union or its member states on classical media channels on a private-sector basis. ***[Verband Österreichischer Zeitungen] [Machine translated]***

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A more fundamental, proportionate and, on top of that, strengthening the European media sector's access to awareness raising and information for citizens would also be information campaigns by the European Union or its member states on classical media channels on a private-sector basis." **[Österreichischer Zeitschriften- und Fachmedienverband (ÖZV)]** ***[Machine translated]***

The evaluation and update of the Regulation on Tyre labelling is closely linked to the Regulation on General Safety (EC no 661/2009). In the Regulation on General Safety the tyre limits for fuel efficiency, wet grip and noise are set. In July 2017 the Netherlands ministry of environment sent a letter to 4 director generals of the European Commission asking to start working on strengthening of the tyre limits and interest the Commission to a number of other tyre related issues among which improving the tyre label.
Q 7b: The information on the label is limited to letters and colours. One of the reasons to start an public awareness raising campaign in the Netherlands is that the label gives very little information. We propose more information on the label to encourage a discussion between people buying tyres and retail. See the background document 'Tyres in Europe' that was attached to the letter to the Commission for an example how this can be done. Having a label as proposed by the Netherland would almost make the campaign redundant.
Q 9a/b: In the Netherlands the tyre label is mandatory both in the shops and on the internet. That is not a problem. Another thing is whether garages/workshops advise people when their car is brought for inspection/maintenance and new tyres are necessary. Then usually just a phone call is made and information on label values is not transmitted. The customer would in most cases not be informed about the tyre label of the new tyres when picking up the car.
Q 16: See the background document Tyres in Europe attached to the letter to the Commission for an example how this can be done.
Q 18: The Netherlands is greatly concerned about microplastics in the environment. We do favour a limit on abrasion of tyres but not on mileage. And we would like to see a proposal for that from the Commission. Yet, we are very reluctant to put anything on the tyre label. The most important argument would be that the consumer would look at any indicator regarding wear/durability/abrasion as an indicator for mileage. Tyre manufacturers could get a better label when they increase the tyre tread. And as a result the emission of microplastics would increase. See for more details the document Tyres in Europe.
*Q 19: See the comment to Q 18 above. An argument of a lesser importance is that the label would be more difficult to understand and to interpret. Including an indicator for snow/ice (see answer to Q16) would make five indicators on the label. A5th indicator on the tyre label would be too much information. "***[Dutch Ministry of Infrastructure and Water Management]**

"Tyre labelling scheme should follow the same rules as any other energy label, notably be tested on consumers to check proper understanding when being designed/reviewed.

As regards measurement methodologies not being developed or agreed yet, a mandate should be issued asap to standardisation bodies by EC to make sure this situation will

not be perpetuated and used as an argument to not take action in the future. In the meantime, transitional methods could be suggested and/or simple information provided (e.g. on abrasion and microplastics).” **[The European Environmental Bureau]**

We need to promote these tyres more and more by means of campaigning under municipalities that could start with including this in their public procurement procedures, see also www.better-tyres-now.eu ***[DCMR EPA/EUROCITIES]***

“A tyre labelling should be designed in a way allowing consumers to make a careful decision, giving incentives to tyre manufactures to improve their products and raising public awareness. In general, the information concerning safety, energy efficiency and environmental protection provided to end costumer must be more reliable. The Tyre Labelling Regulation has implemented a “self-declaration system”. Tyre manufacturers assess the performance criteria of their own products according to defined rules of testing and inform consumers about their own results. In contrary to the type approval system for tyres, using the same test procedures, there is no certification by a third party (independent verification). No evidence on competence for testing is required, e.g. accreditation as test laboratory or designation as a Technical Service. A label based on the neutrality and competence of a third party organization would make a positive contribution to the confidence of market participants and provide the consumer with a valuable means of orientation, enabling them to compare products realistically. Therefore a system of mandatory confirmation tests such as Conformity of Production (CoP), performed by third-party laboratories, should be implemented.
Concerning the implementation of new procedures for the assessment of tyres we refer to the new European regulations on emissions and fuel consumption. According to these regulations “certified values” like the tyre rolling resistance coefficient are implemented to provide a more realistic label on emissions and fuel consumption of new vehicles. The tyre manufacturer may test in a laboratory of the Technical Services (TS), as defined in Article 41 of Directive 2007/46/EC, where the TS performs the testing in its own facility as referred to in paragraph 3.1. Or the tyre manufacturer may test in its own facilities under the condition that:

a. A representative of a Technical Service designated by an approval authority is present, or

b. The tyre manufacturer is appointed as a Technical Service of Category A in accordance with Directive 2007/46/EC Art. 41” **[Verband der TÜV e.V.]**

” For the parameters where it is indicated that measurement methods do not exist, or are not accepted/reliable, further investigation may be required. If these parameters are not included in the current regulation, the Commission should now, at the very least, request that robust and representative methods are developed for these parameters. Considering that the standardization community might not be interested in developing those without a request (or may even not have an interest in “widely accepting” methods that are available), such a Commission request would at least attempt to avoid facing exactly the same situation when a future review or revision takes place. Additionally, consumer understanding of the label should remain a priority, and hence, we invite the Commission to have a consumer understanding assessment, as for other Energy Labels under discussion.” **[ZERO - Associação Sistema Terrestre Sustentável]**

Continental welcomes the introduction of the EU Tyre Labelling Scheme as a powerful tool promoting tire design innovation that balances environmental and safety criteria

and encouraging respective consumer choices. Prerequisite for a positive effect of tire labels is broad awareness and that they are well enforced, so customers consider them and can be sure that the actual tire performance meets the declared grading, when they buy a tire. Ensuring consumer awareness and understanding as well as enforcement should be the overall objectives when considering potential amendments of the Labelling Scheme.

Q 14+15: Third party verification and market surveillance

Continental is convinced that market surveillance of label performance through regular spot check testing (not simply verification of documents) with meaningful penalties in case of proven non-compliance provide the most effective and efficient tool to ensure reliable labelling and a level playing field. The self-certification requirements reflect the available testing infrastructure. If only third party testing was allowed, this would create unacceptable delays and costs for the tyre industry, with disadvantages also to consumers.

Continental welcomes and encourages more visible enforcement actions and an EU wide coordination of activities, e.g. the exchange of information on candidates tested among EU Member State Authorities.

Q 16: Snow and Ice Performance

Having the option to indicate on the EU Tyre Label that the respective tyre is suitable for winter conditions, would be a valuable consumer information. This should be done by adding a respective "marking", which is based on a legally defined test (e.g. the Three-Peak-Mountain-Snowflake Symbol) to the Label. Continental does not support adding complexity to the Label through the addition snow or ice performance "grading" to the label.

Q 17: Re-treaded bus, truck/ lorry tyres

Prerequisite of including re-treaded C3 tyres in the EU Tyre Labelling Scheme is that it improves comparability of the performances of re-treaded and new tyres. The requirements for Label class setting of retreaded tires need to be set accordingly.

Q 19: Abrasion and Microplastics

The contribution of tire road wear particles to microplastics in different environmental compartments is an important and complex question which the tire industry investigates with urgency. At present, many uncertainties prevail, while it is acknowledged that abrasion largely depends on external factors such as road surface and topology, driving behaviour etc. Appropriate mitigation measures need to be defined once a more robust scientific understanding has been built. ***[Continental Reifen Deutschland GmbH]***

For the parameters where it is indicated that measurement methods do not exist, or are not accepted/reliable, further investigation may be required. If these parameters are not included in the current regulation, the Commission should now, at the very least, request that robust and representative methods are developed for these parameters. Considering that the standardization community might not be interested in developing those without a request (or may even not have an interest in "widely accepting" methods that are available), such a Commission request would at least attempt to avoid facing exactly the same situation when a future review or revision takes place. Additionally, consumer understanding of the label should remain a priority, and hence, we invite the Commission to have a consumer understanding assessment, as for other Energy Labels under discussion. ***[Quercus ANCN]***

"The preparatory study to this consultation shows that awareness of the label has increased from 30% in 2012 to 53% in 2015 (p.27). This is significant, given that the Regulation has only applied since 2012. It is thus difficult to argue that there is an

awareness deficit; a few basic steps such as informing customers even when they are not given a choice of tyres appear as simple, logical and efficient steps to further improve awareness.

Furthermore, TV and radio advertisements (by and large 30-second spots) are not optimal platforms for conveying technical information in a meaningful way to consumers. The study recognises that including labels in advertisements would present a number of obstacles as "tyres of the same model with different dimensions often have different label values" (p.76). Conversely, the potential negative impact that mandatory information messages would have on TV and radio revenues could be significant (less time available for advertising and less attractiveness for advertisers).

Hence, not only do mandatory mentions of the label in advertisements seem inefficient in terms of raising awareness, they could also have critical unintended consequences on the broadcasting industry. Technical promotional material should therefore remain the natural vehicle for information on tyre labels. We remain available to provide additional information on this matter." **[European association of television and radio sales houses]**

I. Request for modification of Article 1, (2), 3, of Regulation (EU) No 1235/2011 of 29. Nov 2011, amending Regulation (EC) No 1222/2009 by:
1. Cancelling the Subtrahend – 0,03 in Formula G = G(T) - 0.03, Calculation of wet grip index (G), where G(T) = wet grip index of the candidate tyre as measured in one test cycle.
2. Cancelling Wet Grip Classes E and F for C1, C2 and C3 tyres in current Tyre Label table.
Reason:
Formula G = G(T) – 0.03 in (EU) No 1235/2011 causes wet grip class F for C3 tyres to violate, and classes E for C3, and F for C1 and C2 tyres being only 0.02 G above Type-Release with Regulation No 117 (UNECE) [2016/1350].
Required Minimum Type Release Wet Grip Index for Normal Tyres:
6.2.1 Class C1, with (G) ≥ 1,1
6.2.2, Class C2, with (G) ≥ 0,95
6.2.3, Class C3, with (G) ≥ 0,80.
Comparison of Wet Grip Class F, normal C1 Tyres,:
UNECE Type Release, Wet Grip Index G, with G ≥ 1,1 (larger or equal),
and corresponding
EU Tyre Label, Wet Grip Index G with G ≤ 1,09 (smaller or equal).
II. Request for permanent marking of the Tyre Label classification C1, C2 and C3 by each Tyre Manufacturer on their new tyres for identification. Loose paper identification is uncontrollable. **[European Association for Accident Research and Analysis (EVU), Graz, Austria]**

"Current marking applies only to new tires. Today there are no test methods and information about how tire properties change in wear and tear. It would be desirable to investigate the possibility of also obtaining information in the tire label regarding performance throughout the lifetime." **[Däckbranschen Sverige AB] [Machine Translated]**

"In principle, the ZAW supports the objective of Regulation (EC) No. 1222/2009 (hereinafter referred to as the "Regulation") to provide consumers with environmentally relevant information on tires that enable them to make informed purchasing decisions.

As correctly stated in the VO (EG 17), the time and place of the purchase decision must be taken into account. Therefore, it must be ensured that all environmentally relevant information, including any graphic prescriptions (labels), is made available to the consumer only where he / she takes note of the information in a manner relevant to the purchase decision. This does not usually take place via the media advertising, but in the course of the further information process significantly via other sources, especially brochures, test reports, information on seller or manufacturer websites and at the point of sale.

The ZAW therefore rejects compulsory information in media advertising as a means of informing and informing the purchaser of disproportionate and not expedient. Forced information in advertising significantly curtails the legitimate communication interests of the advertising economy and the need for advertising financing essential to free and independent media. Mandatory information inevitably leads to the reduction of freely designable content and thus to censorship. At the same time, this endangers the financing of the media and thus also those editorial contents that are indispensable for public opinion formation and private behavioural change on environmental and climate issues.

These correlations have been taken into account by the current regulation with its differentiated regulations on compulsory information in an appropriate manner. These are then provided at the point of sale and in technical promotional material. On the other hand, media advertising is rightfully explicitly excluded from the information obligations provided for in the regulation (see EC 18). From the point of view of the German advertising industry, this is the right way to ensure an informed purchasing decision by the consumer without jeopardizing the refinancing of the media and thus the information of the consumers through the media

This balanced information system must therefore be retained and in the future transferred to other energy labelling regimes (notably the EU Car Labelling Directive 1999/94 / EC).

In any case, in the context of a possible revision of the Regulation, the obligation to disclose environmentally relevant characteristics may be extended to media advertising. An extension to media advertising would curtail the legitimate communication interests of the advertising industry and damage the existence of advertising financing necessary for free and independent media without an informational added value for the consumers." **[Zentralverband der deutschen Werbewirtschaft] [Machine translated]**

"As Solvay, a key player in silica for the tire industry, we want to emphasize 3 points:

1) To ensure people safety (wet grip) in winter conditions, we recommend to create a Snow and Ice label

2) To raise people awareness on tire labelling and performance, we suggest to improve the transparency of the tire park evolution by creating and publishing a yearly outlook of the number of tires sold with their label characteristics: Rolling Resistance at A, B or C ...level, Wet Grip at A, B or C....level, etc....

3) It is important to monitor how the overall tire performances (Rolling Resistance, Wet Grip, Noise) age during the tire lifecycle (e.g.: performance variation after 10 000 Km, 20 000 Km, above 30 000 Km)" **[Solvay]**

ANWB: Revision standardised measurement methodology required, because now not always covering reality e.g.
- Wet grip in range +5 - +30 degr. C, range too big;
- Rolling resistance measured with straight wheel camber, this is not the reality;
- Only one single reference tyre;
- May be tested with specially prepared test vehicles
TCS: The mobility Club tyre tests show that manufacturers' EU label declarations often significantly deviate from the real measured values. It should be noted that not only better, but also lesser tires compared to the labelled ones are commercially available.
Reasons can be:
- The label is a self-certification of the manufacturer and can follow a targeted marketing strategy;
- Control possibilities of the label values by the authority are questionable;
- The classification of summer, winter, and all-season tires is determined during measurements applying temperature windows;
- A uniqueness of the label values are not always given:
o Cautious vs. Optimistic interpretation of the measured values;
o The boundary conditions are too broadly defined (road test surface, temperatures, test vehicle ...);
o All tire dimensions are compared with a reference tire (SRTT) dimension 225/60 R16 in the test criterion wet grip. With this classification, no difference is made between different tire dimensions.
o This means that (even with the same product quality) narrower tires can systematically fall into worse wet grip classes than wider ones;
o The label says nothing about the absolute, achievable braking distances;
o It may happen that narrower narrow tires have a shorter braking distance than better rated wide tires (when measuring on the respective tires for the tire).
"That's why the EU tire label is today only use-able for the consumer within very narrow limits as purchasing orientation."
Upon request from the EC the TCS test report (in German) can be made available in which TCS has compared their own proprietary tyre test results with the EU label values for the Swiss authorities **[Fédération Internationale de l'Automobile (FIA Region I)]**

"Under-inflated tyres can increase rolling resistance, which in turn can increase fuel consumption by up to 4% and increase CO2 and other emissions. Under-inflated tyres can also reduce tyre lifespan by up to 45%, and is the leading cause of tyre failure. Consumers are reliant on the tyre pressure monitoring system (TPMS) present within modern vehicles, instead of regularly checking and maintaining tyre pressure which would require frequent, inconvenient, intervention from the consumer. While the TPMS provides an effective indication of significant pressure loss e.g. in the case of a puncture or blowout, it does not provide an effective system for optimizing air pressure on a day-to-day basis including the gradual tyre pressure loss which occurs over time under real in-use conditions.

Tackling the issue of under-inflation at source (by maintaining optimal pressure for longer, via improved air retention of the tyre itself) would reduce the need for consumer monitoring and intervention. As tyre regulations and standards continue to progress, the goal should be to drive consistent and reliable performance and efficiency improvements over the lifetime of the tyre under real use conditions. A key aspect is inflation pressure loss rate (IPLR) performance. Specifying tyres with a maximum IPLR of e.g. 2% or 2.5% (which could also be progressively reduced in response to market demands and

technology developments) should promote improved IPLR performance of tyres in the EU.

A simple and cost effective solution is already available with conventional materials, equipment and tyre building technology. Material composition of the tyre inner liner is key to IPLR performance, with increasing halo-butyl content being the most important factor. Gauge also has an effect but is only a secondary contributor. Other components such as oils, fillers and recycled scrap can also have a negative impact. It is also advisable to review the current rolling resistance test procedure (currently performed at optimum pressure) to fully assess actual in-use performance.

Under-inflation will be even more important as electrical and autonomous vehicles enter the market place. As internal combustion engines are less efficient than electric vehicles from an energy conversion standpoint, losses from rolling resistance have hitherto had less of an impact. However, hybrids and electric vehicle powertrains are more efficient and therefore tyre rolling resistance has a greater overall impact on energy use.

ExxonMobil recommends the Commission gives due consideration to:

• Tyre air retention criterion / specification within a targeted amended, or fully revised, EU Tyre Labelling Regulation

• A revised rolling resistance coefficient (RRC) standard test and rating that requires RRC average over time vs. a single data point under optimal conditions

• Providing e.g. CO2 credits for OEMs to increase the adoption of tyre technologies that can help improve in-use tyre performance" **[ExxonMobil Petroleum & Chemical BVBA]**

"Sweden's recommendation on consumer information regarding tyre performance during winter conditions

The energy label for tyres should include consumer information on tyre performance during winter conditions. Such information is necessary to help the consumer choose the right type of winter tyre. Today the energy label for unstudded tyres includes information on tyre performance on wet surfaces, but does not include information about tyre performance on snowy or icy surfaces. Therefore, when Swedish consumers receive information that Central European unstudded tyres perform better than Nordic unstudded tyres in wet conditions, but receives no equivalent information on the performance of such tyres on snow or ice, such consumers may be inclined to believe that the tyres even perform better in typical Nordic winter conditions. In other words, without complementary information about tyre performance under snowy and icy conditions, such consumers could choose the wrong type of winter tyre. This is particularly true when consumers buy tyres on the internet without the possibility of speaking with a representative who can answer questions about the product.

Furthermore, consumer information should clarify that tyres that are not within the scope of the regulation, such as studded tyres, may not bear an energy label. During market surveillance, the Swedish Energy Agency observed that many studded tyres are nonetheless labelled, which could confuse the consumer." **[Swedish Energy/Chemical/Transport Agencies]**

One of our main concerns it to improve knowledge about, quality and marking of winter tyres and to ensure that these tyres are used. The UNECE R117 Annex 7 Alpine symbol fulfils the requirement for winter tyres. ***[Nordic Logistics Association]***

"The Advertising Association supports the Regulation's objective of providing consumers with the relevant environmental information that enables them to make informed purchasing decisions.

The Regulation acknowledges that relevant information should be provided to consumers at the appropriate point during the purchase process, i.e. the time and place of the purchasing decision. Advertising is generally only the starting point of the purchase process, meaning that it is more appropriate for relevant environmental information to be provided via technical promotional material and at the point of sale. Indeed, media advertising is explicitly excluded from the information obligations set out in the Regulation (Recitals 17 and 18).

We therefore reject any extension of compulsory information requirements in media advertising as a disproportionate and inefficient measure. An independent and pluralistic media ecosystem depends on advertising. Any extension of information requirements for advertising would put the financing of the media at risk. There is only a limited amount of information that can practically be included in advertisements, and extending the requirements would result in advertisers choosing alternative ways to promote their products rather than through placing advertisements in the media.

We support the rules set out in the current Regulation as the most appropriate way to ensure a consumer makes an informed purchasing decision, without jeopardising the financing of the wider media ecosystem. This balanced system must be retained in this Regulation, and in the future should be reflected in other energy labelling regulations (notably the EU Car Labelling Directive 1999/94/EC)." **[Advertising Association]**

"In principle, the AIG supports the objective of Regulation (EC) No. 1222/2009 (hereinafter referred to as the "Regulation") to provide consumers with the relevant environmental information on tyres that enables them to make informed purchasing decisions.

As stated in the Regulation (recital 17), the time and place of a purchase decision must be taken into account. Relevant environmental information, including any graphic information (labels), is therefore made available to the consumer only at the appropriate point during the purchase decision process. This is usually provided through brochures, test reports, information on seller or manufacturer websites, and at the point of sale, rather than through media advertising.

AIG therefore rejects the notion of extending compulsory information requirements in media advertising (Question 12.3) as disproportionate and inexpedient. Mandatory information requirements in advertising significantly curtail the legitimate communication interests of the advertising economy through reducing advertisers' ability to design content freely. Ultimately, this impacts the advertising revenue which is essential to supporting the free and independent media content that plays a vital role in public opinion-forming and behavioural change on environmental and climate issues.

This has been taken into account in the current Regulation, which includes differentiated requirements on the provision of mandatory information via appropriate means, i.e. this information must be provided at the point of sale and in technical promotional material

but not in media advertising. Indeed, media advertising is explicitly excluded from the information obligations set out in the Regulation (recital 18).

The AIG believes this is the right way to ensure a consumer makes an informed purchasing decision without jeopardising the refinancing of the media ecosystem. This balanced system must be retained in this Regulation, and in the future transferred to other energy labelling regulations (notably the EU Car Labelling Directive 1999/94 / EC).

Under no circumstances should the requirement to disclose relevant environmental properties in media advertising be extended in the course of any revision of the Regulation. The Regulation's objective of enabling consumers to make an informed purchase decision can and has been achieved through the current information requirements. Extending these requirements to media advertising would curtail the legitimate communication interests of the advertising industry and severely damage the financing of the media, without providing added value for consumers." **[Advertising Information Group]**

"Incentives should be created to develop tires with less microplastic abrasion. With regard to microplastic abrasion, grading / differentiation in labelling would be important in order to provide the consumer with information for a purchase decision." **[BDEW Bundesverband der Energie- und Wasserwirtschaft*] [Machine translated]***

"1.The regulation should integrate a clear obligation to manufacturer (supplier) to fulfil compliance evaluation procedure, including periodical control of production (to ensure the declared values are still valid). Regulation does oblige the manufacturer to provide technical documentation on request (art.4), but it is not sufficient. In practice the documentation is often just compiled on request, sometimes it is just an mail, explaining how the declared values are defined. Such an approach (although compliant with an obligation "to provide" a technical documentation) does not contribute to reliability of tyre labelling.

2. The text of regulation may be improved for more clarity. Market surveillance authorities and even laboratories have sometimes difficulties to interpret the text in the same way (experience from the recent cross-border market surveillance campagne). Examples of points to ameliorate: content of technical documentation (should be more precise), verification procedure (not clear which values should be taken, corrected or not), alignment procedure (more accessible language is necessary, results of alignment readily available). Also the meaning "laboratory" should be clarified. Which laboratories are allowed to perform activities under regulation?" **[Federal Ministry of Environment]**

"EMMA and ENPA are happy to submit a short contribution as many European publications today include advertising from tyre manufacturers. We would in particular like to comment on the suggestion to extend technical information on tyre efficiency to advertising, specifically in magazines and newspapers. It is our view that a mandatory inclusion of such information would be inefficient and would in the process have negative effects on the value of advertising in both print media and digital media. Including technical information in advertising spots is ineffective for several reasons: there is very limited space to allow the inclusion of detailed information in an ad displayed in a publication, therefore a prominent space-consuming label would render the ad valueless for advertisers. Essentially, the purpose of advertising is to inform the

consumer of the existence of the product. The moment when consumers decide to buy a product happens at a later stage in the purchase decision process, for instance in the sales room or in the online shop. Therefore it would make sense to include detailed technical information at that time in the process. In that connection the current directive imposes stringent information obligations. Nevertheless, the Review study on the Regulation (EC) No 1222/2009 on the labelling of tyres pointed to several weaknesses in terms of enforcement of the information obligation in chapter 7 and 8 (lack of clarity on the responsibility of dealers in terms of information obligations, difficulties for market surveillance authorities (MSAs) to inspect how information is provided, information not displayed in the shop itself as many of the tyres are in the stock rooms, consumers not aware of the labels etc.). Finally, if mandatory information in advertising is introduced, companies producing inefficient tyres will simply abstain from using traditional advertising methods in the press and will revert to other marketing techniques to the detriment of publishers.
For all these reasons we would argue that core progress can only come from either greater consumer responsibility which can be encouraged through more awareness-raising on environmental issues (in that regard the press sector contributes to inform and educate citizens through its editorial content) and/or better enforcement of information obligations at the point of sales." **[EMMA & ENPA]**

"Labelling the tires can be of great benefit to consumers. In order for this benefit to actually exist, the manufacturer's information must, however, be checked by the state, so that the labels do not endorse and often spoil the advertising of tire manufacturers! The last ADAC winter tire test showed numerous differences between tire markings and actually determined test results!" **[Consumer] [Machine translated]**

As tyres are characterised by a number of parameters which are interrelated, improving one parameter may have an adverse impact on others. Those issues are essential, especially when it comes to road safety and to the customer's welfare. In that sense, AER supports the principle of helping consumers to make informed choices when purchasing tyres or a product containing tyres.

In the current Tyres Labelling Regulation No 1222/2009, obligations are imposed on the vehicles suppliers and vehicle distributors in article 6. The latter are, inter alia, responsible for providing end-users with information for each of the tyres offered. In addition, it is stressed that this information shall be at least included in the technical promotional material. An exception is however made in Recital 18 which outlines that this obligation does not include advertisement in radio broadcasting formats.

AER supports the current phrasing and calls for the European Commission to maintain it. Indeed, AER believes that, especially when it comes to radio, advertising is not the right place to insert detailed information. It does not and cannot provide all information necessary for the final purchase decision. The consumers' decision is based on many other sources, such as brochures and websites, and information collected at the point of sale. Information is therefore much more useful to the consumer in dedicated information materiel, at the point of sale or online, when the decision to purchase is being performed.

AER questions the effectiveness of mandatory information in media in general, and especially on the radio. In the spirit of Better Regulation, AER would like to stress that the arguments set forward in this submission can be transposed to any piece of regulation dealing with advertising, especially with regard to radio: advertising is not

the right place to insert detailed information. This argument is particularly relevant, considering the recently adopted Energy Labelling Regulation, where radio was singled-out and recognised as different from any other medium when it comes to terms and conditions / warning messages inserted in advertising.
AER can only answer in an efficient manner the question set forth by the public consultation with regard to advertising (question 12).
Question 12. Raising awareness. The study found that some consumers and organisations were not aware of tyre labelling or the benefits of investing in fuel efficient tyres. Which of the following options (if any) would you like to see included in the Regulation in order to raise awareness?
Whilst AER believes it is key to help consumers in making informed choices when purchasing tyres or a product containing tyres, it rejects the idea of extending the label's display to advertising. Indeed, findings show that consumers, when searching for detailed information before making a purchase decision, do not seek such information in advertising. Information is perceived to be much more useful at a later stage than when advertising: through websites, in information brochures or at the point of sale – Information is more useful when the decision is taken to perform the purchase.

Besides, radio is a non-visual medium: warning requirements / terms and conditions (or labels) in advertising are particularly burdensome – when detailed messages are to be communicated in an advertisement, these are to be broadcasted in an added time-space to the latter. This increases the amount of time, hence the price, of the considered commercial message. In addition, needless to say, it lessens the commercial impact of the advertisement (a usual ad lasts for 15-40 seconds). These combined effects impact broadcast media, and radio in particular, and constitute factors that can deter advertisers away from using radio.

However, commercially funded radio can only broadcast programmes free of charge to millions of European citizens thanks to the revenues it collects by means of advertising – The only viable business model for radio nowadays and for a foreseeable future is broadcasting of free-to-air programmes. Advertising is the prerequisite to produce useful and attractive content, and to ensure radio is the most intimate medium. Radio listeners can thereby access for free to entertaining and informative content. In that sense, radio plays a fundamental role in today's society: it is entrusted with many public interest obligations, and it is an essential actor of cultural diversity, media pluralism, access to creativity, social inclusion and disaster relief.

Inserting compulsory information / labels / terms and conditions in advertising, and especially radio advertising, does not only hinder commercially funded radios' ability to produce content, it is also bound to miss its aim – informing the consumer. Consequently, AER calls for the status quo regarding advertising rules contained in the Tyre Labelling Regulation: i.e. no labels or terms and conditions inserted in tyre advertisements in billboards, newspapers, magazines, radio broadcasting, television and similar online formats.

Radios consist of a myriad of small and medium sized enterprises. Moreover, on-air broadcasting radios reach massive audience on a daily basis in all EU Member States: 80% of the EU population on average listens to radio for at least 2 or 3 hours per day, as shown by national audience measurement. Commercially-funded radios indeed constitute a unique network of small and medium-sized enterprises (SMEs), contributing to cultural

diversity, media pluralism, access to creativity, social inclusion. They also offer free-to-air services of general interest:
- they evolve in highly competitive environments
- their programmes encompass, broadly speaking, all possible formats, from debates to music-only- As for the music broadcast, within one market, as soon as there is demand expressed, it has to be fulfilled; so, most of the musical expressions are represented
- most of them are non-politically affiliated, and certainly keep the freedom to express their opinion or to participate to the public expression of the opinions of their listeners
- their audiences are local, regional, or national
- they strive to develop on all possible platforms
- during natural, major or minor disasters, radio is one of the first tool to inform the Public. Radio is the most intimate medium, and has been so for the past 50 years at least: it is indeed ubiquitous, mobile, simple-to-use and free-to-air. All these features enable our audience to cultivate a personal relationship with our programmes, our DJs, our hosts, and our brands. Our listeners thereby access programming they enjoy, and useful information. [**The Association of European Radios]**

"ETRMA would like to elaborate on the following specific questions from the Questionnaire:

ETRMA firmly believes that Tyre Labelling has encouraged tyre manufacturers to upgrade their products in a context of increased competition on the European market, and has offered the possibility for producers to benefit from product differentiation, based also on product performance quality.

The measure has the potential to increase informed choices in tyres by empowering consumers and fleet owners to focus more on a set of important, standardised performances when purchasing a tyre.

However, as it was demonstrated in the Viegand Study, "it is considered premature to revise the labelling scale requirements for both wet grip and fuel efficiency, and even noise, while efforts should be dedicated to increase awareness and market surveillance efforts,,; ETRMA supports this analysis.

Moreover, the EU tyre industry has taken a proactive approach in reducing CO2 emissions through advanced technologies, while promoting road safety and other key performances at the same time. Because tyres are technologically complex products, tyre development faces a multiple set of customer-oriented performance requirements which often conflict with each other. It is worth mentioning that the performances rated on the tyre label are the results of complex engineering developments that consider background antagonistic factors.

Finally, ETRMA stresses the need for a holistic market study that looks at the current tyre distribution – in terms both of units and volume – at least in the top three classes for both rolling resistance and wet grip.

Specific comments:

Adaptation to technical progress – necessary revision to wet grip test method C1:

The experience accumulated so far by the Industry and by the MSAs on wet grip test method for passenger car tyres, indicates an opportunity and the need for further improving the accuracy of the method.

The tyre industry has engaged serious activities (1) to improve the reproducibility of the current C1 wet grip test method, keeping on average similar wet grip indexes values and ratings as current test procedure (to avoid gaps with the current regulatory framework); and (2) drive the global standardization (ISO) towards this improvement of reproducibility, while promoting harmonization in the different countries (especially EU / US / Japan).

ETRMA is recommending introducing the new revised test method at the current planned revision of the tyre label scheme.

(Q11): Information in Vehicle documentation:
We would like to stress the fact that information provided in the vehicle documentation need to be more accurate. Today - despite the fact that the text of the regulation is clear – the customer has no chance to make any choice. The accuracy of the information is important when the consumer buys a new vehicle and when he will replace his tyres (at least with the same grades or better). See an example below of what one vehicle manufacturer provides in the brochure when you have the option to select alternative sizes (=tyres):

(Q12): Raising Awareness
Member States should be encouraged to ensure that their Central Governments as well as local authorities are aware of the requirement to purchase tyres in the both highest fuel efficiency and safety class and to include these aspects in their tenders for service contracts in accordance with the requirements in tyre label regulation as well as in Annex III of the Energy Efficiency Directive1.
These measures are clearly requested under the Clean Vehicle Directive!
(Q13): Pre-sale provision of information
Dealers and Points of Sale must show the label to the customer for each tyre under consideration.

(Q14): Third party testing
Industry does not support introducing independent third party testing of the tyre performance:
- the testing requirements are clearly defined in the regulatory texts;
- the national authorities have familiarized with the testing requirements since the introduction of the label scheme;
- should regular market surveillance activities with meaningful penalties in case of found non-compliance be deployed, ETRMA is of the opinion that there is no need for introducing third party testing. In fact, this might be disproportionate to the available infrastructure of testing institutes/type approval authorities labs, while not proven as a need from effectiveness and efficiency perspectives. If only third party was allowed, this would create unacceptable delays and costs for the tyre industry, with disadvantaged also to consumer.
- the European tyre industry does not see any benefit and does not recommend to replace the current self-certification requirements .

The tyre industry acknowledges the need for, on the one hand, increased awareness and use of the tyre label by users and professional operators, and on the other hand continuous and effective market surveillance. In other words, there is still a large potential for the full establishment of the current label scheme on the EU market and its delivering on the original policy objectives of the tyre labelling regulation.

(Q15): Market Surveillance
Increased, more coordinated, more visible enforcement actions through market surveillance is needed. To do so, national authorities need a sound infrastructure, good organisation, appropriate legal powers, suitable facilities and skilled officers, benefiting from high quality training. Meaningful penalties must be established by Member States in case of non-compliance.
(Q19): Abrasion
The Report from the Commission to EP/Council (COM 2017-658/final) states that abrasion depends largely on external factors (i.e. tyre pressure, road surface, load, driving styles, etc.). While the European Tyre industry fully contributes to research on TRWP, ETRMA believes that the labelling scheme is by no means appropriate to address this complex question.
Furthermore, there is currently no harmonised and standardized test method. Industry has launched an ambitious programme that will require efforts and resources in the coming years, to assess the feasibility of establishing a standardized test method measuring tyre tread abrasion rate.
(Q21): Adding a requirement for suppliers and distributors to upload tyre information to a digital registration database:
*ETRMA supports all initiatives that will positively influence/facilitate the consumer purchasing behaviour, while also strengthening market surveillance in a cost-effective way. The change in consumer behaviour will encourage increased innovation and research for high performing tyres, including the parameters for fuel efficiency and safety. However, it is essential that such a tool is thoroughly defined and assessed in terms of objectives, final users, workload, process, accessibility and data security, management costs, etc.***[ETRMA]**

From inception IA Feedback:

We welcome the long-awaited evaluation1 of Regulation (EC) No 1222/2009. In order to ensure the desired prescription success, the EU regulation, which is directly applicable in all member states, urgently needs to be supplemented and substantiated in some respects.

We therefore demand in particular:

- *Inclusion of further labelling requirements for advertising material*
- *Specification of the information requirements at the point of sale*
- *Specification of concrete and ambitious tasks for the market surveillance authorities*
- *Introduction of reporting obligations to the EU Commission*
- *Commitment to fraud-proof and realistic testing procedures*

Based on our own market surveillance activity, regulatory compliant tire labelling is sluggish. Market surveillance takes place only marginally. There are hardly any incentives for consumer information. At the same time, the field of application of the labelling obligations has been kept very tight so far and is significantly behind the comparable labelling regulations. We also note that the market share of fuel-efficient tires is increasing only hesitantly.

There is no doubt about the raison d'être of the regulation. Legislative requirements at EU level are necessary to achieve important Community objectives. 20% to 30% of the

fuel consumption of vehicles is attributable to the tires. As the EU Commission points out in recital 4 of the Regulation, the regulation can reduce tire rolling resistance significantly in terms of energy efficiency in road transport and thus reduce pollutant emissions. Information measures are included in the EU's energy efficiency and climate change policies. Information about external rolling noise enables the inclusion of harmful traffic noise in the purchase decision. Information on wet grip is used for road safety.

According to recital 2, the regulation aims to reduce total energy consumption by 20% by 2020. This common objective of significant energy savings in the area of tires through informational measures by economic operators towards consumers is thus far missed. Nor does the Regulation, as it stands, take into account the need for effective monitoring of obligations on manufacturers, suppliers and distributors.

Specifically, we therefore consider the following remedial measures necessary:

 Incorporate additional labelling requirements for promotional material to improve informed consumer choices.

A clear tire marking must be used for all advertising measures. Any tire purchased or directly offered for sale is well-perceived by the end user, clearly visible, legible, uniquely identifiable to the tire and accessible to the end user. This applies to both print advertising and advertising in electronic media. The labelling requirements for tires should be based on those for passenger cars in accordance with Directive 1999/94 / EC and Recommendation 2003/217 / EC. On websites, the marking must take place immediately at the moment when concrete tire characteristics such as advantages, price or technical features are advertised, in order to prevent the labelling from being hidden on bottom and following pages. If possible - for example when advertising on the Internet - the label should be displayed at the same time.

Complete illustration of the tire label in distance selling using remote communication means.

If consumers can purchase tires directly without first seeing them, complete information must be guaranteed. This requires, in particular, an image of the label due to its recognition value and graphic underlines to enable comparisons. Therefore, the label must be displayed clearly visible in the immediate context of the sale offer the label. The labelling requirements for advertising must also be met in the case of direct purchase opportunity.

Specification of the information requirements at the point of sale

There is a need to anchor expanded information requirements at the point of sale and exhibition to ensure informed purchasing decisions.

The marking at the point of sale and exhibition must be clearly visible, legible, clearly identifiable to the tire and accessible to the end user.

Inclusion of mandatory labelling of tires on new vehicles

Vehicle manufacturers, suppliers and / or dealers must also be held accountable in order to fully exploit savings potential at an early stage and to set incentives for energy-related improvements.

 ***Defining concrete and* ambitious tasks for market surveillance authorities to increase the efficiency of market surveillance**

Authorities must be required to carry out periodic random checks on the fulfilment of legal requirements for tire marking and others. by the obligated parties in a statistically significant number. By means of supplementary laboratory tests, the content accuracy of the label must also be checked. Violations must be punished with appropriate sanctions (in particular by means of dissuasive fines). Market surveillance needs to focus on the effective enforcement of the Regulation and the removal of existing enforcement deficits. Necessarily, enforcement rules must therefore aim at a discretionary exercise aimed at improving environmental and consumer protection ("target" intending a certain behaviour rather than "can").

Introduction of annual reporting obligations to the Commission

The nature and number of their inspections must be reported by market surveillance authorities in annual reports from the EU Commission.

Fraud-proof and realistic test procedures

In view of corresponding negative experiences in the field of car type approval and the energy consumption labelling of energy-related products, we call for a review of the test procedures for fraud-proofing and realistic modelling of consumer driving behaviour. It must be ensured that the test methods for energy efficiency, wet grip and rolling noise reflect the actual consumer behaviour. Any bypasses in tests by special software or hardware or similar must be avoided by taking precautions. The test methods and standards must be able to recognize intentional or unintentional circumvention.

 Introduction of a publicly accessible product database

*Similar to the requirements set out in the new EU Energy Labelling Regulation, obliged parties are required to place the required product information on the tires they have made available on the market into a European product database. The database must be free and fully accessible to public authorities, consumers and consumer protection associations.***[Deutsche Umwelthilfe e.V.] [Machine translated]**

"BIPAVER would like to contribute with its opinion to the Ex-post evaluation of the European Tyre Labelling Scheme in regard to a possible integration of retreaded tyres.
BIPAVER, as the representation of the independent retreading industry in Europe, generally supports the European Labelling Scheme, although retreaded tyres are at the moment not part of it. The international member associations with their national members are in favour of creating a transparent and neutral tool to inform their end user and fleet customers about the ecological, environmental and safety relevant features and properties of tyres, retreaded in particular.
The EC statement that "the cheapest, cleanest, and most secure energy is the energy that is not used at all", extend by the ecological use of resources and the prevention of unnecessary waste absolutely corresponds with the principle of tyre retreading. It is a known fact that reusing a used tyre/casing implicitly contributes importantly to the sustainability. Reuse leads directly to less waste into the environment, as well as an important reduction of raw materials. Approximately 100 litres of crude oil and 69 kg of other materials are required to manufacture an average new truck tyre, a retread only needs 30 litres of crude oil and merely 15-20 kg of materials. Therefore, the carbon footprint diminishes from 220 kg of CO2 emission to only 39 kg, also due to the need of

less energy. In addition a modern quality retread delivers comparable performances to a new tyre at a fraction of its price.

That makes the retreaded tyre per definition an ecological, economical and sustainable product which should be generally supported by the EC and its member states. Taking into consideration that the "base" of a high quality retreaded tyre is a retreadable high quality casing it is also common sense to motivate new tyre manufacturers to build appropriate tyres ensuring a possible second or third life as retread instead of distribution

"cheap one-way" products. Enabling the retreaded commercial tyre to "visually" prove its capabilities by integrating into the EC's labelling schema will promote its market acceptance and competitiveness. Therefore BIPAVER, in cooperation with ETRMA/ETRTO, proactively works to find an adequate system for the integration. With the RETRYE project, an EU co-funded analysis about the impact of retreading parameters to Rolling Resistance, Wet Grip and Noise, BIPAVER and the especially created consortium gained fundamental supporting know-how. Due to the aftermarket share of 35- 40% in Europe retreaded truck and bus tyres have an important contribution in the segment of commercial vehicles providing a huge positive impact and added value to the circular economy. The constraints of an integration are the vast diversity of possible products combinations in a retreading plant/workshop due to the combinations of tyre sizes, casings and tread pattern and the typical SME character of the independent retreading industry. Unlike a type homologated new tyre, million times produced the same way, it is the individuality of each retreaded tyre that makes it so difficult to find an appropriate labelling method. Accurate, reliable and repeatable in relation to the required label performance parameters but affordable and economically feasible for the SME retreader. Not being a threat but certainly a challenge for the complete retreading business, new tyre industry driven or independent, BIPAVER constructively participates in the solution process. Underlining the fact that the retreaded tyres, as an ecological, environment friendly and sustainable product deserves more support and attention than actually given in society and politics.

For further consultation regarding this subject we recommend the EY study about "The socio-economic impact of truck tyre retreading in Europe – The circular economy of tyres in danger", from October 2016. The document is available as download under http://www.etrma.org/library-2 **[BIPAVER]**

Annex 3: Who is affected and how?

1. PRACTICAL IMPLICATIONS OF THE INITIATIVE

The revised Tyre Labelling Regulation will include the following new measures:

For tyre manufacturers:

- to re-adjust the tyre label classes for both fuel efficiency, wet grip and external rolling noise.
- to register all new tyre models placed on the market in a product registration database and at the same time make electronic versions of the label, product information sheet and technical documentation available in the database.
- to test tyres in laboratories approved under the type-approval process in the General Safety Regulation and use the results for establishing of the label performance parameters.
- on a voluntary basis to include icons for snow and ice performance on the label.
- to provide along with the label a product information sheet (as also provided for energy related products covered by the Framework Energy Labelling Regulation).

For suppliers:

- to show the label when tyres are offered for sale online.

For vehicle dealers:

- to provide the label for tyres on new vehicles offered for sale and in case of purchase through leasing contracts or as part of a fleet solution.

Member States:

- to carry out information campaigns in cooperation with European Commission.
- to give higher priority to joint enforcement actions.

The requirements described above will result in substantial benefits for citizens, society, manufacturers and wholesalers/retailers. Citizens will receive benefits in the form of saved fuel (lower fuel costs) and increased safety and health. Society will receive high benefits in terms of substantial reductions of CO_2 emissions and reduced costs related to accidents and noise pollution. In addition, manufacturer and wholesalers/retailers will benefit from increased turnover and employment.

The requirements will also increase administrative burdens for manufacturers, dealers (of tyres and vehicles), Member States and the European Commission. The estimated administrative costs are described in more details below the summary tables.

2. SUMMARY OF COSTS AND BENEFITS

Overview of benefits total for all preferred options. All benefits are direct benefits.

I. Overview of Benefits (total for all provisions) – Preferred Option		
Description	Amount	Comments
Reduction of CO_2 emissions	10 MT per year in 2030	Society receives the benefits
Increased safety (reduction of fatalities)	€737 million per year in 2030	Society receives the benefits, but also citizens
End-user net savings	€2.2 billion in 2030	Citizens (and end-users) receive the benefits in terms of reduced fuel costs
Increased employment	235 673 more jobs in 2030	Manufacturers, wholesalers and retailers will have this benefit
Increased turnover	€ 8.7 billion in 2030	Manufacturers, wholesalers and retailers will have this benefit

Overview of administrative costs (all costs are direct costs) compared to baseline. Numbers are in million EUR. Where no figures are mentioned the extra cost are considered insignificant. In addition "n.a." indicates that it has not been possible to estimate the costs.

II. Overview of costs – Preferred option				
Options	Manufacturers	Dealers	Member States	EU/Commission
Information campaigns			10 (only once)	2 (only once)
Joint enforcement actions			0.02 per year	0.5-1 per year
Mandate to revise testing methods[5]	n.a.			n.a.
Online labelling			3 (only once)	
Labelling of tyres delivered with vehicles at all times[6]		50 per year[7]		
Provision of label for C3 tyres[8]	6 per year[9]			
Inclusion of snow and ice performance				
Re-adjustment of the label	40 (only once)[10]	30 (only once)		

5 Cost for the mandate will be insignificant. But there will be costs on primarily manufacturers, the Commission, and standardisation organisations for development of the standard(s). However, it has not been possible to estimate the costs.
6 Including when vehicles are purchase through leasing contracts
7 Dealers of vehicles, and leasing companies providing purchase through leasing contracts
8 Both for replacement and OEM tyres. Replacement tyres include new tyres provided for fleet solutions.
9 Manufacturers of C3 tyres
10 Per rescaling. If the label is rescaled again after for instance 10 years cost for rescaling will appear again

Tyre registration database	0.25 per year			0.1 (only once) and 0.01 per year
Technical documentation and product fiche content	120 per year[11]			
Amendment of current Annex V on test methods for wet grip of C1 tyres				
Amendment of current Annex IVa on laboratory alignment procedure for the RRC				
Extension of type approval procedure	0.65 per year			
Total	127 per year 40 only once	50 per year 30 only once	0.02 per year 13 (only once)	0.5-1 (per year) 2.1 (only once)

3. ESTIMATION OF ADMINISTRATIVE COSTS

Administrative and compliance costs have been estimated for each of the measures included in the preferred option. Administrative costs are defined as "the cost incurred by enterprises, the voluntary sector, public authorities and citizens in meeting legal obligation to provide information on their action or production, either to public authorities or to private parties[12]".

Information campaigns (EU/national)

It is very difficult to estimate the costs for information campaigns EU-wide. The costs will depend of the type of campaign and the possibilities for cooperation with manufacturers and dealers. In practice the costs will also depend on the available budget in the individual Member States. For this purpose, it is estimated that the average Member State cost for information campaigns will be €0.3 million corresponding to €8.4 million in EU-28 (rounded to 10 million in the table above). Member States' costs could eventually be reduced if the Commission support this action through a funding programme.

Joint enforcement actions

This measure includes activities to foster cooperation as well as exchange of information between MSAs to extend and improve market surveillance and enforcement. The measure will require more involvement from Member States and allocation of additional

11 For provision of product information sheet
12 Commissions impact assessment Guidelines

resources for market surveillances and related activities. The Commission will take an increased role in the market surveillance for tyres by supporting of activities to enhance EU level cooperation. It is estimated that all Member States allocate three working days per year for market surveillance for tyres in addition to the current allocation. This will correspond to around €0.020 million per year in EU-28[13]. In addition the Commission will contribute with around €0.5-1 million per year.

Mandate to revise the testing method

The Commission will draft and submit a standardisation request (mandate) to initiate development of more reliable, accurate, repeatable and reproducible test methods for the tyre performance parameters on the label and development of test methods related to mileage and abrasion.

The administrative costs for drafting and submission of the mandate will primarily be on the Commission. But a wide group of interested stakeholder (including social partners, consumers, SMEs, industry associations and EU Member States) will be involved through a consultation process before the mandate is finalized. Also, the European Standardisation Organisations (ESOs) will be involved as they have the right to refuse a mandate if they do not think the standard can be produced. Even though various stakeholders are involved the working hours per stakeholder is relatively limited and no stakeholders (except the ESOs) are obliged to contribute. The costs for the mandate will appear only once and are considered as insignificant.

However, the development of the standard(s) will require a considerable amount of work in the relevant European standardisation organisations and among various stakeholders involved in European standardisation such as national standardisation bodies, Small Business Standards[14] (SBS), Environmental NGOs (ECOS[15]), consumer interest groups (ANEC[16]), interested manufacturers and Member States.

It is not possible to quantify the costs because the work to be carried out is not yet known in detail. The administrative burden from some of the stakeholders will be limited because their participation in the standardisation work is funded by the European Commission Union and EFTA (SBS, ECOS and ANEC). Traditionally industry plays an important role in the development of standards. However, participation in standardisation work is voluntary and no manufacturer is obliged to bear the costs. Online labelling

This measure is not expected to give rise to significant implementation costs. The costs of producing graphics and other electronic files required to convey the necessary label are already covered when complying with the existing regulation. The proposed requirement to show the label when products are offered for sale online is expected to

[13] Estimated with EU-28 average labour cost of 25.4 EUR/hour. Source http://ec.europa.eu/eurostat/statistics-explained/index.php/Wages_and_labour_costs

[14] SBS is a European non-profit association that represents and defends SMEs interest in the in the standardisation process. SBS is co-financed by the European Commission and EFTA Member States

[15] ECOS receives funding from European Commission, EFTA and several public and private donors

[16] ANEC is a NGO representing consumer interest and is funded by the European Commission and EFTA.

require very little extra work for dealers. Due to the product registration database dealers will have easy access to the necessary electronic files.

For Member State MSAs, the Impact Assessment with regard to labelling of energy-related products on the Internet[17] estimates that there could be transitional costs to add new capabilities or to obtain shared use of services from other agencies charged with on-line market surveillance. These costs will vary by country; they are provisionally estimated at €0.1 million per Member State[18] corresponding to €2.8 million in EU-28 (rounded to 3 million in the table above).

Labelling of tyres delivered with vehicles at all times (new tyres on new vehicles)[19]

Today, vehicle suppliers and dealers are only obliged to inform end-users about the tyre performance parameters of the tyre on a new vehicle for sale in case the end-user can choose between different tyres to be fitted to the new vehicle. By this measure the obligation is extended to cover all new tyres on new vehicles for sale. In addition, leasing companies will be responsible for providing the relevant tyre label information and the label itself to the lessees of new vehicles. Tyres provided with vehicles will primarily be tyres delivered as OEM tyres. There will be no extra costs for the manufacturers of OEM C1 and C2 tyres because they are already obliged to provide the label information and the label for all tyres in the scope of the regulation (there is no exemption for OEM tyres). Suppliers of C3 tyres are only obliged to provide the label information not the label itself. Therefore, the measure will result in some increased costs for the manufacturers of OEM C3 tyres[20].

There will be some additional costs for vehicle dealers and leasing companies because they will be obliged to provide the end-users with the label for the tyres on the vehicle for sale or available for leasing (for new vehicles). The additional time spend for delivering of this information is considered marginal compared to the time spent delivering other information in connection with sale or leasing of vehicles. If vehicle sellers and lessors for each vehicle spend 5 minutes on the provision of the tyre label information and the label the total extra costs will be around €50 million per year[21]. This estimate is based on the number of OEM tyres (C1, C2 and C3) sold per year and the number of tyres per vehicle. It is not possible to divide the costs between vehicle sellers and leasing companies due to lack of data. Often the same company provides both services.

17 Impact assessment accompanying the document Commission Delegated Regulation amending Commission Delegated Regulations No 1059/2010, 1060/2010, 1061/2010, 1062/2010, 626/2011, 392/2012, 874/2012, 665/2013, 811/2013 and 812/2013 with regard to labelling of energy-related products on the internet, SWD(2014) 57 final

18 Impact assessment accompanying the document Commission Delegated Regulation amending Commission Delegated Regulations No 1059/2010, 1060/2010, 1061/2010, 1062/2010, 626/2011, 392/2012, 874/2012, 665/2013, 811/2013 and 812/2013 with regard to labelling of energy-related products on the internet, SWD(2014) 57 final

19 This measure implies that the label should be provided to end-users who buys a new vehicle including purchase through leasing contracts)

20 Extra costs for deliverance of the label for C3 tyres (both for OEM and replacement tyres) are estimated below

21 Number of OEM tyres sold per year are 87 million. With approximate 4 tyres per vehicle the number of OEM tyres corresponds to sale of 21,6 million vehicles. With 5 minutes spend per sale and labour costs of 25.4 EUR/hour the costs per year will be approximately €50 million per year.

Provision of label for C3 tyres

In the TLR, the label information (information about the tyre performance parameters) should be delivered for C3 tyres but not the actual printed label. Implementation of this measure will lead to extra costs for manufacturers of C3 tyres for printing the label but not for establishment of the tyre performance parameters. The costs for printing the label are estimated to be €0.3 per tyre corresponding to around €6 million per year in EU28 (sale of C3 tyres is 18.8 million including OEM tyres). In practice C3 tyres are sold in batches of up to 10 tyres. If only one printed label is printed per batch the costs could be reduced significantly. This estimation covers both sale of replacement tyres and sale of OEM tyres. The replacement sale also includes C3 tyres provided for fleet solutions.

Snow and ice performance on the label

The obligation to show the snow performance (3-PMSF-logo) and/or ice performance on the label is voluntary, so that only tyres designed for winter conditions could bear the logos. The 3-PMSF logo is already used today on the side of the tyre thread for snow tyres that meet the minimum level of performance on snow (braking and traction) determined in the UNECE Regulation 117[22]. The test cost required for use of the 3-PMSF logo varies between € 6.400 – 10.000 depending and the tyre type. But because the logo is already widely used the extra costs for manufacturers are considered being low.

While safety is of a major concern for the consumers the manufacturers providing safe tyres for winter conditions should be able to pass their extra costs for application of the logo on to consumers. There will be no additional costs for the dealers.

Re-adjustment of the label

The current label is no longer accurate because of the GSR banning bottom classes and the fact that for wet grip the current label has an empty class in the middle of the A-G range.

This measure does not involve a full “rescaling” of the label as envisaged under the Energy Labelling Framework Regulation for products where the top class was overpopulated and A+, A++ and A+++ classes had to be added. It would be similar to the situation where a more stringent tier of requirements is introduced after a certain date in current energy labelling regulations. When this happens, suppliers have to print out the new label and fix it to the product. There is no requirement to change the labels on products that are already placed on the market.

The cost for manufacturers to print the new labels will be around €42 million (rounded to €40 million in the table above) for replacement sale of C1 and C2 tyres[23] at a cost of €0.3 to print the label[24].

22 http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:42011X1123(03)
23 Yearly replacement sale for C1 and C2 tyres is 281.5 million tyres.

Tyre registration database

In the Impact Assessment accompanying the framework Energy Labelling Regulation it is estimated that the time required for suppliers to register data in the product registration database will be 2 hours per product taking into account that the manufacturers are already obliged to assemble all the required information and documentation and to make this information available to authorities on request. With around 4.000 new models[25] of C1, C2 and C3 tyres placed on the market per year the estimated costs for registration in the product database will be around € 0.2 million per year. For labour costs an average tariff of EU-28 of 25.4 Euro/hour[26] is used. Training of staff to become acquainted with the system is a one-time investment and not considered significant.

The burden for Member States' MSAs to obtain documents is significantly reduced by this measure. The extra costs for the Commission will be low because it is already obliged to establish and maintain a database for energy related products under the Energy Labelling framework Regulation. It is foreseen that tyres will be included in this database. In the Impact Assessment accompanying the framework energy labelling regulation it is estimated that the cost of establishment of a database for 30 product groups will be €3 million in investment and € 300.000 annual in maintenance costs. It is estimated that the costs for extending the database to tyres will be 1/30 of this amount corresponding to €100.000 for establishment and €10.000 per year for maintaining the database.

Technical documentation and product fiche content

Clarification of the required content of the technical documentation will not cause additional costs because the manufacturers already have to draft technical documentation (but the content is not defined). It is considered that a clear description of the required content will make it easier for the manufacturers to compile the documentation, however the savings will not be significant. In addition, it will probably be easier for Member States to evaluate the received documentation and Member States' costs for market surveillance could be reduced. It is however assumed that they spend the freed-up time on other market surveillance activities instead thereby contributing to higher compliance rates.

According to the current TLR manufacturers are not obliged to provide a product information sheet. If the manufacturers get an obligation for provision of a product information sheet their costs will increase. The costs are assumed to correspond to the cost of printing of an additional label i.e. €0.3 per sheet. It is assumed that the information that should be included in the product information sheet is already available.

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24 Estimated at 0.5 Australian dollar (exchange rate at the time approximately 0.6 €/Australian dollar) by George Wilkenfeld and Associates pty, Regulatory Impact Statement, Energy Labelling and Minimum Energy Performance Standards for Household Electrical Appliances in Australia, February 2009

25 New models in 2017. Based on data from TOL database

26 Labour costs for EU-28 from: http://ec.europa.eu/eurostat/statistics-explained/index.php/Wages_and_labour_costs

It could for instance be the fuel efficiency expressed as the measured value (only the fuel efficiency performance class is on the label). If the manufacturer provides one sheet per tyre sold the extra costs will be €116 million per year (rounded to 120 in the table above). In principle it could be enough to provide a product information sheet per batch of tyre (typically 4 tyres). In this case the additional costs could be reduced to €30 million per year.

There will be no extra costs for dealers or Member States.

Amendment of current Annex V on test methods for wet grip of C1 tyres

For C1 tyres it is proposed to change the wet grip measurement method in the TLR to ISO 23671:2015. The ISO standard to some extent builds upon the ATSM standards applied in the current TLR. In addition, a reference tyre is used to limit the variability in line with the procedure in the current methodology. Against this background assumed that there will be only minor extra testing costs related to the amendment.

However, some initial extra cost could probably be expected for some testing laboratories.

Amendment of Annex IV on laboratory alignment procedure for the measurements of Rolling Resistance Coefficient (RRC)

These measures could require some extra costs for testing laboratories to implement new testing routines and calculation methods. However, the methods have been developed in cooperation with manufacturers and testing laboratories and it is considered that the procedures are already known and could be implemented with only marginal extra costs. There will be no extra costs for Member States, dealers or the Commission.

Mandatory and independent third-party testing (testing in approved laboratories)

It is proposed that tests carried out on approved laboratories according to the type-approval process in the General safety Regulation[27] should also be used for energy labelling of tyres. The extra costs on manufacturers could be low because tyres must already be tested on the approved laboratories according to the type-approval process in the General safety Regulation. However, it is assumed that more tests are required per product family group to establish the tyre performance parameters with the accuracy needed for labelling. It is assumed that the manufactures must carry out additional tests for 20% of new models on the market each year. This will correspond to extra costs for the manufactures of €3.5 million per year[28] (rounded to €4 million in the table above).

For Member States, the use of approved testing laboratories is expected to reduce the need for verification tests. In principle few Member States are currently conducting testing, so there will be few savings, but the need to increase the market surveillance budget in Member States is less.

[27] The approved laboratories are considered to correspond to independent third-party laboratories

28 Numbers of new models per year from TOL database (C1 tyres: 3150, C2 tyres: 287, C3 tyres: 593) and test costs from ETRMA (C1 tyres: 3500-4000 EUR, C2 tyres: 4000-4500 EUR, C3 tyres: 5000-6000 EUR). The highest value for each tyre type is used in the calculation of extra testing costs.

Annex 4: Analytical methods

The quantitative modelling in Excel files for the Impact Assessment was prepared by the external consultant, Viegand Maagøe A/S. The calculations were prepared in several Excel files with data gathered from European databases, the tyre industry, scientific articles and other studies. This Annex describes in detail the data and assumptions the models are based on.

1. GENERAL ASSUMPTIONS

- The development of RRC and WG are based on expected market shares of each label class in the future, which differs in each scenario.
- vehicles with C1 tyres, fleet consists of 41% diesel and 59% petrol (ACEA[29], 2017)
- vehicles with C2 tyres, fleet consists of 88% diesel and 12% petrol (ACEA, 2017)
- vehicles with C3 tyres, fleet consist of 96% diesel and 4% petrol (ACEA, 2017)[30]
- vehicles with C1 tyres are driven 13,500 km per year on average
- vehicles with C2 tyres are driven 21,000 km per year on average
- vehicles with C3 tyres are driven 57,500 km per year on average
- EU HICP (Harmonised Index of Consumer Prices) rates are used to convert all prices to 2017 fixed prices: http://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&language=en&pcode=tec00118&plugin=1
- Vehicle fleet data was obtained from ACEA: http://www.acea.be/statistics/article/Report-Vehicles-in-Use
- Fuel prices were obtained from: https://www.eea.europa.eu/data-and-maps/indicators/fuel-prices-and-taxes/assessment-7
- Road safety and accident data was obtained from: https://ec.europa.eu/transport/road_safety/specialist/statistics_en#
- Road safety costs was obtained from: https://ec.europa.eu/transport/road_safety/specialist/knowledge/measures/monetary_valuation_of_road_safety_en and http://heatco.ier.uni-stuttgart.de/HEATCO_D5.pdf

[29] European automobile manufacturers' Association
30 http://www.acea.be/uploads/statistic_documents/ACEA_Report_Vehicles_in_use-Europe_2017_FINAL2.pdf

2. INFORMATION EFFECT

The methodology to assess effect of label information on purchase behaviour is based on the article "The Impact of Sustainability Information on Consumer Decision Making"[31]. In that article over 40,000 online purchases were assessed, and it was found that certain types of sustainability information had a significant impact on purchase intentions. Direct users—those who intentionally sought out sustainability information—were most strongly influenced by sustainability information, with an average purchase intention rate increase of 1.15 percentage points for each point increase in overall product score, reported on a zero to ten scale. However, sustainability information had, on average, no impact on non-direct users.

- Direct users were assumed to be those finding the label parameter in question "very important" according to the 2016 consumer survey.
    - Find fuel efficiency "very important": 34%
    - Find wet grip "Very important": 62%
    - Find external rolling noise "very important": 21%
- Also, for each scenario it was considered how many already end-users the label in their purchasing decision, and only the additional influenced end-users were assumed to be impacted.

3. STOCK MODEL ASSUMPTION

Sales figures were received from the industry organisation ETRMA[32] back to 2003 and backed up by sales data from the market research organisation GfK[33]. The sales data are seen in the table below.

Table 1: Tyre sales in million units

Sales in millions	2006	2008	2010	2012	2014	2016	2017
C1 replacement	231.46	224.30	249.72	226.42	236.60	248.10	253.31
C1 OEM	59.09	77.61	74.64	71.12	73.80	79.47	80.06
C2 replacement	25.72	24.92	27.75	25.16	26.29	27.57	28.15
C2 OEM	4.96	7.51	4.98	4.98	5.35	6.68	6.72
C3 replacement	12.76	11.42	11.56	9.61	12.19	13.97	14.88
C3 OEM	3.35	4.74	2.72	3.33	3.20	3.65	3.94
Total	**337.33**	**350.50**	**371.36**	**340.62**	**357.44**	**379.44**	**387.06**

Source: ETRMA and GfK

Average tyre lifespans were based on assumptions of the expected tyre life in km and km driven per year for each vehicle type as shown in the table below. The assumptions were primarily based on background data from the Ecodesign Impact Accounting[34].

31 Dara O'Rourke and Abraham Ringer, Journal of Industrial Ecology, 2015 "The Impact of Sustainability Information on Consumer Decision Making", link: http://onlinelibrary.wiley.com/doi/10.1111/jiec.12310/abstract
32 http://www.etrma.org/statistics-2
33 http://www.gfk.com/about-gfk/about-gfk/

Table 2: Assumption on tyre lifespans and mileage

Tyre type	Expected life in km	Average distance driven per year, km	Average tyre lifespan, years
C1	56 700	13 500	4.2
C2	71 400	21 000	3.4
C3	200 000	57 500	3.5

Source: Ecodesign Impact Accounting background calculation model, 2017.

Further assumptions used in the stock model:

Table 3: Further assumptions made in the stock model

C1 share out of C1 + C2 sales	90%
Share of C1 OEM	21% of C1 replacement market
Share of C2 OEM	25% of C2 replacement market
Share of C3 OEM	25% of C3 replacement market
Number of tyres per vehicle in stock – C1 (Calculated)	5.7 (approx. 1/3 have two sets of tyres)
Number of tyres per vehicle in stock – C2 (Calculated)	4.1 (approx. 2,5% have two sets of tyres)
Number of tyres per vehicle in stock – C3 (Calculated)	12.7 (different number of wheels on different trucks/busses)

Sources: ETRMA, Ecodesign Impact Accounting

4. BAU SCENARIO ASSUMPTIONS

The following data and assumptions were used in the modelling of the current tyre labelling framework:

- The OEM performance level for RRC, WG and Noise was assumed equal to the no-label performance levels (based on 2008 Impact Assessment). I.e. only the replacement tyres are affected by the label (because very few users are actually offered a choice between different tyres when purchasing a new car, and are thus not shown the label / label values)
- 2012-2017 based on real-life data from TOL (<1% difference from GfK data) giving market distributions for rolling resistance, wet grip and noise (see tables below)
- From 2004 to 2012: Linear interpolation from 2008 Impact Assessment estimated performance in 2004 to actual data in 2012.

The review study showed a low degree of market surveillance, and the few tests that have been performed show a high rate of non-compliance. The preliminary results from the MSTyr15 project[35] showed that the non-compliance was at the magnitude of 15%. This low compliance rate is taken into account in the BAU Scenario, and an assumption regarding the magnitude of non-compliance of two classes was made:

34https://ec.europa.eu/energy/sites/ener/files/documents/Ecodesign%20Impacts%20Accounting%20%20-%20status%20January%202016%20-%20Final-20160607%20-%20N....pdf

[35] http://www.mstyr15.eu/index.php/en/

- 15% of tyres on the market do not live up to the declared performance.
- The non-compliant tyres are on average **2 classes lower** than stated on the label.

Table 4: Current label Rolling resistance market shares for C1 tyres

RRC class	A	B	C	E	F	G	Market	Market average with
Class average	6.3	7.4	8.7	10	11.5	12.4	average	non-compliance
2012	0%	3%	29%	42%	24%	1%	9.92	**10.28**
2013	1%	6%	36%	39%	17%	1%	9.64	**10.01**
2014	0%	5%	36%	43%	15%	1%	9.63	**10.00**
2015	0%	5%	38%	42%	14%	0%	9.57	**9.93**
2016	0%	5%	34%	43%	17%	1%	9.68	**10.05**
2017	0%	6%	37%	42%	15%	1%	9.59	**9.96**

Source: Data from TOL (Tyres On-Line, Germany).

Table 5: Current label Rolling resistance market shares for C2 tyres

RRC class	A	B	C	E	F	G	Market	Market average with
Class average	5.3	6.4	7.7	8.9	10.2	10.8	average	non-compliance
2012	0%	1%	26%	56%	15%	2%	8.80	**9.13**
2013	0%	4%	20%	44%	28%	3%	8.97	**9.30**
2014	0%	6%	25%	41%	25%	2%	8.82	**9.15**
2015	0%	5%	29%	40%	24%	1%	8.77	**9.10**
2016	0%	4%	25%	42%	27%	3%	8.92	**9.25**
2017	0%	4%	28%	41%	25%	2%	8.83	**9.16**

Source: Data from TOL (Tyres On-Line, Germany).

Table 6: Current label Rolling resistance market shares for C3 tyres

RRC class	A	B	C	D	E	F	Market	Market average with
Class average	3.8	4.7	5.7	6.7	7.7	8.6	average	non-compliance
2012	2%	10%	33%	37%	16%	3%	6.07	**6.43**
2013	2%	11%	33%	37%	15%	2%	6.34	**6.70**
2014	1%	10%	36%	36%	14%	2%	6.30	**6.66**
2015	1%	7%	29%	38%	20%	5%	6.28	**6.64**
2016	1%	7%	29%	40%	18%	4%	6.54	**6.90**
2017	0%	16%	44%	26%	13%	1%	6.50	**6.86**

Source: Data from TOL (Tyres On-Line, Germany).

The rolling resistance values from 2017 to 2030 in the BAU Scenario was forecasted based on historic data on market distributions of label classes. The forecasts were made for the years 2025 and 2030, and a linear interpolation of average market values was used in between.

Table 7: Forecast of fuel efficiency label distribution in the BAU scenario for C1 tyres

RRC class	A	B	C	E	F	G	Market	Market average with
Class average	5.3	6.4	7.7	8.9	10.2	10.8	average	non-compliance
2025	3%	11%	45%	40%	1%	0%	9.03	**9.40**
2030	3%	14%	48%	35%	0%	0%	8.90	**9.27**

Source: estimated based on historical development

Table 8: Forecast of fuel efficiency label distribution in the BAU scenario for C2 tyres

RRC class	A	B	C	E	F	G	Market average	Market average with non-compliance
Class average	5.3	6.4	7.7	8.9	10.2	10.8		
2025	0%	6%	40%	54%	1%	0%	8.37	**8.70**
2030	0%	6%	43%	50%	1%	0%	8.25	**8.58**

Source: estimated based on historical development

Table 9: Forecast of fuel efficiency label distribution in the BAU scenario for C3 tyres

RRC class	A	B	C	D	E	F	Market average	Market average with non-compliance
Class average	3.8	4.7	5.7	6.7	7.7	8.6		
2025	2%	8%	33%	54%	3%	0%	6.18	**6.54**
2030	2%	9%	34%	54%	1%	0%	6.13	**6.49**

Source: estimated based on historical development

The wet grip market averages and forecasts were calculated in a similar way:

Table 10: Current label Wet grip market shares for C1 tyres

Wet grip class	A	B	C	E	F	Market average	Market average with non-compliance
Class average	1.6	1.47	1.32	1.17	1.04		
2012	9%	24%	55%	8%	3%	1.36	**1.32**
2013	15%	31%	44%	7%	3%	1.39	**1.35**
2014	17%	31%	43%	7%	2%	1.40	**1.35**
2015	19%	33%	41%	7%	1%	1.41	**1.36**
2016	18%	31%	41%	9%	2%	1.40	**1.35**
2017	20%	32%	38%	7%	2%	1.41	**1.36**

Source: Data from TOL (Tyres On-Line, Germany).

Table 11: Current label Wet grip market shares for C2 tyres

Wet grip class	A	B	C	E	F	Market average	Market average with non-compliance
Class average	1.45	1.32	1.17	1.02	0.9		
2012	2%	29%	61%	8%	1%	1.21	**1.16**
2013	3%	27%	56%	13%	1%	1.20	**1.15**
2014	5%	31%	49%	15%	1%	1.21	**1.16**
2015	6%	32%	45%	17%	0%	1.21	**1.16**
2016	6%	30%	43%	20%	1%	1.20	**1.16**
2017	8%	34%	38%	18%	1%	1.22	**1.17**

Source: Data from TOL (Tyres On-Line, Germany).

Table 12: Current label Wet grip market shares for C3 tyres

Wet grip class	A	B	C	D	E	Market average	Market average with non-compliance
Class average	1.3	1.14	1	0.85	0.7		
2012	11%	65%	21%	3%	0%	1.12	**1.07**
2013	4%	46%	47%	2%	0%	1.07	**1.03**
2014	5%	47%	45%	3%	0%	1.08	**1.03**
2015	6%	53%	38%	3%	0%	1.09	**1.04**
2016	2%	39%	54%	4%	0%	1.06	**1.01**
2017	3%	42%	51%	4%	0%	1.06	**1.02**

Source: Data from TOL (Tyres On-Line, Germany).

Table 13: Forecast of wet grip label distribution in the BAU scenario for C1 tyres

Wet grip class	A	B	C	E	F	Market average	Market average with non-compliance
Class average	1.6	1.44	1.3	1.14	1		
2025	35%	30%	30%	4%	1%	1.44	**1.39**
2030	40%	31%	25%	3%	1%	1.46	**1.41**

Source: estimated based on historical development

Table 14: Forecast of wet grip label distribution in the BAU scenario for C2 tyres

Wet grip class	A	B	C	E	F	Market average	Market average with non-compliance
Class average	1.45	1.3	1.14	1.0	0.9		
2025	10%	45%	37%	8%	0%	1.23	**1.19**
2030	12%	47%	34%	7%	0%	1.24	**1.20**

Source: estimated based on historical development

Table 15: Forecast of wet grip label distribution in the BAU scenario for C3 tyres

Wet grip class	A	B	C	D	E	F	Market average	Market average with non-compliance
Class average	1.3	1.14	1	0.85	0.7	0.6		
2025	5%	47%	44%	4%	0%	0%	1.07	**1.03**
2030	5%	49%	42%	4%	0%	0%	1.08	**1.04**

Source: estimated based on historical development

The noise levels were calculated based on average measured values, and likewise forecasted to 2030 based on historical data:

Table 16: Average market noise levels in Current label scenario

Year	C1	C2	C3
2012	70.81	71.93	71.78
2013	70.67	71.98	72.19
2014	70.86	72.07	72.05
2015	70.80	72.03	71.71
2016	70.84	72.15	71.71
2017	70.73	71.97	71.69

Source: Data from TOL (Tyres On-Line, Germany).

Table 17: Forecast of average market noise levels in BAU scenario

Year	C1	C2	C3
2025	70.59	72.02	71.55
2030	70.50	72.05	71.46

Source: estimated based on historical development

5. POLICY OPTION 2 SCENARIO ASSUMPTIONS

- The same development of performance as BAU until 2017.
- Non-legislative scenario, which means the scope will not change, and hence it will only affect replacement tyres.
- Information campaigns will affect the choice only for end-users who find the parameter in question important, and who were not aware of the label beforehand. These shares were based on a consumers survey from 2016:
    - Not aware of the label: 59%
        - Assumed that the "aware" share go up from 41% to 60% → increase 19%.
        - For replacement tyres only (OEM not included).
- OEM tyres will stay on the BAU level.
- The non-compliance will decrease slightly, to 14% (with 2 classes lower than stated on the label) due to the concerted market surveillance activities

The rolling resistance values from 2017 to 2030 in the policy option 2 scenario is the same as for the BAU scenario, however, due to the information and increased market surveillance effects, the RRC changes. The same is true for Wet grip and noise levels.

6. POLICY OPTION 3 SCENARIO ASSUMPTIONS

Inclusion of snow and ice indicators on the label:

- Assume that including the 3-PMSF logo on the label will cause fewer and less severe accidents on snowy roads.
- Assume that the ice indicator on the label will cause fewer and less severe accidents on icy roads, since the ice grip performance of the tyre is oppositely correlated to the its wet grip performance, and this will inform customers to buy the correct tyres for the icy conditions.

Require all OEM tyres to be labelled / information to be given to the end-user:

- Assume that OEM tyres will improve in addition to the improvement of replacement tyres.
    - By 2025 they will follow the same development as replacement tyres.

Alignment with the Energy Labelling Framework Regulation (online labelling, registration database etc.):

- Assume that online labelling will affect the purchase for users buying online.
- The effect for each parameter affects those who found the parameter "very important" in the 2016 consumer survey, and who purchase online and / or would use the registration database to search for information:
    - Share that would use the database to search for information: 51%[36].
    - Expecting to purchase online: 21%.
        - Average of 21% and 51% = 36%.
- Re-adjustment of the label for wet grip and rolling resistance:
    - Adding a new class "A" on top means a few percent of users will buy these improved tyres (see tables below).
- Increased market surveillance and information and extension of the type approval process:
    - The non-compliance rate will fall to 7% (from 15% in BAU).

The rolling resistance values from 2017 to 2030 in the policy option 3 scenario is based on a re-adjustment the label with a new class A on top of the scale. Furthermore, the mandatory labelling of OEM tyres means that they will reach the same performance level as replacement tyres by 2025. The forecast of rolling resistance and wet grip levels for both OEM and replacement tyres are shown in the tables below. Note that these values are then affected by the additional information requirements and the changes in non-compliance.

Table 18: Forecast of fuel efficiency label distribution in the PO3 scenario for C1 tyres

RRC class	New	A	B	C	D	E	Market
Class average	5.1	6.3	7.4	8.7	10	11.5	average
2025	1%	4%	10%	44%	40%	1%	**8.99**
2030	2%	4%	13%	47%	34%	0%	**8.81**

Source: estimated based on historical development

Table 19: Forecast of fuel efficiency label distribution in the BAU scenario for C2 tyres

RRC class	New	A	B	C	D	E	Market
Class average	4.1	5.3	6.4	7.7	8.9	10.2	average
2025	0%	1%	5%	39%	54%	1%	**8.28**
2030	0%	2%	5%	42%	50%	1%	**8.21**

Source: estimated based on historical development

Table 20: Forecast of fuel efficiency label distribution in the BAU scenario for C3 tyres

RRC class	New	A	B	C	D	E	Market

36 Question: "If a public database were to be established with information on tyre performance areas shown on the label, would you use the database to search for information when purchasing new tyres in the future?" (share of those who answered "yes").

Class average	2.8	3.8	4.7	5.7	6.7	7.7	average
2025	0%	1%	8%	30%	57%	4%	**6.25**
2030	1%	1%	8%	32%	56%	2%	**6.17**

Source: estimated based on historical development

Table 21: Forecast of wet grip label distribution in the PO3scenario for C1 tyres

Wet grip class	New A	A	B	C	D	E	Market
Class average	1.71	1.6	1.44	1.3	1.14	1.0	average
2025	5%	34%	28%	29%	3%	1%	**1.45**
2030	10%	38%	29%	20%	2%	1%	**1.49**

Source: estimated based on historical development

Table 22: Forecast of wet grip label distribution in the PO3 scenario for C2 tyres

Wet grip class	New A	A	B	C	D	E	Market
Class average	1.56	1.45	1.3	1.14	1.0	0.85	average
2025	3%	10%	44%	36%	7%	0%	**1.24**
2030	6%	11%	45%	32%	6%	0%	**1.26**

Source: estimated based on historical development

Table 23: Forecast of wet grip label distribution in the PO3 scenario for C3 tyres

Wet grip class	A+	A	B	C	D	E	Market
Class average	1.41	1.3	1.14	1.0	0.85	0.7	average
2025	2%	5%	46%	45%	2%	0%	**1.08**
2030	4%	3%	51%	40%	2%	0%	**1.09**

Source: estimated based on historical development

7. POLICY OPTION 4 SCENARIO ASSUMPTIONS

Policy option 4 is a combination of policy option 2 and policy option 3, and the quantification is thus based on a model including all of the impacts form the two scenarios.

The rolling resistance values from 2017 to 2030 in the policy option 4 scenario is the same as for the policy option 2 scenario, however, due to the information and increased market surveillance effects, the RRC changes. The same is true for wet grip and noise levels.

8. EFFECT OF ROLLING RESISTANCE ON FUEL CONSUMPTION

- Based on the calculations from the official "fuel savings calculator" [37].
- Fuel savings calculator is based on measurements performed by IDIADA for the European Commission[38].

37 https://ec.europa.eu/energy/en/topics/energy-efficiency/energy-efficient-products/tyres
38 http://www.applusidiada.com/en/aboutUs/inbrief

- In the calculations a share of 50% urban driving and 50% non-urban driving was assumed.

The following formula correlating fuels savings (in %) and change in rolling resistance from the basis of the fuel savings calculator, and is the one used in this study:

$$Fuel\ consumption\ change\ (\%) = K * \frac{RRC_{old} - RRC_{new}}{RRC_{old}} * 100\%$$

Where RRC_{old} in this case refers to BAU1 (actual data), RRC_{new} refers to BAU0 rolling resistance and K is a factor calculated by IDIADA based on actual measurements of cars driven on a test lane with different tyres. The K factor depends on the type of tyre (and thus vehicle), the share of urban and non-urban driving and whether the rolling resistance is increasing or decreasing. K-factors are shown in Table 24. In the scenario calculations 50/50 share of urban and non-urban driving was assumed.

Table 24: K-factors used in calculation of fuel consumption from RRC development

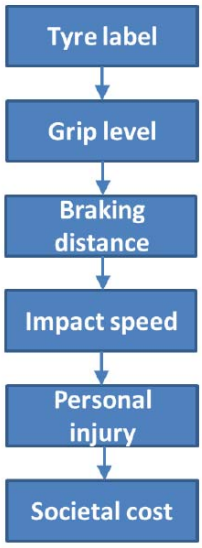
RRC development	Road type	C1	C2	C3
Increase in RRC	Urban	0.104	0.098	0.095
	Non-urban	0.158	0.118	0.112
Decrease in RRC	Urban	0.145	0.109	0.106
	Non-urban	0.183	0.125	0.118

Source: IDIADA background report on the fuel savings calculator

9. EFFECT OF WET GRIP ON SAFETY

The societal costs related to a change in tyre wet grip rating were estimated using a methodology from a 2014 study by TNO on Potentials benefits of Triple-A tyres in the Netherlands[39]. The general approach is shown in the figure below. It shows a relation between the grip level of the tyre, the braking distance and the resulting impact speed of an accident. The degree of personal injury (fatal, severe, slight) can be described as a function of impact speed. Consequently, the distribution between fatal, severe and slightly injured people can be translated into societal costs.

Figure 1 Methodology flow diagram[40]



Data and assumptions

- Data was gathered through a number of sources but are all based on data from the CARE database - **C**ommunity database on **A**ccidents on the **R**oads in **E**urope. Direct sources are referenced in footnote when relevant.
- Road accident fatalities[41] are divided into mode of transportation:
    - Passenger cars (C1 tyres)
    - Lorries <3.5 tons (C2 tyres)
    - Heavy goods vehicles >3.5 tons (C3 tyres)
    - Buses (C3 tyres)
    - Pedestrians and bicycles (assumed to be inflicted by vehicles)
- Number of injuries is not distributed by mode of transportation[42] and is therefore assumed to be the same as for fatalities. The distribution between severe and slight injuries is based on severe injuries reported in 2014[43]:
    - 10% Severely injured

39 TNO, Memorandum To Ministry of Infrastructure and Environment, "Potential benefits of Triple-A tyres in the EU" Link: http://www.unece.org/fileadmin/DAM/trans/doc/2014/wp29grb/GRB-60-13e.pdf
40 TNO, Memorandum To Ministry of Infrastructure and Environment, "Potential benefits of Triple-A tyres in the EU" Link: http://www.unece.org/fileadmin/DAM/trans/doc/2014/wp29grb/GRB-60-13e.pdf
41 https://ec.europa.eu/transport/road_safety/sites/roadsafety/files/pdf/statistics/dacota/asr2017.pdf
42 https://ec.europa.eu/transport/road_safety/sites/roadsafety/files/pdf/observatory/historical_evol.pdf
43 https://ec.europa.eu/transport/road_safety/sites/roadsafety/files/vademecum_2016.pdf

- 90% slightly injured
- The distribution of accidents by road type is divided into the following based on 2015 numbers[44]:
  - Urban – 37,3%
  - Rural – 55,0%
  - Motorway – 7,8%
  - The distribution is assumed to be the same through the whole modelling period.
- Projections of fatalities and injuries in the baseline up to 2030 are based on historic trends.

Wet grip

Wet grip refers to the capacity of a tyre to brake on a wet road. The wet grip is applicable to all tyre types (C1, C2, C3), and is determined based on the wet grip index (G) according to the A-G scale specified in Table 25. The value of the wet grip index should be calculated based on either the average deceleration in m/s^2 or the peak brake force coefficient, which is unitless, and compared to a Standard Reference Test Tyre (SRTT).

Table 25: G limit values for wet grip scales of the three tyre types C1, C2 and C3

C1 tyres		C2 tyres		C3 tyres	
G	Wet grip class	G	Wet grip class	G	Wet grip class
1,55 ≤ G	A	1,40 ≤ G	A	1,25 ≤ G	A
1,40 ≤G ≤ 1,54	B	1,25 ≤ G ≤ 1,39	B	1,10 ≤ G ≤ 1,24	B
1,25 ≤ G ≤ 1,39	C	1,10 ≤ G ≤ 1,24	C	0,95 ≤ G ≤ 1,09	C
Empty	D	Empty	D	0,8 ≤ G ≤ 0,94	D
1,10 ≤ G ≤ 1,24	E	0,95 ≤ G ≤ 1,09	E	0,65 ≤ G ≤ 0,79	E
G ≤ 1,09	F	G ≤ 0,94	F	G ≤ 0,64	F

Regulation 661/2009 sets out minimum wet grip requirements for C1 tyres only. For normal tyres the limit value is ≥1.1.

Braking distance

There is a clear relation between wet grip level and braking distance as seen in the table below. E.g. wet grip level F has a 55% longer braking distance than wet grip level A. To simplify the calculations a linear trend has been assumed making it possible to calculate the change in braking distance as a function of wet grip index (G). The ratio is assumed equal for all three tyre types (C1, C2, C3), but will of course vary due to different wet grip intervals.

44 https://ec.europa.eu/transport/road_safety/sites/roadsafety/files/pdf/statistics/dacota/asr2017.pdf

Table 26: Braking distance for different wet grip levels compared to rating A. Assumed equal for C1, C2 and C3 tyres.

Tyre label	Increased braking distance (index A=100)
A	**100**
B	**111**
C	**124**
D	**132**
E	**141**
F	**155**

Impact speed

The TNO study acquired data on the average impact speed for accidents at three different road types: urban, rural and motorway as seen in the table below. This data is assumed to be the reference in the baseline scenario.

Table 27: Average initial vehicle speed and impact speed of different accident scenarios.

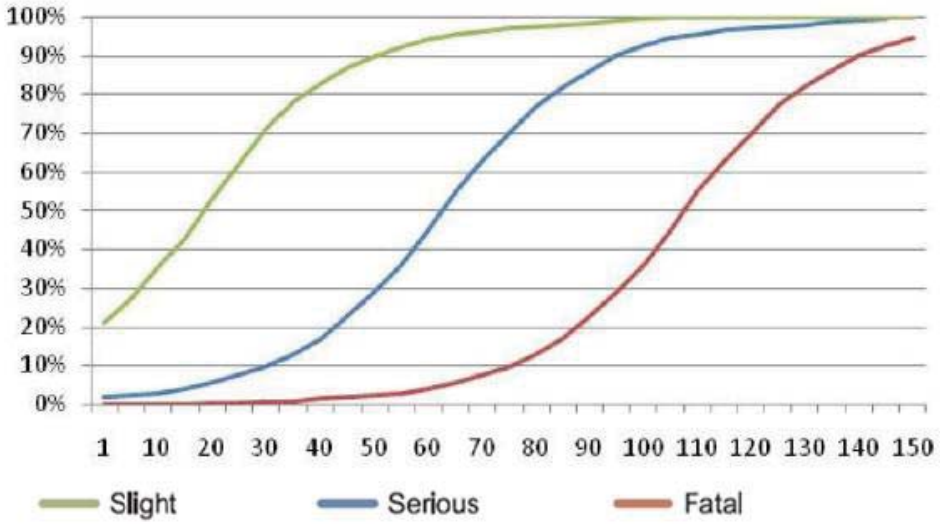
Accident scenario	**Urban road car to car**	**Rural road car to car**	**Motorway car to car**
Initial speed (km/h)	50	80	120
Impact speed (km/h)	30	46	91

For simplification it is assumed that a change in braking length will give an equal change in impact speed. E.g. a 10% reduction in braking length will reduce the impact speed in an accident by 10%. In reality, the relation between braking distance and impact speed will have an exponential trend and will vary depending on the initial speed.

Personal injury

The impact speed can be translated into injury risk for different levels of injuries (slight, serious, fatal) as seen in the figure below. The higher the impact speed the higher is the risk of a fatal accident.

Figure 2 Injury risk of passenger car occupants as a function of impact speed (km/h).[45]



Based on the average accident impact speed the distribution of injury types has been calculated in the table below. This is the baseline injury distribution. Since this is a theoretic distribution it is only used to determine the relative change for the three injury types between the baseline and each scenario. When the relative change has been calculated it can be coupled with the absolute number of fatalities, seriously injured and slightly injured in the baseline.

Table 28 Baseline distribution of injury types based on average accident impact speeds for different road types.

Road type	Impact speed (km/h)	Fatalities	Serious injuries	Slight injuries	No injury
Urban	30	1.6%	7.1%	63.4%	27.9%
Rural	46	1.8%	22.7%	62.8%	12.7%
Motorway	91	23.7%	61.2%	13.8%	1.4%

Ice and snow label

It has not been possible to acquire data on the effect of ice and snow tyres compared to regular tyres on accidents. Unlike wet grip, the ice and snow labels do not include a scale, meaning there is either a constant effect or no effect with and without the labels. As for wet grip it is assumed that improved snow and ice grip only affects accident on snowy and icy roads. The share of accidents on snowy roads were in 2015 1%[46]. There are no data for accidents on icy roads, but it has been assumed to be of the same extent as for snowy roads, being 1%. There are no data on injury type distribution (fatal, severe, slight), impact speed or braking distance from accidents on snowy and icy roads. In the baseline these are assumed equal to those used for wet road accidents. For scenarios including the ice and snow labels the effect on fatal, severe and slight accidents are assumed equal to that of wet road accidents.

45 TNO, Memorandum To Ministry of Infrastructure and Environment, "Potential benefits of Triple-A tyres in the EU" Link: http://www.unece.org/fileadmin/DAM/trans/doc/2014/wp29grb/GRB-60-13e.pdf
46 https://ec.europa.eu/transport/road_safety/sites/roadsafety/files/pdf/statistics/dacota/asr2017.pdf

10. SOCIETAL COSTS

Estimations of societal costs of accidents are based on values from the 2006 HEATCO report[47] recommended by the Commission for monetary valuation of road safety. It includes estimates for three different injury types – fatal, severe and slight – for individual countries in the EU-25. The values vary greatly between Member States and correlates to the GDP of the Member State. The valuation of the three remaining MSs has therefore been estimated based on GDP. The modelling approach uses a weighted average cost value for each injury type covering the whole of EU-28. The number of fatalities and injuries for each MS has been used as weighting factors.

Values given in the HEATCO report are 2002 prices and have therefore been converted to the current price level based on the inflation rate (see Table 29).

Table 29 Societal costs based on injury types[48]

Injury type	Societal costs thousand EUR (2017)
Fatal	1,673
Severe	251
Slight	19

11. ECONOMY AND EMPLOYMENT

The industry turnover has been used as a measure of economic impact and used to quantify employment changes within the industry.

Turnover and employment have been divided into three sectors:

- Manufacturer
- Wholesale
- Retail

Manufacturer

Data for manufacturer turnover has been acquired from EUROSTAT[49] for 2012-2016 (see Table 30). Data for number of employees are from ETRMA[50], which has been up scaled to EU-28 based on ETRMA's market share.

47 Developing Harmonised European Approaches for Transport Costing and Project Assessment - http://heatco.ier.uni-stuttgart.de/HEATCO_D5.pdf
48 Converted to 2017 price level - Developing Harmonised European Approaches for Transport Costing and Project Assessment - http://heatco.ier.uni-stuttgart.de/HEATCO_D5.pdf
49 Sold production, exports and imports (NACE Rev. 2) – Product codes 22111100, 22111355, 22111357
50http://www.etrma.org/uploads/20170912%20-%20Statistics%20booklet%202017%20-%20alternative%20rubber%20section%20FINAL%20web1.pdf and personal correspondence with ETRMA.

Table 30 Turnover and employees - tyre manufacturers

Year	Turnover million EUR	Employees	Turnover/ employee EUR
2012	17,634	257,434	68,501
2013	16,800	258,440	65,007
2014	16,813	260,124	64,635
2015	16,801	272,018	61,764
2016	16,836	281,839	59,738
Avg.	**16,977**	**265,971**	**63,929**

The average turnover of 63,929 EUR/employee was fixed throughout the whole modelling period and therefore assumed to be constant. Similarly the mark-up factor relative to the retail turnover, calculated to an average of 2, is assumed to be constant through the whole modelling period.

Wholesale

It was not possible to acquire data for either turnover or employment for the tyre wholesale sector. Instead estimates on turnover are based on a suggested mark-up factor of 1.25 relative to manufacturer turnover. Number of employees is calculated based on a labour productivity of 59,241 EUR/employee[51], which is an average for all industries. It is unknown if the tyre wholesale industry deviates from this.

Retail

The yearly retail turnover was estimated based on tyre prices and total sales numbers. The price of a tyre is determined by its combination of rolling resistance and wet grip category. The general trend is the higher the category the higher the price. Prices for C1, C2 and C3 tyres are seen in the following three tables. C1 and C2 prices are based on total sales numbers and total turnover for five major EU markets[52] giving an accurate estimate of the individual unit prices.[53] Some label class combinations have limited sales which were considered too small to give a representative estimate of the unit price. These have been adjusted based on linear interpolation and marked with a (*) in the tables below.

Similar data were not available for C3 tyres, which were therefore collected through an online web shop[54], giving a relatively low sample size. Results should therefore be considered with caution.

51 http://www.eurocommerce.eu/retail-and-wholesale-in-europe/facts-and-figures.aspx
52 Germany, France, UK, Spain, Italy
53 GfK data
54 http://www.daekonline.dk Based on 180 tyre models.

Table 31 Unit price matrix - 2017 EUR – GfK data – C1 tyres. *Identified as an outlier and adjusted

RRC – WG	A	B	C	E	F
A	121.8	92.2			
B	94.6	91.0	86.2		
C	101.4	89.9	86.4	78.1	66.3
E	124.5	96.6	76.0	73.7	73.7*
F	115.0	107.8	63.0	70.7	70.7*
G	80.7	103.3	80.0	61.8	

Table 32 Unit price matrix - 2017 EUR – GfK data – C2 tyres. *Identified as an outlier and adjusted

RRC - WG	A	B	C	E	F
A					
B	140.6	126.8	125.4*	124.6*	123.9
C	119.7	124.4	106.0	104.5	117.1
E	112.1	121.5	94.8	100.4	70.3
F	116.9	114.5	95.1	100.5	100.5*
G	77.1	77.4	81.4*	85.3	

Table 33 Unit price matrix - 2018 EUR – C3 tyres. *Identified as an outlier and adjusted[55]

RRC - WG	A	B	C	D	E
A	581,00*	555,25*	503,72		
B	520,50*	535,81	519,41		382,93
C	505,24	532,66	535,44	506,99	410,08
D	491,38*	477,60	529,07	360,48	368,68
E			546,86		

The division of each label class is too broad to track yearly developments. Therefore, the modelling is based on the exact rolling resistance coefficient (RRC) and wet grip index for each year. Consequently, unit prices must be subdivided as well, making it possible to identify a certain unit price based on a specific combination of RRC and wet grip index. The relation between label class and RRC/WG can be seen in the tables below. It is assumed that the unit price of a specific label class corresponds to the middle of the interval (given in brackets below). To calculate a specific unit price in between label classes a linear interpolation has been applied.

Table 34 Relation between label class, rolling resistance and wet grip – C1 tyres.

Label Class	RRC	WG
A	<6.6 (6.3)	>1.54 (1.6)
B	6.6 – 7.7 (7.2)	1.54 – 1.40 (1.47)
C	7.8 – 9.0 (8.4)	1.39 – 1.25 (1.32)
E	9.1 – 10.5 (9.8)	1.24 – 1.10 (1.17)
F	10.6 – 12.0 (11.3)	<1.10 (1.04)
G	>12 (12.4)	

55 http://www.daekonline.dk Based on 180 tyre models.

Table 35 Relation between label class, rolling resistance and wet grip – C2 tyres

Label Class	RRC	WG
A	<5.5 (5.3)	>1.39 (1.45)
B	5.6 – 6.7 (6.2)	1.39 – 1.25 (1.32)
C	6.8 – 8.0 (7.4)	1.24 – 1.1 (1.17)
E	8.1 – 9.2 (8.7)	1.09 – 0.95 (1.02)
F	9.3 – 10.5 (9.9)	<0.95 (0.89)
G	>10.5 (10.8)	

Table 36 Relation between label class, rolling resistance and wet grip – C3 tyres

Label Class	RRC	WG
A	<4.1 (3.8)	>1.24 (1.3)
B	4.1 – 5.0 (4.6)	1.24 – 1.1 (1.17)
C	5.1 – 6.0 (5.6)	1.09 – 0.95 (1.02)
D	6.1 – 7.0 (6.6)	0.94 – 0.8 (0.87)
E	7.1 – 8.0 (7.6)	<0.8 (0.72)
F	>8.0 (8.5)	

The average tyre unit price for a specific year is coupled with annual sales data acquired from ETRMA giving an estimate of the turnover in the retail sector. This is done for all three tyre types C1, C2 and C3. Subsequently, it is possible to calculate market turnovers for the manufacturer and wholesale sector based on estimated mark-up factors seen in the table below. Coupled with productivity data (turnover/employee) seen in the same table, the number of employees is calculated.

Table 37 Labour productivity and mark-up factors used in the modelling

Sector	**Turnover/employee EUR**	**Mark-up factors**
Retail	25,511	2
Wholesale	59,241	1.25
Manufacturer	63,929	1

12. LABEL RE-ADJUSTMENT

12.1 Wet Grip

The current distribution of tyres in wet grip class A is 20% of all C1 tyres and 8% of all C2 tyres sold in 2017, cf. Figure 3. The ongoing trend from 2015-2017 is that more tyres are placed in the top 3 classes. For C3 tyres, the trend has been opposite for class A and B. The distribution of C3 tyres in class A and B has lowered from 2012-2017, while tyres in class C-F have increased.

Figure 3a/b: Wet grip label distribution for all sold tyres 2015-2017, for C1(a) and C2(b) tyres. *Source: GfK*

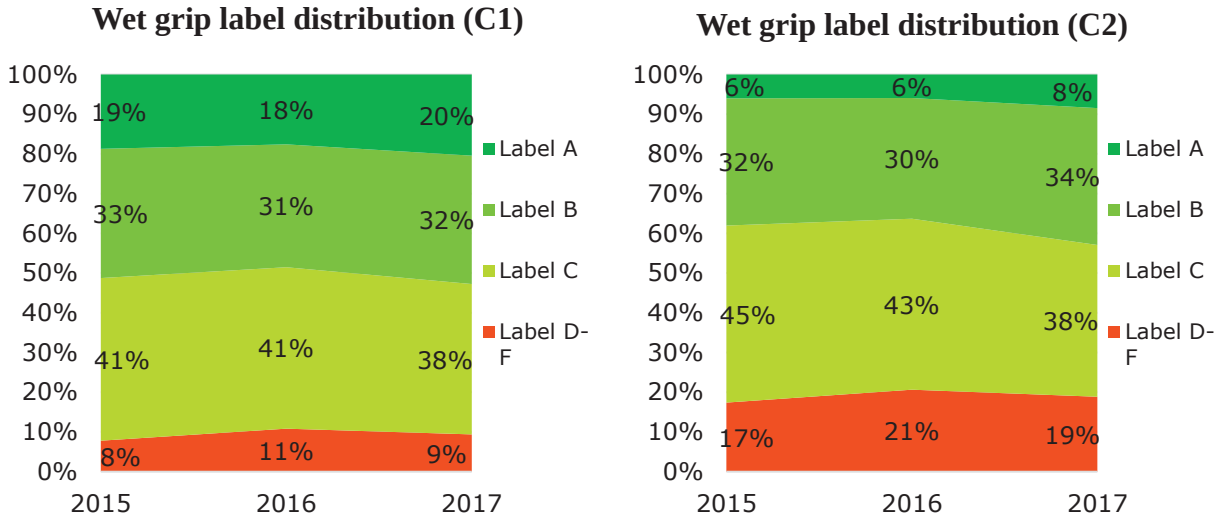
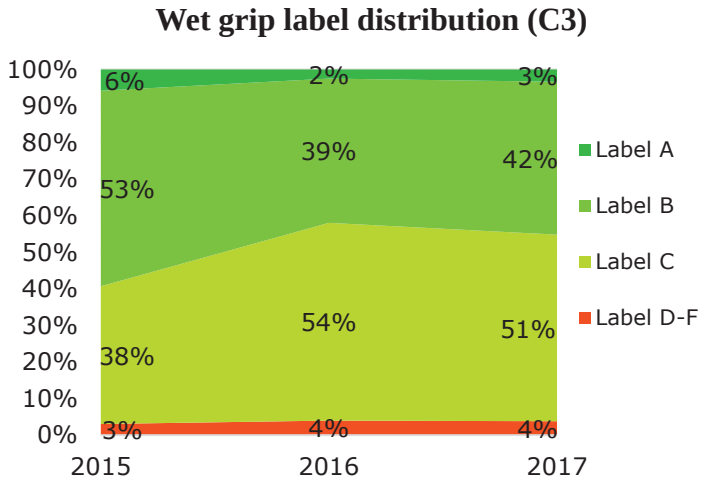


Figure 4: Wet grip label distribution for all sold C3 tyres 2015-2017. *Source: TOL*



12.2 Rolling Resistance / Fuel Efficiency

For C1/C2 tyres, the trend is similar to the wet grip performance development, as more products are placed in the top 3 categories. The A class is however currently almost empty.

For C3 tyres, the trend is again opposite. From 2012-2017, the market share of tyres in class D-F have increased from 39% in 2012, to 63% in 2017.

Figure 5a/b: Rolling resistance label distribution for all sold tyres 2015-2017, for C1(a) and C2(b) tyres. *Source: TOL*

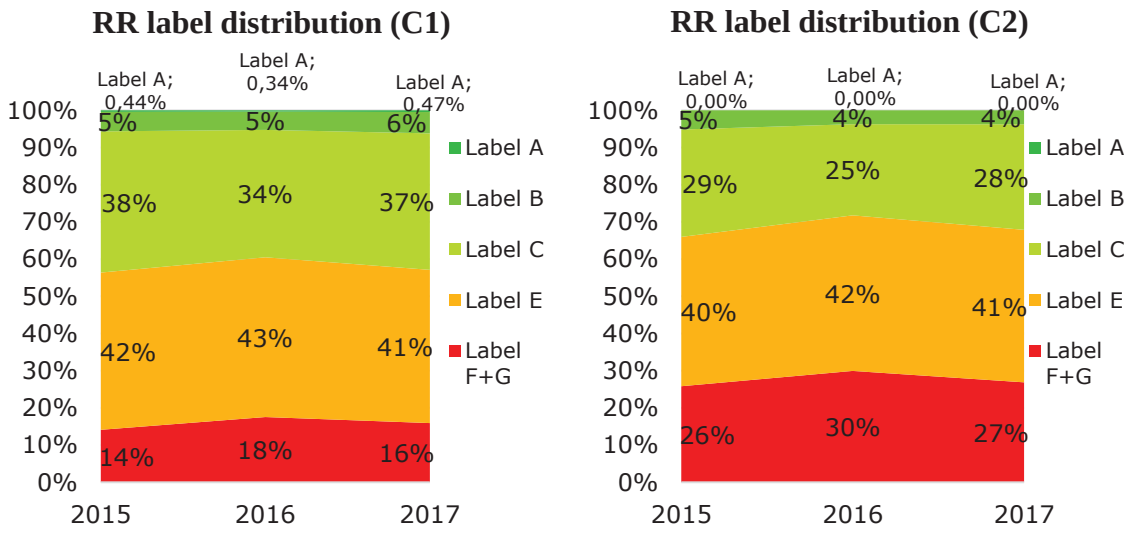
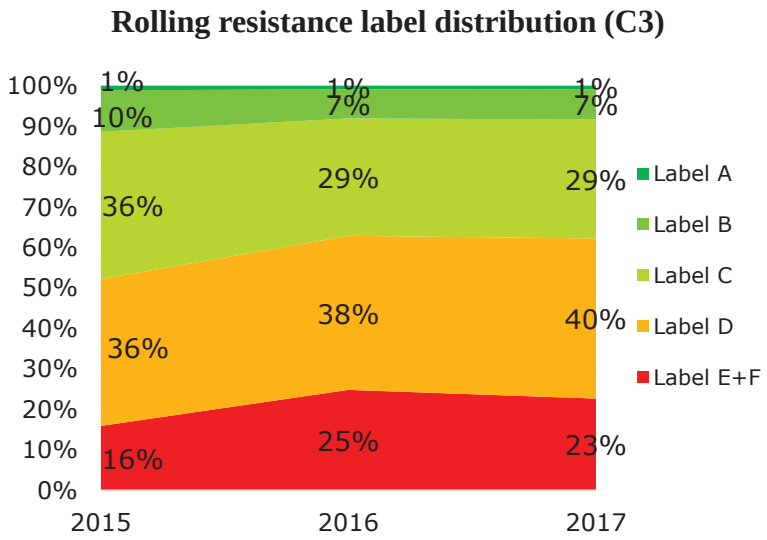


Figure 6: Rolling resistance label distribution for all sold C3 tyres 2015-2017. *Source: TOL*



The wet grip and rolling resistance / Fuel efficiency are to some extent negatively correlated. This means that very few products are in class A in both categories. Table 39 / Table 40 shows the current distribution of the tyres with both wet grip and fuel efficiency class for C1, C2, and C3 tyres respectively. While the wet grip classes are heavily distributed in classes A-C (for C1 and C2 tyres), the fuel efficiency is more evenly spaced out.

12.3 Rolling resistance / Wet grip cross distributions

Table 38: Current distribution of Rolling Resistance (RR) and Wet Grip (WG) labels for C1 tyres sold in 2017. *Source: TOL*

Rolling resistance \ Wet Grip	A	B	C	D	E	F	G	sum
A	0,2%	0,2%	0%	0%	0,0%	0,0%	0%	0%
B	2%	3%	1,1%	0%	0,1%	0,1%	0%	6%
C	11%	13%	11%	0%	1%	0,6%	0%	37%
D	0%	0%	0%	0%	0%	0%	0%	0%
E	6,5%	13%	18%	0%	4%	0,8%	0%	41%
F	1,0%	4%	7%	0%	2%	0,8%	0%	15%
G	0%	0,1%	0,3%	0%	0,2%	0,1%	0%	1%
sum	**20%**	**32%**	**38%**	**0%**	**7%**	**2%**	**0%**	

Table 39: Current distribution of Rolling Resistance (RR) and Wet Grip (WG) labels for C2 tyres sold in 2017. *Source: TOL*

Rolling resistance \ Wet Grip	A	B	C	D	E	F	G	sum
A	0,0%	0,0%	0%	0%	0,0%	0,0%	0%	0%
B	1%	2%	0,2%	0%	0,3%	0,1%	0%	4%
C	6%	14%	6%	0%	2%	0,1%	0%	28%
D	0%	0%	0%	0%	0%	0%	0%	0%
E	1,2%	11%	24%	0%	5%	0,2%	0%	41%
F	0,3%	7%	7%	0%	9%	0,5%	0%	25%
G	0%	0,5%	1,1%	0%	0,6%	0,0%	0%	2%
sum	**8%**	**34%**	**38%**	**0%**	**18%**	**1%**	**0%**	

Table 40: Current distribution of Rolling Resistance (RR) and Wet Grip (WG) labels for C3 tyres sold in 2017. *Source: TOL*

Rolling resistance \ Wet Grip	A	B	C	D	E	F	G	sum
A	0,1%	0,3%	0%	0%	0,0%	0,0%	0%	1%
B	1%	5%	2,2%	0%	0,0%	0,0%	0%	7%
C	2%	17%	11%	0%	0%	0,0%	0%	29%
D	1%	14%	23%	1%	0%	0%	0%	40%
E	0,4%	5%	12%	1%	0%	0,0%	0%	18%
F	0,1%	1%	2%	1%	0%	0,0%	0%	4%
G	0%	0,0%	0,0%	0%	0,0%	0,0%	0%	0%
sum	**3%**	**42%**	**51%**	**4%**	**0%**	**0%**	**0%**	

12.4 Noise (dB)

The noise level distributions are generally more stable than the WG/RR developments. A minor overall decrease in average noise levels at 0.03%, 0.18%, and 0.03% for C1/C2/C3

tyres respectively is seen from 2015-2017. The raw dB distributions are shown in Figure 7 and Figure 8. The average values are shown in Table 41.

Figure 7a/b: Noise level distribution for all sold tyres 2015-2017, for C1(a) and C2(b) tyres. *Source: GfK*

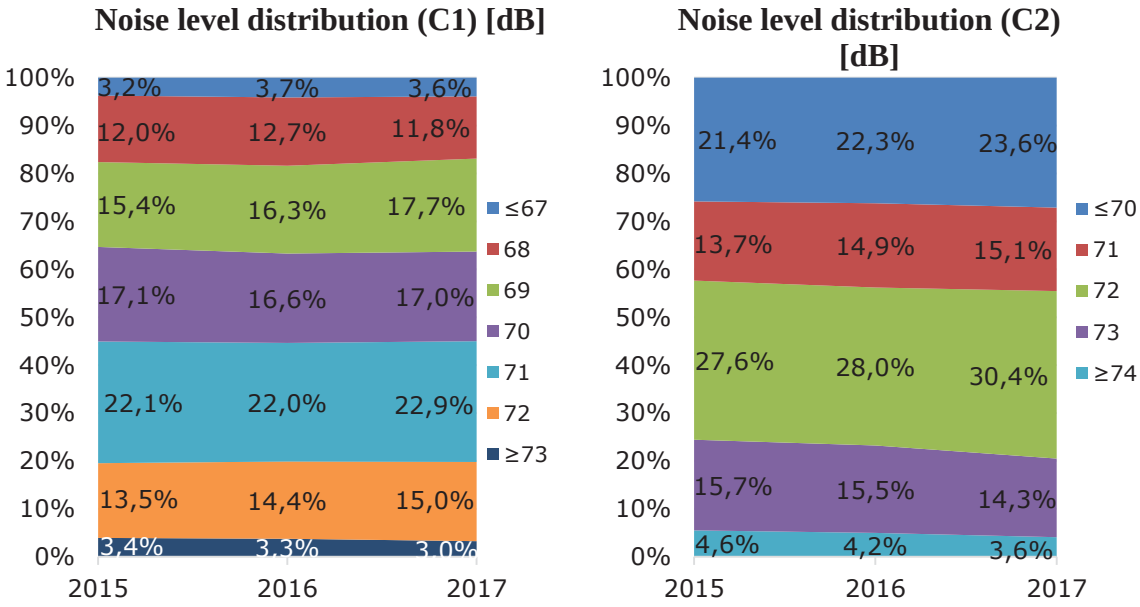


Figure 8: Noise level distribution for all available C3 tyres 2015-2017. *Source: TOL*

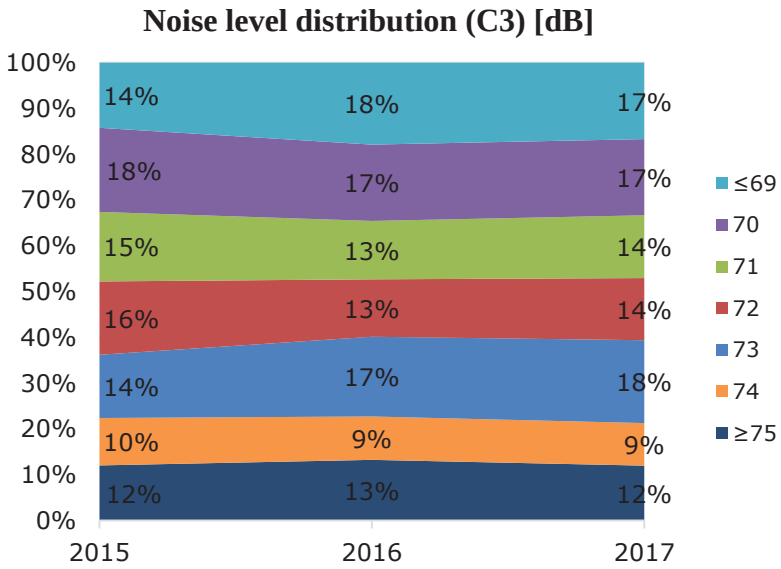


Table 41: Average noise levels for C1-C3 tyres from 2015-2017. *Source: GfK/TOL*

Avg. Noise level	2015	2016	2017
C1	70,13	70,09	70,11
C2	71,64	71,59	71,51
C3	71,71	71,71	71,69

12.5 Noise (Classes)

Besides the raw noise in dB, 3 noise classes are available on the Ecolabel. The vast majority of C1+C2 tyres are in the middle category. For C3 tyres, an almost equal

distribution between categories 1 and 2 exists. All tyre types have generally progressed towards lower noise emissions, which is consistent with the findings in Table 41. The noise level class (1-3) distribution is shown in

Figure 9 - Figure 11 for C1, C2, and C3 tyres respectively.

Figure 9: Noise class distributions for available C1 tyres in 2016-2017. *Source: TOL*

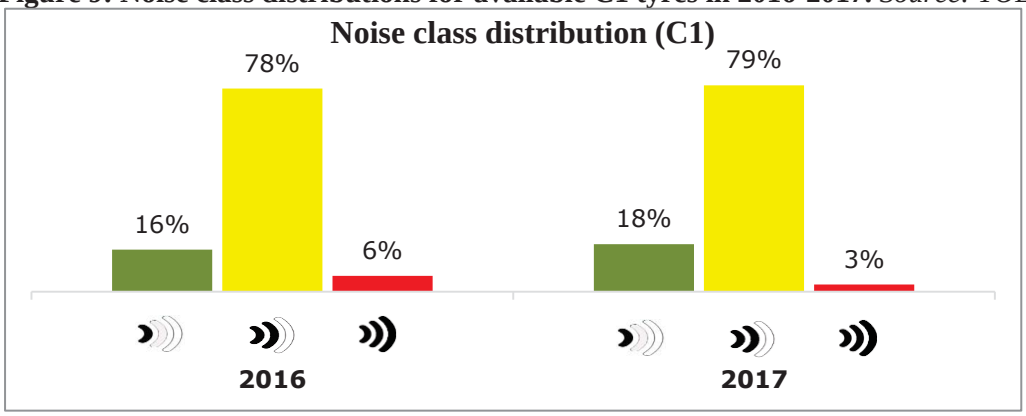


Figure 10: Noise class distributions for available C2 tyres in 2016-2017. *Source: TOL*

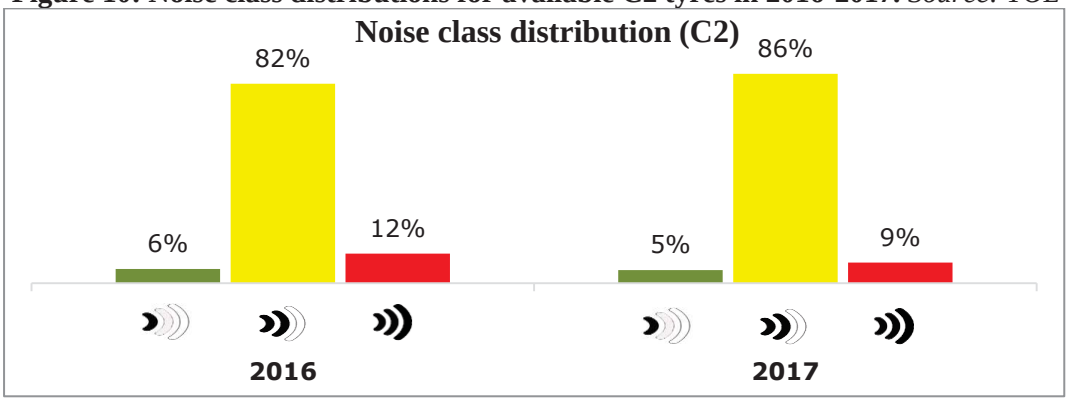
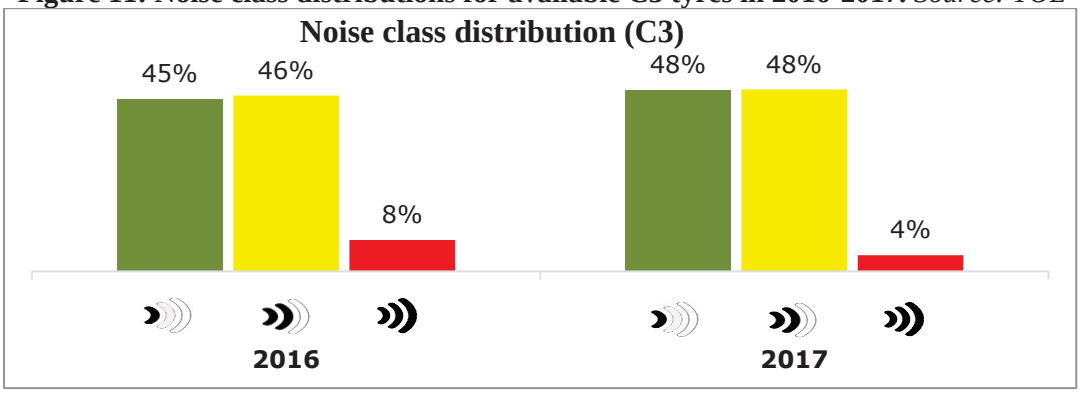


Figure 11: Noise class distributions for available C3 tyres in 2016-2017. *Source: TOL*



13. PROPOSAL TO NEW LABEL INTERVALS

In order to ensure future relevancy, and to remove the worst performing tyres on the market, new label class intervals are proposed. New top classes are introduced for each parameter, and the worst performing class is removed entirely. All stated stage 2 requirements as per the tyre-approval regulation No. 661/2009 are used as lower boundaries if available.

As current performance testing procedures have many naturally occurring uncertainties, the class interval sizes should remain constant.

Two different scenarios are proposed; Scenario 1 will introduce a new A class and readjust the remaining classes. The interval sizes will remain as they are now. The empty D class is removed. For wet grip and rolling resistance, the new A class will follow the tendency of having a mean value with +/- ~5% as upper- and lower bounds, and with top classes having narrower bands than the lower classes. The new upper boundary is hence based on a linear extrapolation on the differences (in percentages) between the other classes

Scenario 2 will restructure the intervals to 4 classes (A-D). For C1 and C2 tyres, the current intervals are kept without introducing a new A class. The empty D class is removed, and current E and F classes are restructured to fit the tier 2 requirement in the Type Approval Regulation (TAR). For C3 tyres, the classes are redistributed dependent on the current market distribution, shown in Table 59).

13.1 Scenario 1

a. Proposal to new Wet Grip index label intervals (Scenario 1)

For C1 and C2 tyres, the currently empty D class is removed, leaving both F and G classes empty. For C3 tyres, the current intervals are shifted one class down.

Table 42, 43 and 44 shows the label interval shifts for C1-C3 tyres respectively, and Table 45 and Table **46** shows the summarized current and new WG label class intervals.

Table 42: Current and new label class intervals for wet grip in C1 tyres.

Current		≥1,55	1,54-1,40	1,39–1,25	Empty	1,24–1,10	≤1,09	Empty
		A	**B**	**C**	~~**D**~~	**E**	~~**F**~~	**G**
	A	**B**	**C**	**D**	**E**	**F**	**G**	
New	≥1,68	1,67-1,55	1,54-1,40	1,39–1,25	1,24–1,10	Empty	Empty	**C1 WG**

Table 43: Current and new label class intervals for wet grip in C2 tyres

Current		≥1,40	1,39–1,25	1,24–1,10	Empty	1,09–0,95	≤0,94	Empty
		A	**B**	**C**	~~**D**~~	**E**	~~**F**~~	**G**
	A	**B**	**C**	**D**	**E**	**F**	**G**	
New	≥1,53	1,52-1,40	1,39–1,25	1,24–1,10	1,09–0,95	Empty	Empty	**C2 WG**

Table 44: Current and new label class intervals for wet grip in C3 tyres

Current		≥1,25	1,24–1,10	1,09–0,95	0,94–0,80	0,79–0,65	≤0,64	Empty
		A	**B**	**C**	**D**	**E**	~~**F**~~	**G**
	A	**B**	**C**	**D**	**E**	**F**	**G**	
New	≥1,38	1,37–1,25	1,24–1,10	1,09–0,95	0,94–0,80	0,79–0,65	Empty	**C3 WG**

Table 45: Current Wet grip class intervals

C1 tyres *(Current)*		**C2 tyres *(Current)***		**C3 tyres *(Current)***	
G	Wet grip class	G	Wet grip class	G	Wet grip class
1,55 ≤ G	A	1,40 ≤ G	A	1,25 ≤ G	A
1,40 ≤ G ≤ 1,54	B	1,25 ≤ G ≤ 1,39	B	1,10 ≤ G ≤ 1,24	B
1,25 ≤ G ≤ 1,39	C	1,10 ≤ G ≤ 1,24	C	0,95 ≤ G ≤ 1,09	C
Empty	D	Empty	D	0,8 ≤ G ≤ 0,94	D
1,10 ≤ G ≤ 1,24	E	0,95 ≤ G ≤ 1,09	E	0,65 ≤ G ≤ 0,79	E
G ≤ 1,09	F	G ≤ 0,94	F	G ≤ 0,64	F
Empty	G	Empty	G	Empty	G

Table 46: Proposed Wet grip class intervals

C1 tyres *(Proposed)*		**C2 tyres *(Proposed)***		**C3 tyres *(Proposed)***	
G	Wet grip class	G	Wet grip class	G	Wet grip class
1,68 ≤ G	A	1,53 ≤ G	A	1,38 ≤ G	A
1,55 ≤ G ≤ 1,67	B	1,40 ≤ G ≤ 1,52	B	1,25 ≤ G ≤ 1,37	B
1,40 ≤ G ≤ 1,54	C	1,25 ≤ G ≤ 1,39	C	1,10 ≤ G ≤ 1,24	C
1,25 ≤ G ≤ 1,39	D	1,10 ≤ G ≤ 1,24	D	0,95 ≤ G ≤ 1,09	D
1,10 ≤ G ≤ 1,24	E	0,95 ≤ G ≤ 1,09	E	0,80 ≤ G ≤ 0,94	E
Empty	F	Empty	F	0,65 ≤ G ≤ 0,79	F
Empty	G	Empty	G	Empty	G

b. Proposal to new Rolling Resistance index label intervals (scenario 1)

Even though the current A classes are almost empty, redistribution is nonetheless proposed so as to ensure future relevancy. The rolling resistance redistributions follow the same trend as the wet grip classes, with the currently empty D class being removed C1 and C2 tyres and shifting the C3 tyres intervals up one class.

Table 47 to Table 49 shows the label interval shifts for C1-C3 tyres respectively, and Table 50 and Table 51 shows the summarized current and new label RR class intervals.

Table 47: Current and new label class intervals for rolling resistance in C1 tyres

Current		≤6,5	6,6–7,7	7,8–9,0	Empty	9,1–10,5	10,6–12,0	≥12,1
		A	**B**	**C**	~~**D**~~	**E**	~~**F**~~	~~**G**~~
New	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**C1 RR**
	≤5,4	5,5–6,5	6,6–7,7	7,8–9,0	9,1–10,5	Empty	Empty	

Table 48: Current and new label class intervals for rolling resistance in C2 tyres

Current		≤5,5	5,6–6,7	6,8–8,0	Empty	8,1–9,0	9,3–10,5	≥10,6
		A	**B**	**C**	~~**D**~~	**E**	~~**F**~~	~~**G**~~
New	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**C2 RR**
	≤4,4	4,5–5,5	5,6–6,7	6,8–8,0	8,1–9,0	Empty	Empty	

Table 49: Current and new label class intervals for rolling resistance in C3 tyres

Current		≤4,0	4,1–5,0	5,1–6,0	6,1–7,0	7,1–8,0	≥8,1	Empty
		A	**B**	**C**	**D**	~~**E**~~	~~**F**~~	**G**
New	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**C3 RR**
	≤3,1	3,2–4,0	4,1–5,0	5,1–6,0	6,1–6,5[56]	Empty	Empty	

Table 50: Current rolling resistance class intervals

C1 tyres (current)		**C2 tyres (current)**		**C3 tyres (current)**	
RRC in kg/t	Energy efficiency class	RRC in kg/t	Energy efficiency class	RRC in kg/t	Energy efficiency class
RRC ≤ 6,5	A	RRC ≤ 5,5	A	RRC ≤ 4,0	A
6,6 ≤RRC ≤ 7,7	B	5,6 ≤RRC ≤ 6,7	B	4,1 ≤RRC ≤ 5,0	B
7,8 ≤RRC ≤ 9,0	C	6,8 ≤RRC ≤ 8,0	C	5,1 ≤RRC ≤ 6,0	C
Empty	D	Empty	D	6,1 ≤RRC ≤ 7,0	D
9,1 ≤RRC ≤ 10,5	E	8,1 ≤RRC ≤ 9,2	E	7,1 ≤RRC ≤ 8,0	E
10,6 ≤RRC ≤ 12,0	F	9,3 ≤RRC ≤ 10,5	F	RRC ≥ 8,1	F
RRC ≥ 12,1	G	RRC ≥ 10,6	G	Empty	G

56 A new upper limit is set as defined in the tyre-approval regulation No. 661/2009.

Table 51: Proposed rolling resistance class intervals

C1 tyres (proposed)		C2 tyres (proposed)		C3 tyres (proposed)	
RRC in kg/t	Energy efficiency class	RRC in kg/t	Energy efficiency class	RRC in kg/t	Energy efficiency class
RRC ≤ 5,4	A	RRC ≤ 4,4	A	RRC ≤ 3,1	A
5,5 ≤RRC ≤ 6,5	B	4,5 ≤RRC ≤ 5,5	B	3,2 ≤RRC ≤ 4,0	B
6,6 ≤RRC ≤ 7,7	C	5,6 ≤RRC ≤ 6,7	C	4,1 ≤RRC ≤ 5,0	C
7,8 ≤RRC ≤ 9,0	D	6,8 ≤RRC ≤ 8,0	D	5,1 ≤RRC ≤ 6,0	D
9,1 ≤RRC ≤ 10,5	E	8,1 ≤RRC ≤ 9,0	E	6,1 ≤RRC ≤ 6,5	E
Empty	F	Empty	F	Empty	F
Empty	G	Empty	G	Empty	G

Table 52: Current and 'Scenario 1' - proposed distribution of wet grip and rolling resistance of C1/C2/C3 tyres. *Source: GfK and TOL*

For C1:

	Current	**Wet Grip**							
	RR/WG	A	B	C	D	E	F	G	***sum***
Rolling resistance	A	0,2%	0,2%	0%	0%	0,0%	0,0%	0%	**0%**
	B	2%	3%	1,1%	0%	0,1%	0,1%	0%	**6%**
	C	11%	13%	11%	0%	1%	0,6%	0%	**37%**
	D	0%	0%	0%	0%	0%	0%	0%	**0%**
	E	6,5%	13%	18%	0%	4%	0,8%	0%	**41%**
	F	1,0%	4%	7%	0%	2%	0,8%	0%	**15%**
	G	0%	0,1%	0,3%	0%	0,2%	0,1%	0%	**1%**
	sum	**20%**	**32%**	**38%**	**0%**	**7%**	**2%**	**0%**	

	Proposed (S1)	**Wet Grip**							
	RR/WG	A	B	C	D	E	F	G	***sum***
Rolling resistance	A	0%	0,2%	0%	0%	0,0%	0,0%	0%	**0%**
	B	0%	2%	2,7%	1%	0,1%	0,0%	0%	**6%**
	C	0%	11%	13%	11%	1%	0,0%	0%	**36%**
	D	0%	0%	0%	0%	0%	0%	0%	**0%**
	E	0%	6%	13%	18%	4%	0,0%	0%	**41%**
	F	0%	1%	4%	7%	2%	0,0%	0%	**14%**
	G	0%	0,0%	0,1%	0%	0,2%	0,0%	0%	**1%**
	sum	**0%**	**20%**	**32%**	**38%**	**7%**	**0%**	**0%**	

For C2:

Current	Wet Grip							
Rolling Resistance / RR / WG	A	B	C	D	E	F	G	sum
A	0,0%	0,0%	0%	0%	0,0%	0,0%	0%	0%
B	1%	2%	0,2%	0%	0,3%	0,1%	0%	4%
C	6%	14%	6%	0%	2%	0,1%	0%	28%
D	0%	0%	0%	0%	0%	0%	0%	0%
E	1,2%	11%	24%	0%	5%	0,2%	0%	41%
F	0,3%	7%	7%	0%	9%	0,5%	0%	25%
G	0%	0,5%	1,1%	0%	0,6%	0,0%	0%	2%
sum	**8%**	**34%**	**38%**	**0%**	**18%**	**1%**	**0%**	

Proposed (S1)	Wet Grip							
Rolling Resistance / RR / WG	A	B	C	D	E	F	G	sum
A	0%	0,0%	0%	0%	0,0%	0,0%	0%	0%
B	0%	1%	1,8%	0%	0,3%	0,0%	0%	4%
C	0%	6%	14%	6%	2%	0,0%	0%	29%
D	0%	0%	0%	0%	0%	0%	0%	0%
E	0%	1%	11%	24%	5%	0,0%	0%	41%
F	0%	0%	7%	7%	10%	0,0%	0%	24%
G	0%	0,0%	0,5%	1%	0,6%	0,0%	0%	2%
sum	**0%**	**9%**	**35%**	**39%**	**18%**	**0%**	**0%**	

For C3:

Current	Wet Grip							
Rolling resistance / RR / WG	A	B	C	D	E	F	G	sum
A	0,1%	0,3%	0%	0%	0,0%	0,0%	0%	1%
B	1%	5%	2,2%	0%	0,0%	0,0%	0%	7%
C	2%	17%	11%	0%	0%	0,0%	0%	29%
D	1%	14%	23%	1%	0%	0%	0%	40%
E	0,4%	5%	12%	1%	0%	0,0%	0%	18%
F	0,1%	1%	2%	1%	0%	0,0%	0%	4%
G	0%	0,0%	0,0%	0%	0,0%	0,0%	0%	0%
sum	**3%**	**42%**	**51%**	**4%**	**0%**	**0%**	**0%**	

Proposed (S1)	Wet Grip							
Rolling resistance / RR / WG	A	B	C	D	E	F	G	sum
A	0,0%	0,1%	0%	1%	0,0%	0,0%	0%	1%
B	0%	1%	4,7%	2%	0,2%	0,0%	0%	8%
C	0%	2%	17%	11%	0%	0,0%	0%	31%
D	0%	1%	15%	24%	1%	0%	0%	41%
E	0,0%	0%	5%	12%	1%	0,2%	0%	19%
F	0,0%	0%	0%	0%	0%	0,0%	0%	0%
G	0%	0,0%	0,0%	0%	0,0%	0,0%	0%	0%
sum	**0%**	**3%**	**43%**	**51%**	**3%**	**0%**	**0%**	

c. Proposal to new Noise level label intervals (Scenario 1 and 2)

The noise class intervals are based on the limit value (LV) set out in Part C of Annex II of Regulation (EC) No 661/2009, and the actual external rolling noise measured value (N). The proposed redistribution shown in Table removes all tyres surpassing the rolling noise limit value. Furthermore, it introduces a new top class.

Table 53: Current and new label class intervals for noise for all tyre types

Class			
Current	**N** ≤ LV – 3	LV – 3 < **N** ≤ LV	**N** > LV
New	**N** ≤ LV – 6	LV – 6 < **N** < LV – 3	LV – 3 < **N** ≤ LV

13.2 Scenario 2

a. Proposal to new Wet Grip index label intervals (Scenario 2)

For C1/C2 tyres, the empty D class is removed. Classes E and F are combined into a new D class. For C3 tyres, the classes are combined based on the current market distributions (See Table 58). This will combine classes A and B into a new A class, and classes E and F into a new D class, visualized in Table . The current and proposed wet grip classes can be seen in Table 54 and Table 55.

Table 54: Current and new label class intervals for wet grip in C3 tyres. Scenario 2

Current	≥1,25	1,24–1,10	1,09–0,95	0,94–0,80	0,79–0,65	≤0,64	Empty	
	A	**B**	**C**	**D**	**E**	**F**	**G**	
New	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**C3 WG S2**
	≥1,10	1,09–0,95	0,94–0,80	≤0,79	Empty	Empty	Empty	

Table 55: Current Wet grip class intervals

C1 tyres *(Current)*		**C2 tyres *(Current)***		**C3 tyres *(Current)***	
G	Wet grip class	G	Wet grip class	G	Wet grip class
1,55 ≤ G	A	1,40 ≤ G	A	1,25 ≤ G	A
1,40 ≤ G ≤ 1,54	B	1,25 ≤ G ≤ 1,39	B	1,10 ≤ G ≤ 1,24	B
1,25 ≤ G ≤ 1,39	C	1,10 ≤ G ≤ 1,24	C	0,95 ≤ G ≤ 1,09	C
Empty	D	Empty	D	0,8 ≤ G ≤ 0,94	D
1,10 ≤ G ≤ 1,24	E	0,95 ≤ G ≤ 1,09	E	0,65 ≤ G ≤ 0,79	E
G ≤ 1,09	F	G ≤ 0,94	F	G ≤ 0,64	F
Empty	G	Empty	G	Empty	G

Table 56: Proposed Wet grip class intervals. Scenario 2

C1 tyres *(Proposed)*		**C2 tyres *(Proposed)***		**C3 tyres *(Proposed)***	
G	Wet grip class	G	Wet grip class	G	Wet grip class
1,55 ≤ G	A	1,40 ≤ G	A	1,10 ≤ G	A
1,40 ≤ G ≤ 1,54	B	1,25 ≤ G ≤ 1,39	B	0,95 ≤ G ≤ 1,09	B
1,25 ≤ G ≤ 1,39	C	1,10 ≤ G ≤ 1,24	C	0,8 ≤ G ≤ 0,94	C
G ≤ 1,24	D	G ≤ 1,09	D	G ≤ 0,79	D
Empty	E	Empty	E	Empty	E
Empty	F	Empty	F	Empty	F
Empty	G	Empty	G	Empty	G

b. Proposal to new Rolling Resistance index label intervals (Scenario 2)

For C1/C2 tyres, the empty D class is removed. Regulation No. 661/2009 naturally removes classes F and G. The current E class is thus renamed to the new D class.

For C3 tyres, the regulation removes classes E and F, which results in 4 total classes. The current and proposed rolling resistance classes can be seen in Table and 57.

Table 57: Current rolling resistance class intervals

C1 tyres (current)		**C2 tyres (current)**		**C3 tyres (current)**	
RRC in kg/t	Energy efficiency class	RRC in kg/t	Energy efficiency class	RRC in kg/t	Energy efficiency class
RRC ≤ 6,5	A	RRC ≤ 5,5	A	RRC ≤ 4,0	A
6,6 ≤RRC ≤ 7,7	B	5,6 ≤RRC ≤ 6,7	B	4,1 ≤RRC ≤ 5,0	B
7,8 ≤RRC ≤ 9,0	C	6,8 ≤RRC ≤ 8,0	C	5,1 ≤RRC ≤ 6,0	C
Empty	D	Empty	D	6,1 ≤RRC ≤ 7,0	D
9,1 ≤RRC ≤ 10,5	E	8,1 ≤RRC ≤ 9,2	E	7,1 ≤RRC ≤ 8,0	E
10,6 ≤RRC ≤ 12,0	F	9,3 ≤RRC ≤ 10,5	F	RRC ≥ 8,1	F
RRC ≥ 12,1	G	RRC ≥ 10,6	G	Empty	G

Table 58: Proposed rolling resistance class intervals. Scenario 2

C1 tyres (proposed)		**C2 tyres (proposed)**		**C3 tyres (proposed)**	
RRC in kg/t	Energy efficiency class	RRC in kg/t	Energy efficiency class	RRC in kg/t	Energy efficiency class
RRC ≤ 6,5	A	RRC ≤ 5,5	A	RRC ≤ 4,0	A
6,6 ≤RRC ≤ 7,7	B	5,6 ≤RRC ≤ 6,7	B	4,1 ≤RRC ≤ 5,0	B
7,8 ≤RRC ≤ 9,0	C	6,8 ≤RRC ≤ 8,0	C	5,1 ≤RRC ≤ 6,0	C
RRC ≥ 9,1	D	RRC ≥ 8,1	D	RRC ≥ 6,1	D
Empty	E	Empty	E	Empty	E
Empty	F	Empty	F	Empty	F
Empty	G	Empty	G	Empty	G

Table 59: Current and 'Scenario 2' - proposed distribution of wet grip and rolling resistance of C1/C2/C3 tyres. *Source: GfK and TOL*

For C1:

Rolling resistance	Current	Wet Grip							
	RR/WG	A	B	C	D	E	F	G	sum
	A	0,2%	0,2%	0%	0%	0,0%	0,0%	0%	0%
	B	2%	3%	1,1%	0%	0,1%	0,1%	0%	6%
	C	11%	13%	11%	0%	1%	0,6%	0%	37%
	D	0%	0%	0%	0%	0%	0%	0%	0%
	E	6,5%	13%	18%	0%	4%	0,8%	0%	41%
	F	1,0%	4%	7%	0%	2%	0,8%	0%	15%
	G	0%	0,1%	0,3%	0%	0,2%	0,1%	0%	1%
	sum	20%	32%	38%	0%	7%	2%	0%	

Rolling resistance	Proposed (S2)	Wet Grip							
	RR/WG	A	B	C	D	E	F	G	sum
	A	0,2%	0,2%	0,1%	0,0%	0,0%	0,0%	0%	0%
	B	1,8%	2,7%	1,1%	0,2%	0,0%	0,0%	0%	6%
	C	10,9%	12,9%	11,3%	1,8%	0%	0,0%	0%	37%
	D	7,5%	16,5%	25,4%	7,4%	0%	0%	0%	57%
	E	0,0%	0%	0%	0%	0%	0,0%	0%	0%
	F	0,0%	0%	0%	0%	0%	0,0%	0%	0%
	G	0%	0,0%	0,0%	0%	0,0%	0,0%	0%	0%
	sum	20%	32%	38%	9%	0%	0%	0%	

For C2:

Rolling Resistance	Current	Wet Grip							
	RR / WG	A	B	C	D	E	F	G	sum
	A	0,0%	0,0%	0%	0%	0,0%	0,0%	0%	0%
	B	1%	2%	0,2%	0%	0,3%	0,1%	0%	4%
	C	6%	14%	6%	0%	2%	0,1%	0%	28%
	D	0%	0%	0%	0%	0%	0%	0%	0%
	E	1,2%	11%	24%	0%	5%	0,2%	0%	41%
	F	0,3%	7%	7%	0%	9%	0,5%	0%	25%
	G	0%	0,5%	1,1%	0%	0,6%	0,0%	0%	2%
	sum	8%	34%	38%	0%	18%	1%	0%	

Rolling Resistance	Proposed (S2)	Wet Grip							
	RR / WG	A	B	C	D	E	F	G	sum
	A	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0%	0%
	B	1,5%	1,8%	0,2%	0,3%	0,0%	0,0%	0%	4%
	C	5,5%	14,3%	6,1%	2,4%	0%	0,0%	0%	28%
	D	1,5%	18,3%	32,0%	16,1%	0%	0%	0%	68%
	E	0,0%	0%	0%	0%	0%	0,0%	0%	0%
	F	0,0%	0%	0%	0%	0%	0,0%	0%	0%
	G	0%	0,0%	0,0%	0%	0,0%	0,0%	0%	0%
	sum	8%	34%	38%	19%	0%	0%	0%	

For C3:

Rolling resistance	*Current*	Wet Grip							
	RR / WG	A	B	C	D	E	F	G	***sum***
	A	0,1%	0,3%	0%	0%	0,0%	0,0%	0%	**1%**
	B	1%	5%	2,2%	0%	0,0%	0,0%	0%	**7%**
	C	2%	17%	11%	0%	0%	0,0%	0%	**29%**
	D	1%	14%	23%	1%	0%	0%	0%	**40%**
	E	0,4%	5%	12%	1%	0%	0,0%	0%	**18%**
	F	0,1%	1%	2%	1%	0%	0,0%	0%	**4%**
	G	0%	0,0%	0,0%	0%	0,0%	0,0%	0%	**0%**
	sum	**3%**	**42%**	**51%**	**4%**	**0%**	**0%**	**0%**	

Rolling resistance	*Proposed (S2)*	Wet Grip							
	RR / WG	A	B	C	D	E	F	G	***sum***
	A	0,4%	0,5%	0,0%	0,0%	0,0%	0,0%	0%	**1%**
	B	5,1%	2,2%	0,1%	0,0%	0,0%	0,0%	0%	**7%**
	C	18,2%	10,7%	0,4%	0,0%	0%	0,0%	0%	**29%**
	D	21,4%	37,5%	3,0%	0,4%	0%	0%	0%	**62%**
	E	0,0%	0%	0%	0%	0%	0,0%	0%	**0%**
	F	0,0%	0%	0%	0%	0%	0,0%	0%	**0%**
	G	0%	0,0%	0,0%	0%	0,0%	0,0%	0%	**0%**
	sum	**45%**	**51%**	**4%**	**0%**	**0%**	**0%**	**0%**	

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PART 3/3

COMMISSION STAFF WORKING DOCUMENT

IMPACT ASSESSMENT

Accompanying the document

Proposal for a Regulation of the European Parliament and of the Council

on the labelling of tyres with respect to fuel efficiency and other essential parameters, and repealing Regulation (EC) No 1222/2009

{COM(2018) 296 final} - {SEC(2018) 234 final} - {SWD(2018) 188 final}

Annex 5: Evaluation

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Glossary for the evaluation report

Term or acronym	*Meaning or definition*
RRC	Rolling Resistance Coefficient
WG	Wet Grip
BAU	Business as Usual – no label (Before regulation)
OPC	Open Public Consultation
SRTT	Standard Reference Test Tyre
MSA	Market Surveillance Authority
C1 Tyres	Passenger car tyres
C2 Tyres	Light commercial vehicle tyres
C3 Tyres	Medium and Heavy commercial vehicle tyres
LCV	Light Commercial Vehicle
HCV	Heavy Commercial Vehicle
TCO	Total Cost of Ownership
LCC	Life Cycle Cost
GHG emissions	Greenhouse Gas emissions
OEM tyres	Original Manufacturer Equipment tyres, sold with new vehicles

1. Introduction - Purpose and scope of the evaluation

The Tyre Labelling Regulation 1222/2009[1] (hereafter called '**TLR**') was one of the initiatives set out in the Commission Communication of 8 July 2008 entitled Greening Transport[2] that aimed at increasing the sustainability of the transport sector and contributing to achieve the EU 2020 Strategy on climate change and energy targets[3].

Car tyres were identified as an important factor that impacts the fuel consumption and pollution from road traffic, as 5% to 10% of fuel consumption is caused by the tyre rolling resistance[4]. Furthermore, the grip of the tyres on wet road and the external rolling noise are important parameters for increasing road safety and decreasing noise pollution from road traffic, respectively.

The TLR was implemented to improve the performance of tyres sold in the EU with respect to the fuel efficiency, wet grip and external rolling noise.

Pursuant to article 14[5] of the TLR, it should be reviewed by March 2016, in regard of which a review study was carried out[6]. Based on the results from this 2016 Review Study, the Commission decided to carry out an evaluation.

The purpose of the evaluation is to **quantify the effect of introducing the TLR** separately from the effect of the GSR. The intention is to determine the effect the label has had on the tyre market, after five years of application of the tyre labelling scheme in the European Union, in terms of increased performance in fuel efficiency, safety and environmental noise by assessing the three performance parameters of the label; rolling resistance, wet grip and external rolling noise.

Furthermore, the purpose of the evaluation is to **determine whether the TLR has been effective and efficient in achieving its objectives**, **whether it is still relevant**, and **whether it is coherent with other EU regulations** and **brings added value to the EU tyre market**. By answering these questions, the evaluation helps ultimately to **identify the potential for improving the regulation** to better achieve its objectives, thus supporting the Impact Assessment's policy options.

The evaluation looks at the development of tyre performance in all EU Member States from 2005 to 2017, thus including the progress that took place in the years before the Regulation started to apply in November 2012.

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1 Regulation (EC) No 1222/2009 of the European Parliament and of the Council of 25 November 2009 on the labelling of tyres with respect to fuel efficiency and other essential parameters, OJ L 342 of 22.12.2009, p.46

2 https://ec.europa.eu/transport/themes/strategies/2008_greening_transport_en

3 https://ec.europa.eu/info/business-economy-euro/economic-and-fiscal-policy-coordination/eu-economic-governance-monitoring-prevention-correction/european-semester/framework/europe-2020-strategy_en

4 http://www.npc.org/reports/FTF-report-080112/Chapter_10-HD_Engines-Vehicles.pdf and https://www.fueleconomy.gov/feg/atv.shtml

5 The Commission shall assess the need to review this Regulation, presenting the result of this assessmentto the European Parliament and the Council no later than 1 March2016, and, if appropriate, submit proposals to the European Parliament and to the Council

6 https://ec.europa.eu/energy/sites/ener/files/documents/Study%20in%20support%20of%20the%20Review%20of%20the%20Tyre%20Labelling%20Regulation_final.pdf

2. Background to the intervention

2.1. DESCRIPTION OF THE INTERVENTION AND ITS OBJECTIVES

The TLR was designed to promote sustainable mobility in the light of the climate change challenges and the need to support European competitiveness.

The TLR was introduced simultaneously with the Regulation on type approval of "general safety of motor vehicles, their trailers and systems, components and separate technical units intended therefore"[7] (hereafter the "**General Safety Regulation**" or "**GSR**"). The GSR sets minimum requirements for tyre performance in terms of rolling resistance and external rolling noise as well as wet grip for certain tyre types.

The two Regulations are intended to work in synergy; the GSR pushing the tyre market towards higher performance by removing the lowest performing tyres from the Union market, and the label introduced by the TLR pulling the market towards even higher performance by providing end-users with the necessary information to identify and purchase the best performing tyres on the market.

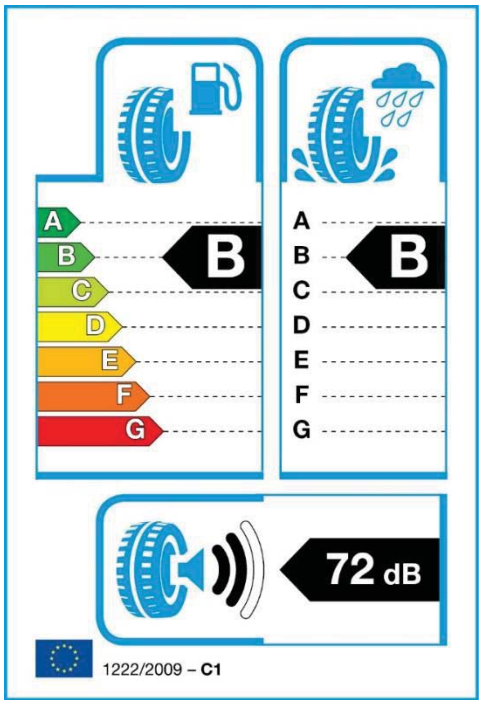
Before the implementation of the TLR, end-users did not have access to any harmonized and reliable information about the fuel efficiency of tyres. Therefore, they were not able to incorporate the possible fuel savings in their purchase decision.

The TLR was set up to encourage:

- tyre manufacturers to optimise all three interrelated label parameters (rolling resistance, external rolling noise and wet grip for certain tyre types) beyond the minimum requirements in the GSR.
- end-users to purchase more fuel-efficient tyres to reduce the environmental impact of road transport.
- end-users to purchase tyres with low external rolling noise to reduce traffic noise.
- end-users to purchase tyres with high wet grip performance to improve road safety.

The TLR sets out harmonised requirements on tyre parameter information to be provided to end-users allow them to make informed purchasing choices. Three tyre performance parameters are included: fuel efficiency, wet grip, and external rolling noise class and measured value (in dB). An element of complexity is that improving one parameter such as rolling resistance may have an adverse impact on other parameters such as wet grip, while improving wet grip may have an adverse impact on external rolling noise.

Figure 12: Example of the tyre label



a. Scope of the intervention

The TLR applies to C1, C2 and C3 tyres, as defined in article 8 of the GSR (C1 tyres can generally be said to be tyres for passenger cars, C2 tyres for light commercial vehicles (LCVs) and C3 tyres for heavy commercial vehicles (HCV's). The definition of the tyre types is based on the vehicles they are primarily designed for, including the weight and passenger capacity, and on the tyre load and speed indexes of the tyres, as seen in Table 1. In general, C1 tyres can be said to be tyres for passenger cars, C2 tyres for light commercial vehicles (LCVs) and C3 tyres for heavy commercial vehicles (HCV's)[8].

Table 59: Definition of tyre types included in the TLR, based on Regulation (EC) 661/2009

Tyre type	Designed primarily for vehicle categories	Seats in addition to driver's seat (based on vehicle category)	Vehicle weight (based on vehicle category)	Load capacity index	Speed category symbol
C1 tyres	M_1, N_1, O_1 and O_2	≤8	≤3.5 t	Not applicable	Not applicable
C2 tyres	M_2, M_3, N, O_3 and O_4	≥8	≥3.5 t	≤121	≥N
C3 tyres	M_2, M_3, N, O_3 and O_4	≥8	≥3.5 t	≤121	≤M
				≥122	none

The TLR does not apply to the following tyre types:

- re-treaded tyres;

8 European Commission (2014), "Frequently Asked Questions (Version 25/11/2014) for Regulation (EC) No 1222/2009 of the European Parliament and of the Council. Link: http://ec.europa.eu/energy/sites/ener/files/documents/faq_-_tyre_labelling.pdf

- off-road professional tyres;
- tyres designed to be fitted only to vehicles registered for the first time before 1 October 1990;
- T-type temporary-use spare tyres;
- tyres whose speed rating is less than 80 km/h;
- tyres whose nominal rim diameter does not exceed 254 mm or is 635 mm or more;
- tyres designed only to be fitted on vehicles intended exclusively for racing.
- tyres fitted with additional devices to improve traction properties, such as studded tyres.

The TRL requires C1 and C2 tyres to bear the label. For C3 tyres the label is not required but the information on rolling resistance, wet grip and rolling noise needs to be included in the promotional documentation.

b. The intervention logic

Objectives of the TLR. The tyre label was introduced to provide end-users with information on tyre parameters so that they can make an informed choice, and to influence their purchase decisions in favour of more fuel efficient, safer, and quieter tyres. Furthermore, it incentivises manufacturers to optimise those tyre parameters, paving the way for more sustainable consumption and production.

Problems the TLR aimed to solve. The tyre label was designed based on the experience from the effect of the EU energy labelling scheme for household appliances (under Directive 1992/75/EC), which had shown that energy labelling can have a significant influence on consumer choice and market transformation towards more energy-efficient products.

Before introducing the TLR, the absence of information gave rise to a market failure preventing tyre end-users to consider fuel efficiency and related impacts in their purchasing decisions. More concretely, the market failure identified by the Commission's impact assessment[9] prior to proposing Regulation (EC) No 1222/2009 consisted of:

- *lack of information on the rolling resistance of tyres* – the criteria for buying tyres was influenced by price, size, appearance, alignment, etc. End-users had no information on tyre rolling resistance;
- *lack of information on the relative energy efficiency of tyres* – no tangible or transparent way for an end-user to understand a tyre's capability to increase a vehicle's fuel economy and to secure fuel cost savings;
- *lack of information on the range of tyre attributes* – end-users need to understand better the interplay between the different tyre attributes (fuel efficiency, tyre

9 Impact Assessment COM(2008)779, SEC(2008)2861,
Link: http://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1458040597506&uri=CELEX:52008SC2860
Study EPEC 2008; "Impact Assessment Study on Possible Energy Labelling of Tyres".
Link: https://circabc.europa.eu/sd/a/99ffc67c-4422-4a38-9995-e41e3a40c333/Technical%20Study%20on%20Possible%20Energy%20Labelling%20of%20Tyres.pdf

safety and noise) to make rational choices between tyres with different properties depending on end-user preferences.

The consequence of the market failure was an unexploited potential for lowering the rolling resistance and rolling noise while increasing the wet grip performance.

The mechanisms set in place by the TLR. The tyre labelling Regulation introduced a label for tyres as seen above that includes three interrelated performance parameters:

- **Fuel efficiency**: The fuel efficiency of tyres is defined in terms of the *Rolling Resistance Coefficient* (**RRC**), given as kg resistance per ton of vehicle (kg/t). The lower the value for RRC, the better the fuel efficiency of the tyre.
- **Wet grip**: Wet grip refers to the safety performance of tyres, i.e. it reflects the capacity of a tyre to brake on a wet road. Wet grip is determined based on the wet grip index (G), calculated based on either the average deceleration in m/s^2 or the peak brake force coefficient, which is unit-less, and compared to a Standard Reference Test Tyre (**SRTT**). The better the wet grip, the safer the tyre.
- **External rolling noise**: The external rolling noise refers to the noise of the tyres experienced outside the car (i.e. not by the driver or passengers). The external rolling noise (N) is measured in decibel (dB).

The interrelation of the three parameters means that improving one may have an adverse effect on another, due to the physical and chemical characteristics of the tyres. While the best performing tyres, especially those with high performance in all parameters, generally have a higher purchase price, the total cost of ownership (**TCO**), also called life cycle cost (**LCC**) for the consumer is often lower for tyres with low rolling resistance due to the increased fuel efficiency and the accompanying fuel cost savings over the whole life of the tyre. To help end-users make an informed decision the label therefore shows the rolling resistance converted to an A-G fuel efficiency scale. To avoid trade-offs in safety and noise pollution while improving the rolling resistance, the wet grip scale is shown next to the fuel efficiency scale on the label and the external rolling noise is added as a three-step scale (1 to 3 "sound waves") below. This is intended to increase the demand for tyres that have high performance in all three parameters in spite of the additional purchase cost, which in turn is intended to encourage manufacturers to increase innovation rate and optimise all three label parameters beyond the standard performance. The synergy between the three parameters is therefore important, and end-users need information on all three to make an informed purchasing decision.

2.2. BASELINE AND POINTS OF COMPARISON (BAU)

The base line of this evaluation will be the market without the implementation of the TLR but including the effect of the type-approval process of the GSR. This baseline is also referred to as Business as Usual (**BAU**).

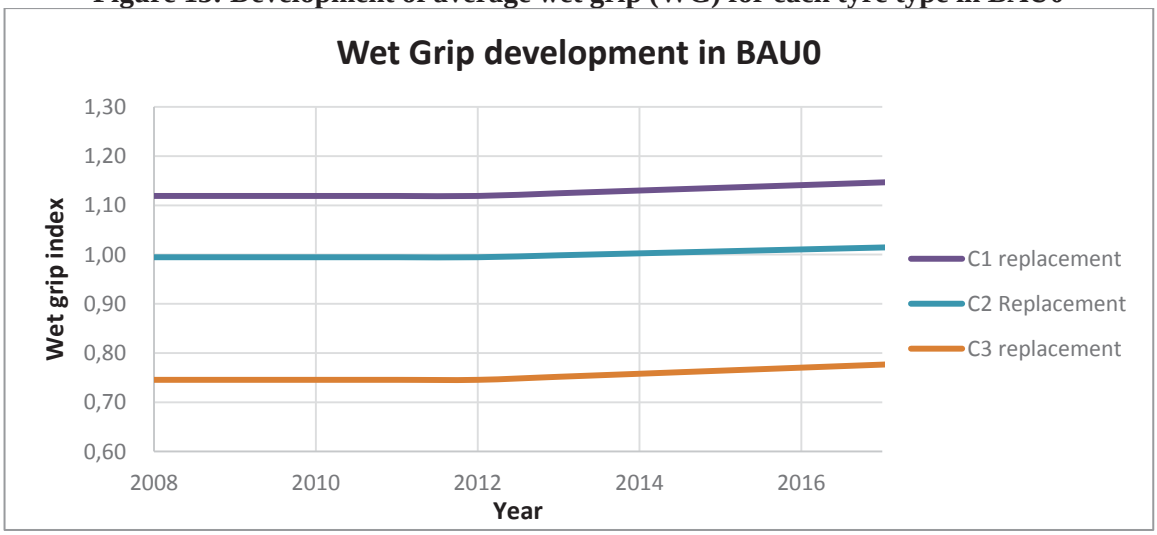
The development in the BAU scenario is based on the future market estimates made in the 2008 Impact Assessment under the no-label scenario for the years 2004-2017 for C1 and C2 tyres. However, for C3 tyres the future market estimates for the no-label scenario

resulted in better tyre performance than can be observed from real-life data in the market *with* the label. The C3 BAU scenario was therefore adjusted to a more realistic level, taking into consideration the available market data from a German tyre model database[10]. The assumed distribution can be seen in Appendix 2.

In the 2008 Impact Assessment only the rolling resistance was included as a performance parameter in the scenarios, while noise was not included at all and the wet grip was only mentioned superficially and only for C1. The wet grip and noise market levels therefore had to be estimated in the development of another Business as Usual scenario BAU0 using market data from 2008 until 2017. The data and estimates are shown in Appendix 2. .

The figures and table below show the BAU development for each label parameter (rolling resistance, wet grip and noise) for C1, C2 and C3 tyres. The change occurring around 2012 is induced by the GSR that sets minimum requirements for rolling resistance and noise for all three tyres types (C1, C2, C3) as well as for wet grip on C1 tyres. Further limitations on maximum rolling resistance were introduced from 2014 for C1 and C2 tyres and from 2016 for C3 tyres.

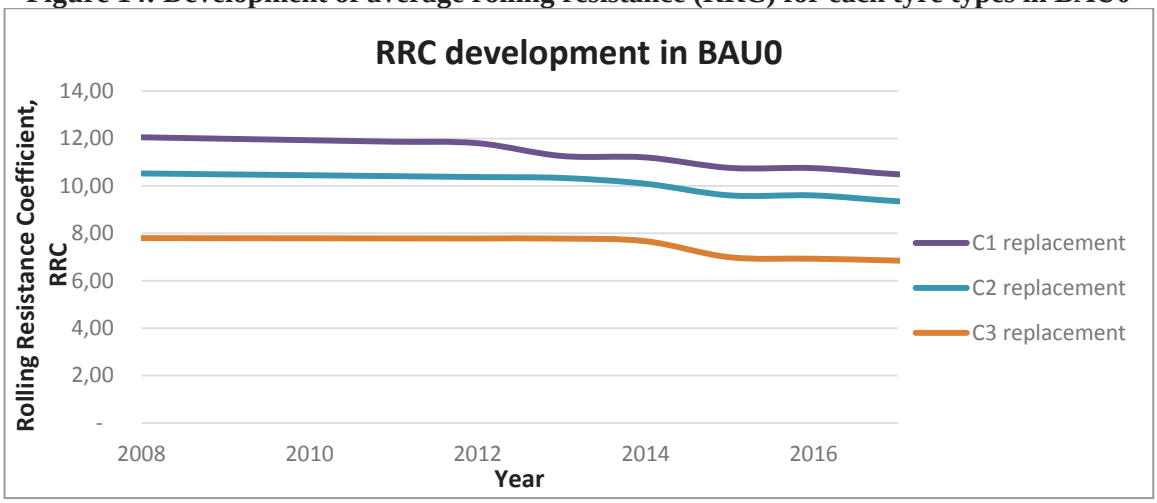
Figure 13: Development of average wet grip (WG) for each tyre type in BAU0



Source: Based on market distribution of WG adopted form the IA 2008 (Appendix 2)

10 http://www.tol-energy.de/ . The TOL database provides the most comprehensive and representative data on tyres sold in the EU, as many importers and manufacturers transport their tyres through Germany, which are then registered in this database. The data therefore provides an indication of the general European tyre market.

Figure 14: Development of average rolling resistance (RRC) for each tyre types in BAU0



Source: Based on market distribution of RRC adopted form the IA 2008 (Appendix 2)

Table 60: External rolling noise levels for all tyre types in BAU0

Tyre type	External rolling noise, dB, 2008	External rolling noise, dB, 2017
C1	71.20	71.05
C2	72.51	72.35
C3	72.00	71.85

Based on the very low rate of development for external rolling noise seen from actual data (i.e. the "Current label scenario" as described in chapter 3) from 2012 to 2017, it is assumed that almost no development would have occurred without the TLR, as the average levels were already below the noise limit values in the GSR. The average external rolling noise levels in the BAU scenario are therefore assumed to change only very little from 2008 to 2017 as seen in Table 60.

3. Implementation / state of Play

The TLR was adopted by the Council and the European Parliament in November 2009 and entered into force on 1 November 2012. Member States had thus three years to implement the necessary market surveillance and enforcement processes.

The TLR provides a framework for the provision of harmonised information on tyre performance and is directly applicable in all Member States. Enforcement is carried out by national market surveillance authorities (**MSAs**) appointed in each Member State in accordance with Regulation (EC) No 765/2008[11]. Interviews conducted with MSAs in various Member States[12] in 2015 showed that the market surveillance effort varies greatly throughout the EU, and in general, the only widespread activity is shop inspections. Technical documentation is rarely requested for market surveillance

11 Regulation (EC) No 765/2008 of the European Parliament and of the Council of 9 July 2008 setting out the requirements for accreditation and market surveillance relating to the marketing of products and repealing Regulation (EEC) No 339/93, OJ L 218, 13.8.2008, p. 30.

12 Belgium, Finland, Germany (3 Länder), Estonia, Malta, Netherlands, Sweden, United Kingdom, Hungary, Poland and Slovakia

purposes and there is a severe lack of market surveillance testing due to a lack of resources and limited number of testing facilities. Furthermore, the few Member States which have conducted tests found that the repeatability and reproducibility of the test results was very low.

The low market surveillance activity decreases end-user confidence in the tyre label. Similarly, tyre dealers reported that due to lack of market surveillance inspections, they decreased their efforts to train their employees in informing end-users of the labelling scheme.

In response to the acknowledged lack of market surveillance and enforcement, the Horizon 2020 funded the MSTyr15 project[13] was launched in April 2016 for a two-year duration. Based on coordinated market surveillance actions by 15 countries[14], the project aims to perform 15,000 tyre inspections (shop inspections), 1,500 document inspections and 150 tyre tests of rolling resistance and wet grip for C1 tyres by May 2018. The results of the efforts are still to be published.

Aside from the enforcement issues, a general low awareness among C1 users was identified in the 2016 consumer survey performed in the context of the 2016 Review Study[15]. Only 41% of the respondents were aware of the tyre label before they responded to the survey, and while more than 70% found the information on fuel efficiency and wet grip easy to understand, less than 60% found the noise information easy to understand. This indicates that for the full potential of the label to be realised both the general awareness of the label's existence and the specific knowledge of the label content would need to be improved.

Despite the issues related to enforcement and awareness of the label, the rolling resistance and wet grip have both improved since the label was first implemented, while the pattern is less consistent for the external rolling noise parameter. The evolution of the three label parameters can be seen in **Figure 16** to **Figure 18** in chapter 5.

4. Method

4.1. SHORT DESCRIPTION OF METHODOLOGY

This evaluation is partially based on the findings from the Review Study carried out in 2016[16] and the subsequent Open Public Consultation (**OPC**)[17], but with market data updated to 2017.

The evaluation calculations are based on a stock model, determining the number of tyres of each type (C1, C2, C3) in the EU, which is shown in the table below. The stock model is built on annual sales provided by the European Tyre and Rubber Manufacturers

13 http://www.mstyr15.eu/index.php/en/

14 Belgium, Bulgaria, Croatia, Estonia, Finland, Germany, Ireland, Latvia, Lithuania, Luxembourg, Poland, Romania, Spain, Sweden and Turkey

15 https://ec.europa.eu/energy/sites/ener/files/documents/Study%20in%20support%20of%20the%20Review%20of%20the%20Tyre%20Labelling%20Regulation_final.pdf

16 http://www.labellingtyres.eu/

17 See Annex 2 of the 2018 Impact Assessment for the results and answers of the Open Public Consultation

Association (**ETRMA**), combined with European Automobile Manufacturers Association (**ACEA**) annual numbers on vehicles in use in EU[18]. The specific data and assumptions are shown in Appendix 2

Table 61: Derived tyre stock in EU-28, from 2008 to 2017

Stock in millions	2008	2010	2012	2014	2016	2017
C1	1 351	1 415	1 398	1 406	1 461	1 499
C2	121	122	123	122	126	130
C3	65	59	57	56	62	67
Total	**1 537**	**1 596**	**1 578**	**1 584**	**1 650**	**1 696**

Source: Stock model, Viegand Maagøe 2018.

The calculated tyre stock gives an average of 5.5 tyres/C1vehicle, 4.1 tyres/C2 vehicle and 12.2 tyres/C3 vehicle. The higher average number of tyres per vehicle for C1 than C2 is assumed to be due to the larger number of users having two sets of tyres for their car (e.g. winter tyres in addition to summer tyres).

The development in rolling resistance, wet grip and external rolling noise with and without the label regulation (i.e. the BAU and the current label scenarios) is used to calculate the effect on fuel efficiency, safety and environmental noise. The specific calculation methods are detailed in Appendix 2.

The fuel efficiency is correlated with the tyre rolling resistance based on the following equation, derived by IDIADA[19] and used in the official "Fuel savings calculator" on the Commission website on tyres[20] (K is a correlation factor determined by testing of tyres):

$$Fuel\ consumption\ change\ (\%) = K * \frac{RRC_{BAU} - RRC_{Label}}{RRC_{BAU}} * 100\%$$

The correlation between wet grip and safety in terms of severity of accidents is much more complex than that of rolling resistance and fuel efficiency. The wet grip is directly correlated to the braking length, which is in turn related to the impact speed in accidents. The correlation is based on data form a study undertaken by TNO in 2014[21] on the potential benefits of Triple-A tyres in the EU. The probability distribution of fatality, severe injury and minor injury varies with impact speed. Hence, a change in wet grip will cause a change in accident severity or even in some avoided accidents. The methodology and underlying calculations are explained in more detail in Appendix 2.

The external rolling noise is important for the environmental noise pollution from road traffic, and the health effects experienced by those exposed to it. The exact correlation between tyre noise and the health effects of environmental noise has not been thoroughly identified. The World Health Organisation (**WHO**) is developing environmental noise

18 http://www.acea.be/statistics/article/Report-Vehicles-in-Use
19 http://www.applusidiada.com/en/
20 https://ec.europa.eu/energy/en/topics/energy-efficiency/energy-efficient-products/tyres
21 TNO, Memorandum to Ministry of Infrastructure and Environment, "Potential benefits of Triple-A tyres in the EU", link:http://www.unece.org/fileadmin/DAM/trans/doc/2014/wp29grb/GRB-60-13e.pdf

guidelines for the EU[22] and reports regarding the noise effects. Studies are ongoing (to be finalised in 2018) and it is possible that a calculation model for quantitatively correlating traffic noise with its health effects will also be developed. At the moment, only a preliminary model is available, which has been used for estimating the health effects.

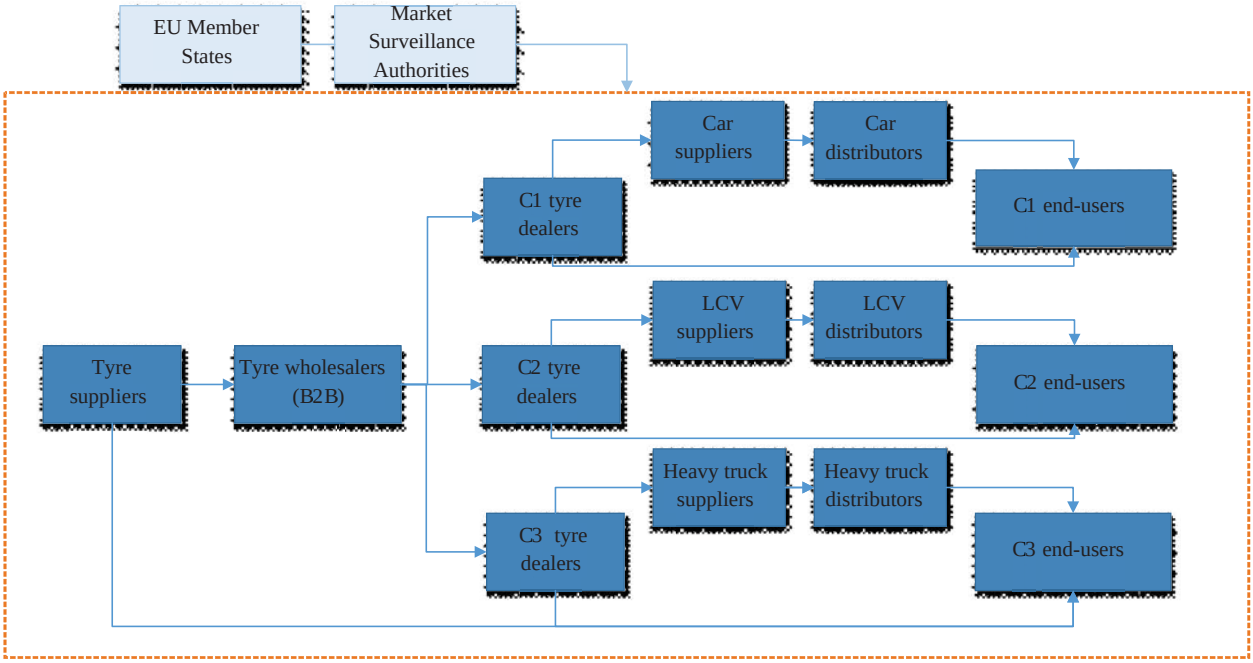
4.2. INTERVIEWS AND END-USER SURVEY

As part of the 2016 Review Study[23], an extensive stakeholder consultation was performed, to assess the efficiency and effectiveness of the label scheme. Stakeholders from across the supply chain (see Figure 15), were approached to assess their role and whether the TLR was serving its intended purpose.

The stakeholder consultation thus included:

- Tyre suppliers;
- Tyre distributors;
- Vehicle suppliers and distributors;
- End-users in each tyre segment: C1, C2 and C3.

Figure 15: Overview of the stakeholder groups directly and indirectly involved in the tyre supply chain of both OEM (Original Equipment Market) and replacement tyre market



Interviews and questionnaires were conducted with organisations in each segment, and a more thorough consumer survey was carried out in the largest end-user segment: private car owners of C1 vehicles. The C1 consumer survey included 6,000 respondents, a thousand from each of the following six Member States:

- Germany (~42 million cars)

22 http://www.euro.who.int/en/health-topics/environment-and-health/noise/activities/development-of-who-environmental-noise-guidelines-for-the-european-region

23 https://ec.europa.eu/energy/sites/ener/files/documents/Study%20in%20support%20of%20the%20Review%20of%20the%20Tyre%20Labelling%20Regulation_final.pdf

- England (~29 million cars)
- France (~32 million cars)
- Italy (~37 million cars)
- Sweden (~4.5 million cars)
- Finland (~3 million cars)

The consumer survey was supplemented with answers from the OPC. More details about the stakeholder consultation are presented in Appendix 1.

4.3. LIMITATIONS AND ROBUSTNESS OF FINDINGS

The major limitation of the findings is the **inability to directly correlate the external rolling noise reported on the label to societal consequences in terms of human health**. It is reasonable to expect that decreasing tyre rolling noise will result in a decreasing number of people exposed to excessive traffic noise. However, the effect in terms of hospitalisations and fatalities cannot be quantified.

Also, the correlation between wet grip and safety (in terms of number of accidents, fatalities and injured in the traffic) relies on several crucial assumptions, such as the likelihood of sustaining various degrees of injury in a traffic accident based on the impact speed (as explained in Appendix 2).

Another important limitation is the lack of available data on non-compliance with the label values; i.e. the number of tyres that do not live up to the declared label values, and how much the actual performance varies from the reported performance for these products. This might result in a larger estimated saving than actually achieved, because the modelling is based on reported label values.

5. Analysis and answers to the evaluation questions

5.1. EFFECTIVENESS

a. Evaluation question 1: what have been the effects of the intervention?

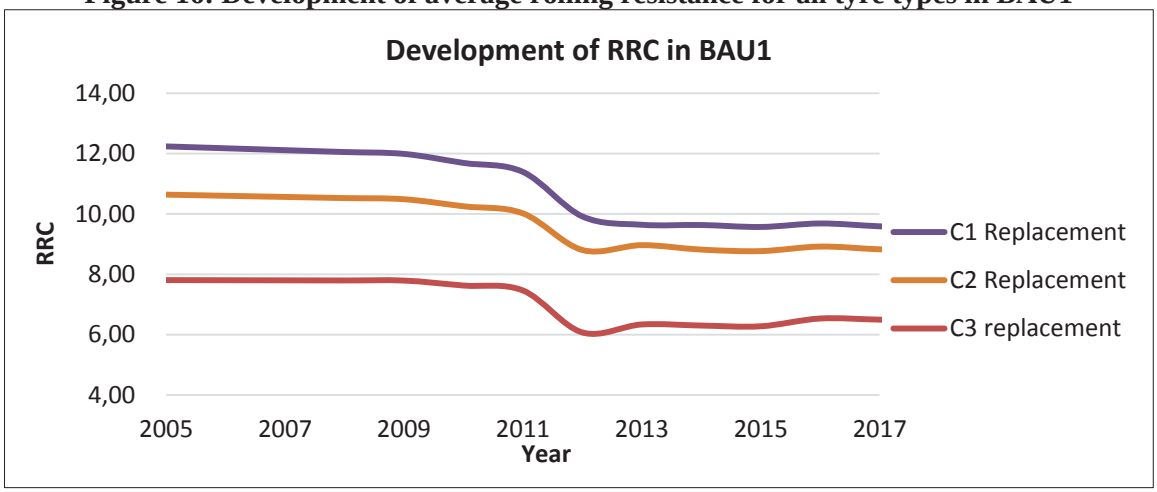
The Review study from 2016 and the results from the OPC show that the objectives of the TLR have been achieved to some extent, but that the effect is reduced due to relatively low consumer awareness, lack of visibility of the label in the purchase situation and weak enforcement resulting in low confidence in the label.

The consumer awareness affects effectiveness of the TLR because it is reliant on affecting consumers' choice when purchasing tyres and with low awareness and confidence, users will be less likely to take the label into account in a purchase situation. The lack of visibility of the label before a purchase decision is taken, is contributing to the low awareness and thus decrease the overall effectiveness of the TLR.

The rolling resistance and wet grip performance of tyres have improved since implementation of the TLR in 2009, as seen from the data in **Figure 16** and **Figure 17**, whereas the effectiveness on noise is questionable (**Figure 18**). As seen in the graphs

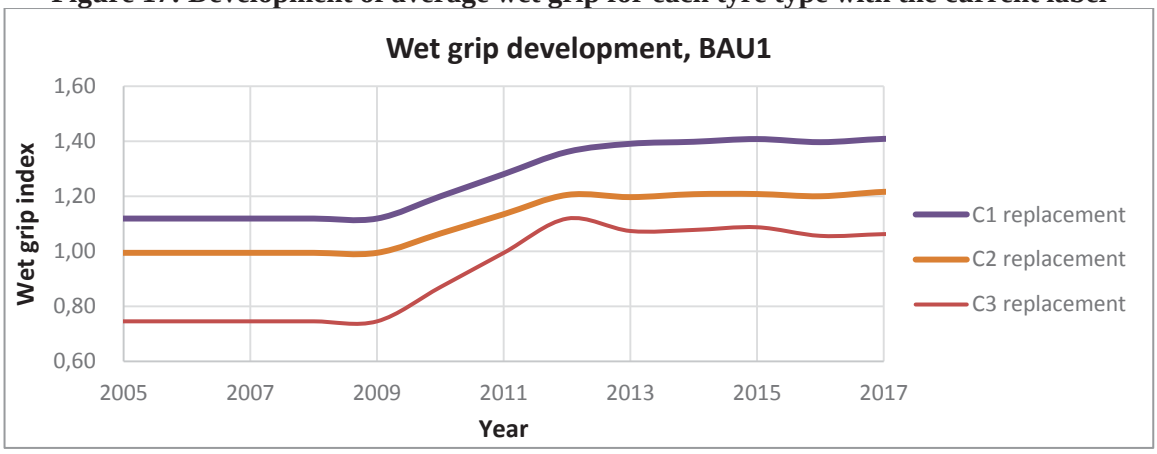
below, the rolling resistance and wet grip improvements of all three tyre types (C1, C2, C3) subside after 2013. For C3 tyres (trucks and busses) there is even an increase in average rolling resistance from 2015 to 2017 and a simultaneous decrease in wet grip.

Figure 16: Development of average rolling resistance for all tyre types in BAU1



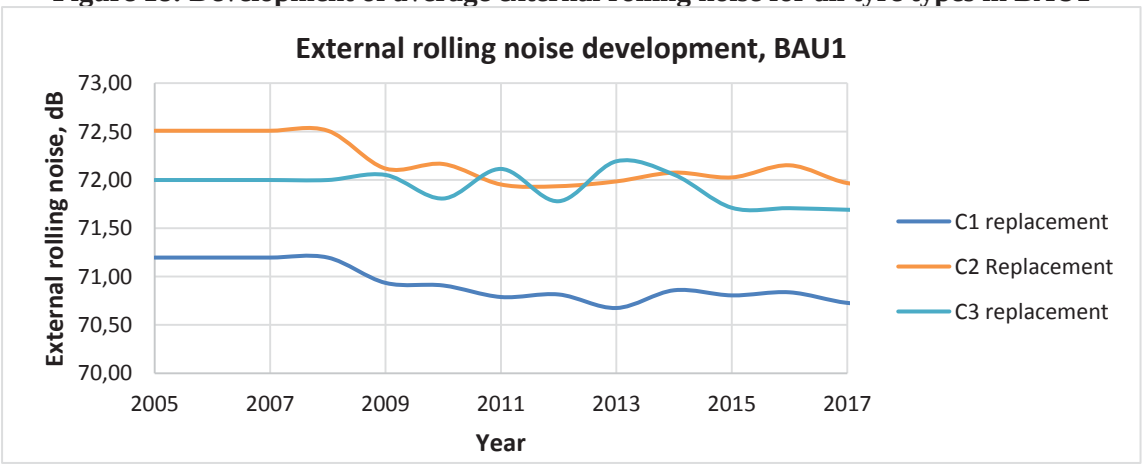
Source: Based on data on market distribution from TOL/GfK (Appendix 2)

Figure 17: Development of average wet grip for each tyre type with the current label



Source: Based on data on market distribution from TOL/GfK (Appendix 2)

Figure 18: Development of average external rolling noise for all tyre types in BAU1



Source: Based on data on market distribution from TOL/GfK

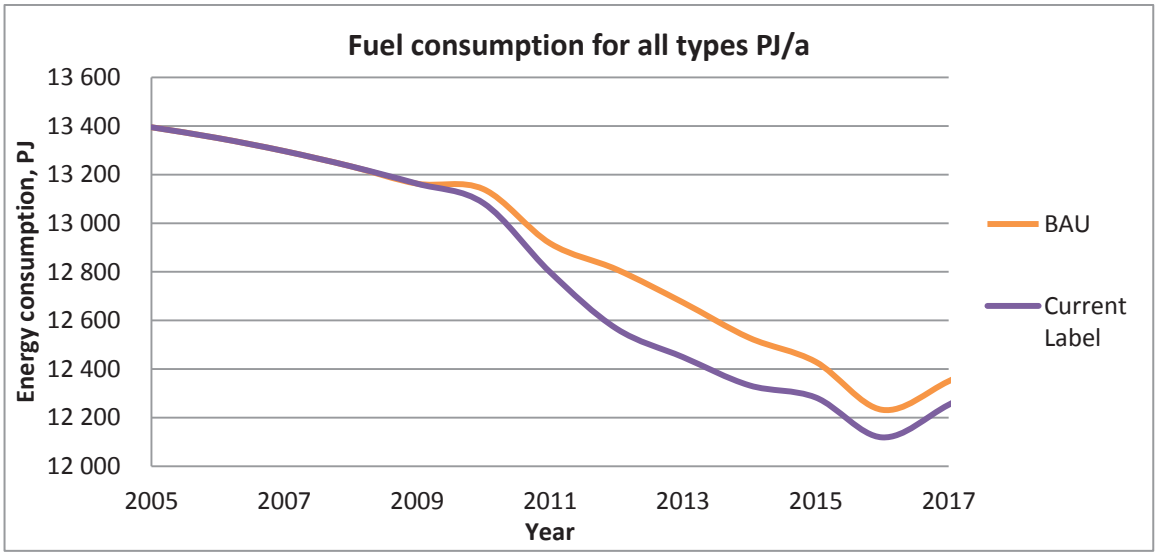
The reverse development for C3 tyres could be due to a variety of reasons, but one is that C3 tyres are often purchased by procurement departments in professional fleets, and that the focus is on purchase price rather than total cost of ownership. Also, the label is not shown for C3 tyres, but only the values are given in the technical promotional material, which could result in lower awareness of the label criteria and their significance. Furthermore, other parameters such as mileage might play a bigger role for C3 fleet operators than for private consumers and C2 users, since the yearly distances driven with C3 vehicles are often much higher.

In general, the C3 tyre market fluctuates more for all three label parameters than the C1 and C2 markets. This variation is most pronounced for the external rolling noise parameter, which does not show the same smooth development as the rolling resistance and the wet grip, but overall still shows a declining tendency for all tyre types.

The decrease in rolling resistance has resulted in cumulative fuel savings of approximately 1200 PJ from 2010 to 2017, corresponding to 170 PJ per year in saved fuel consumption[24]. According to official EU statistics the energy consumption of the road transport sector was around 12,300 PJ in 2015[25]. The annual savings are thus around 1% of road transport fuel consumption.

The difference in total fuel consumption of all vehicle types (C1, C2, C3) in the EU-28 in the BAU and the Current Label Scenario is shown in Figure 19. The saved fuel consumption is directly linked to corresponding avoided greenhouse gas (GHG) emissions of around 88 MT CO_2-eq[26] as well as other pollutant emissions related to road transport.

Figure 19: Development of fuel consumption for all tyre types (C1, C2, C3) in EU-28 from 2005 to 2017 for the BAU and Current Label Scenario



Source: Calculation by external consultants Viegand Maagøe

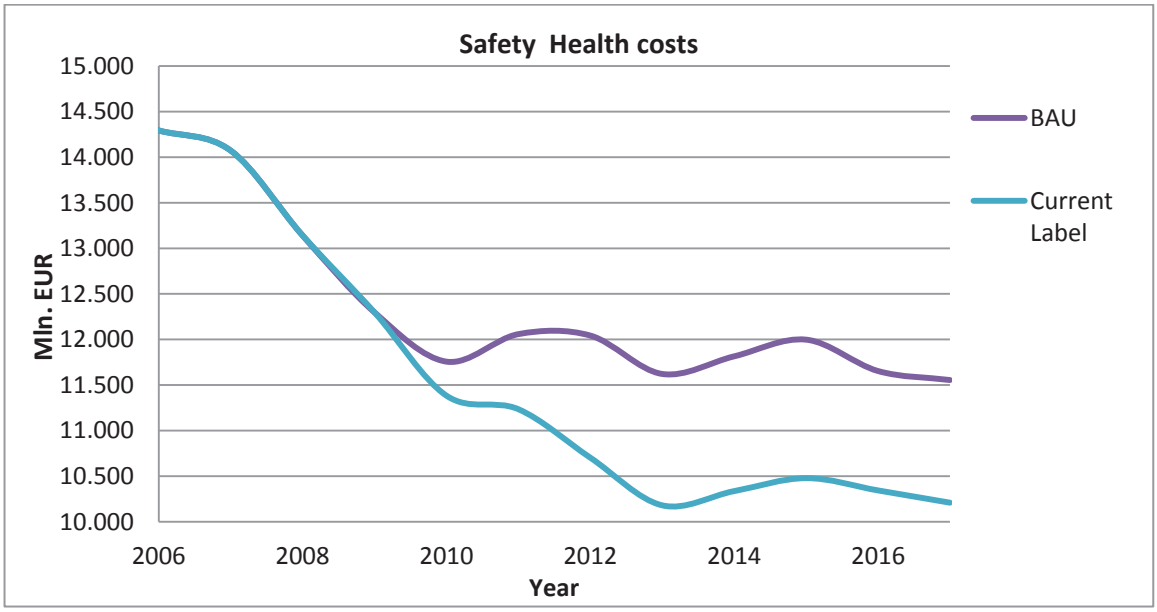
[24] Based on calculations models developed by consultants from Viegand Maagoe

25 EU statistical pocketbook, European Commission, 2017 https://ec.europa.eu/transport/sites/transport/files/pocketbook2017.pdf

[26] Based on calculations models developed by consultants from Viegand Maagoe

Regarding safety, the observed improvement in wet grip performance is estimated to have led to 1,825 avoided fatalities in traffic accidents and 29,640 less people severely injured from 2010 to 2017[27]. At the same time, however, an additional 43,122 people suffered minor injuries because the accidents became less severe (i.e. the accidents with avoided severe injuries instead resulted in minor injuries)[28]. The total societal costs savings of the avoided fatalities and accidents amount to approximately EUR 9,600 million in the entire period the Regulation has been in place, or EUR 1,200 million per year. The development of safety health costs for the BAU and the Current Label Scenario is shown in Figure 20 for the years 2006 to 2017.

Figure 20: Development of safety health costs for all tyre types



Source: Calculation by external consultants Viegand Maagøe

The external rolling noise of tyres is the parameter for which the TLR has been least effective in changing the market. Even though noise levels have decreased slightly for all three tyre types, the decrease is rather tenuous with fluctuating noise levels from year to year, and overall less than 0.5 dB decrease is observed from 2005 to 2017 (See Figure 18). The small effect on external rolling noise compared to the other label parameters, is thought to be because both industry and end-users give noise a lower importance than other parameters[29]. Furthermore, the rolling noise pictogram is the label parameter that end-users find most difficult to understand according to both the consumer survey from the 2016 Review Study and the OPC responses.

Nevertheless, overall external rolling noise has decreased slightly, which might have led to an unquantifiable number of people experiencing less severe noise nuisance from road traffic. Road and traffic noise is causing health effects such as sleep deprivation,

27 Based on calculations models developed by consultants from Viegand Maagoe
28 Based on calculations models developed by consultants from Viegand Maagoe
29 According to the consumer survey made in relation to the 2016 review study, 34% found fuel efficiency very important, 62% found wet grip very important and only 21% found external rolling noise very important. Industry declared during the review study that the focus was first on developing tyres with good wet grip and rolling resistance, and noise had lower priority.

increased stress and ultimately hospitalisation or death due to coronary heart disease and cerebrovascular disease. A report from 2014[30] estimated that traffic noise above 55 dB caused around 8,900 deaths and 38,150 hospitalisations per year.

Since the external rolling noise remains above 70 dB on average, and the actual noise nuisance experienced depends on several factors not affected by the tyre itself (e.g. distance to the road, noise barriers, pavement type and speed limits), it is not possible to quantify the actual change in number of people affected by road noise due to the TLR.

Even though the TLR has resulted in savings of about 1% annual fuel consumption, more than 90% of tyres sold are still in fuel efficiency class C to F, and only 6-8% are in class A or B. A potential thus exists for further energy savings, which can be obtained without compromising road safety (wet grip), since tyres with fuel efficiency and wet grip performance class combinations "AA" or "AB/BA" are already on the market. However, the energy savings obtained through the labelling scheme is being somewhat counteracted by a trend towards larger tyres (due to deliberate consumer choice), which tends to increase absolute fuel consumption, even though these tyres are more fuel efficient than earlier models of that size[31].

The effectiveness of the scheme is reduced by the low degree of enforcement and market surveillance, which prevents the full savings potential to be realised. This has been assumed to cause relatively high non-compliance rates[32] of the recorded label values for tyres sold in the EU. One of the barriers for market surveillance reported by some MSAs[33] and by the PROSAFE MSTyr15 project is the problems experienced when trying to obtain technical documentation. According to these sources it is sometimes difficult and time consuming to identify the party responsible for providing the information, and then to receive the complete information. Furthermore, the uncertainty of the test methods leads to low reproducibility of test results, making it difficult for MSAs to prove non-compliance in the cases when they find it by testing. An MSA interviewed for the 2016 Review Study stated that the same tyre tested on two different tracks could vary up to 3 label classes on the wet grip scale in some cases.

b. Evaluation question 2: To what extent do the observed effects link to the intervention?

The observed market change in especially RRC and WG is likely to be largely linked to the TLR. It is possible that the effects are in part due to other factors such as general innovation and market trends towards more fuel efficient tyres, independent of the TLR. However, as seen from the graphs (Figures 5 to 8), there was only very minor development in the label parameters before the regulation was adopted in 2009.

[30] http://www.rivm.nl/en/Documents_and_publications/Scientific/Reports/2014/december/Health_implication_of_road_railway_and_aircraft_noise_in_the_European_Union_Provisional_results_based_on_the_2nd_round_of_noise_mapping

[31] According to industry members consulted during the Review Study, 2016

[32] In the Current Label value, a 15% non-compliance rate is assumed with the average non-compliance magnitude of 2 classes lower than recorded on the label, based on preliminary results from the PROSAFE MSTyr15 project..

[33] In interviews conducted in relation to the 2016 Review Study

A report in the TLR's impact on innovation from 2014[34] found that the label had a positive impact on the innovation activities in the tyre supply chain. Not only tyre manufacturers, but also rubber and plant manufacturers were affected positively, since the improvement of the label parameters are heavily reliant on rubber compounds and new compounds require the development and adaption of machinery. According to the innovation study, manufacturers stated that innovation activities started around four years before the legislation came into place, which is also seen by the development in the label parameters (Figure 16 to Figure 18).

According to the innovation study, the work towards more efficient tyres was initiated before the TLR was implemented, but the label provided a "strong additional impulse" in innovation[35]. Furthermore, the "background" improvement is also included in the BAU scenario of this evaluation, thus taking into account the expected performance development without any intervention. The first tyre with class A for rolling resistance and for wet grip (so-called AA tyre) was presented in the spring 2012, but due to changes in production lines, it was not marketed before January 2015, which was the first year AA tyres became available on the market[36].

Another intervention influencing the tyre performance parameters on the label is the GSR, setting minimum efficiency requirements for the performance parameters on the label. However, the effect of the GSR is taken into account in the BAU scenario and therefore the difference between the BAU and the current label scenario can be assumed to be very closely linked to the TLR. Furthermore, the GSR does not set minimum requirements on wet grip for C2 and C3 tyres, and the development of WG for these tyre types can therefore not be linked to the GSR.

c. Evaluation question 3: To what extent can these changes/effects be credited to the intervention?

Some of the observed effects already took place in the years before the regulation was adopted. However, the observed effect (difference between BAU and Current Label Scenario) is still linked to the TLR because the manufacturers adapted to the foreseen Regulation (from 2009) even before it entered into force (in 2012), as mentioned earlier.

It should be noted that the average label values before 2012 are not based on actual data, but on estimates from the 2008 Impact Assessment (which were based on expert statements)[37]. The development before 2012 is thus more uncertain than the effect seen after 2012. However, it is expected that most of these changes were a response to the

[34] Ecofys, Impact of Ecodesign and Energy/Tyre Labelling on R&D and technological innovation, https://www.ecofys.com/files/files/fraunhofer-ecofys-2014-impact-of-ecodesign-energy-labelling-on-innovation.pdf

[35] Ecofys, Impact of Ecodesign and Energy/Tyre Labelling on R&D and technological innovation, https://www.ecofys.com/files/files/fraunhofer-ecofys-2014-impact-of-ecodesign-energy-labelling-on-innovation.pdf

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[36] http://news.cision.com/goodyear-dunlop-uk-newsroom/r/goodyear-achieves-top-ratings-in-tyre-labelling-with-introduction-of-eight-aa-tyre-sizes,c9716749

[37] https://circabc.europa.eu/sd/a/99ffc67c-4422-4a38-9995-e41e3a40c333/Technical%20Study%20on%20Possible%20Energy%20Labelling%20of%20Tyres.pdf

GSR, whereas the effects of the TLR are more pronounced after 2012, when consumers were first presented with the label in purchase situations.

d. Evaluation question 4: To what extent can factors influencing the observed achievements be linked to the EU intervention?

Even though the TLR as a whole has been effective in increasing fuel efficiency level, it has been less effective for C3 tyres than for C1 and C2 tyres, primarily due to the way C3 are purchased compared to C1 and C2 tyres. This is not related to the intervention itself but rather to the market structure of the C3 market.

For larger fleets, procurement departments are often responsible for the purchases, and they are typically less focused on fuel efficiency than on purchase price and mileage (which influences the frequency with which new tyres have to be purchased). Furthermore, some C3 tyres are sold through service schemes, which resemble a leasing solution, where the tyre supplier does not bear the fuel costs and therefore does not attach a high importance to fuel efficiency. Combined with purchase cost focused procurement departments, the label information might thus receive little attention in purchase decisions.

Several other factors have reduced the achievements of the TLR, including low consumer awareness, lack of visibility of the label in purchase situations, weak enforcement and inaccurate test procedures.

Some of these factors are linked to the intervention itself while other factors are linked to the national implementation or non-compliance of market actors.

Factors linked to the TLR itself include the lack of a requirement to show the label when tyres are offered for sale on the internet and that labelling is not always required for OEM tyres, which influences the visibility of the label and thus consumer awareness. Furthermore, the TLR itself affects the enforcement based on the facts that:

- the label values are based on self-declaration by the manufactures;
- the defined calculation methods for establishment of the wet grip performance cause uncertainties;
- no detailed explanation of the content of technical documentation is required.

These factors are all linked to the TLR itself and can thus be improved by changing the regulation. Regarding visibility of the label during internet sales, 12% of C1 end-users purchased their last set of tyres online, with 56% planning to buy tyres on the internet in the future[38]. According to input to the OPC from Deutsche Umwelthilfe e.V. it is important that consumers who buy tyres from on-line shops are provided with complete information and that this requires in particular an image of the label, which due to its recognition value, enables comparisons.

38 Review study on the Regulation (EC) No 1222/2009 on the labelling of tyres. March 2016. Consumer survey among 6000 car owners in Germany, England, France, Italy, Sweden and Finland (1000 per country)

In the OPC nearly 60% of the 70 respondents answered that they would be more confident in the label's information if third party verification were mandatory and nearly the same percentage is of the opinion that third party verification should be a requirement[39].

In addition, several stakeholders mentioned independent testing as a means to guarantee the credibility of the label (FOEN[40]) and to make a positive contribution to the confidence in the label (Verband der TÜV e.v.). However, industry (ETRMA and Goodyear) does not support the introduction of third party testing because they see no benefits compared to improving market surveillance efforts and that it might be disproportionate to the available infrastructure of testing institutes/type approval authorities' laboratories.

e. Conclusion on effectiveness of the TLR

So far, the tyre labelling scheme has shown its effectiveness by being able to **transform the market in a positive direction from 2012 to 2017 for the rolling resistance and wet grip** parameters. **For external rolling noise the label cannot be said to have been effective** as it is not possible to unambiguously relate the effect solely to the TLR.

Since only one other intervention (the GSR) affects the tyre performance parameters included in the label, and the effect of this intervention is taken into account in the BAU scenario, **the effects on rolling resistance and wet grip can be attributed directly to the TLR**. However, due to the low label awareness among consumers, the effect is not as great as it would have been with higher awareness. In the consumer survey from the 2016 Review Study, 90% of respondents found the label information "useful" or "very useful", but only 41% stated that they knew the label before the questionnaire. This indicates that the label would be more effective if the awareness was higher.

The effectiveness of the scheme is reduced due to relatively low consumer awareness, consumer preferences, weak enforcement and inaccurate test procedures, especially for the wet grip tests which can give 3-4 classes of difference when tested at different tracks. This was highlighted by MSAs interviewed for the 2016 Review Study[41] as a problem for enforcement and a potential for improvement.

Consumer awareness and confidence in the label is particularly important since the TLR does not require manufacturers to produce tyres with higher performance, but this is rather a result of increased end-user demand for such tyres. Hence, if user **awareness or confidence in the label is low, tyres with high performance according to the label parameters will not have a market advantage**, but rather the opposite since they are often sold at higher prices. Visibility of the label is therefore important especially in the case of tyres sold online and for OEM tyres.

39 36% support third-party verification for every tyre model, 22% for representative sample of tyres
40 Federal Office for the Environment, https://www.bafu.admin.ch/bafu/en/home.html
41https://ec.europa.eu/energy/sites/ener/files/documents/Study%20in%20support%20of%20the%20Review%20of%20the%20Tyre%20Labelling%20Regulation_final.pdf

5.2. EFFICIENCY

a. Evaluation question 1: To what extent has the intervention been cost-effective?

While the costs of labelling will fall on manufacturers in the first place, they will pass on any extra costs to end-users who will benefit from cost savings linked to the performance of the products that outweigh the upfront costs[42].

Increased tyre performance has resulted in increased purchase prices for end-users, but this is offset by lower fuel consumption, which results in greater cost savings over the tyre lifetime. The total costs of ownership (TCO)[43] over the life time of tyres are lower with the implementation of the label than without, for both C1/C2 and C3 tyres. On average, tyre labelling is estimated to have saved C1 end-users an average of 60 Euro/year, C2 end-users an average of 118 Euro/year and C3 end-users an average of 673 Euro/year[44] from 2010 to 2017.

However, for C3 tyres the TOC improvements seen in the Current Label Scenario went down in 2016 and 2017, as seen in **Figure 21** below. The reduction in benefits occurs because of the second stage of rolling resistance requirements in the GSR, which causes the rolling resistance levels to decrease in the BAU scenario, which thus "catches up" with the development otherwise experienced in the current label scenario. This indicates that even though the TLR was cost efficient for end-users in the years 2010-2015, it gives no further savings in 2016 and 2017, when the market is pushed by the GSR towards higher fuel efficiency.

The reasons why the TLR is less efficient for C3 tyres than C1 and C2 tyres are linked to the way C3 tyres are purchased as explained in section 5.1.4. As a result, for C3 tyres the TLR does not achieve better rolling resistance levels than the BAU scenario (after the second stage of the GSR), and thus it is not more cost efficient.

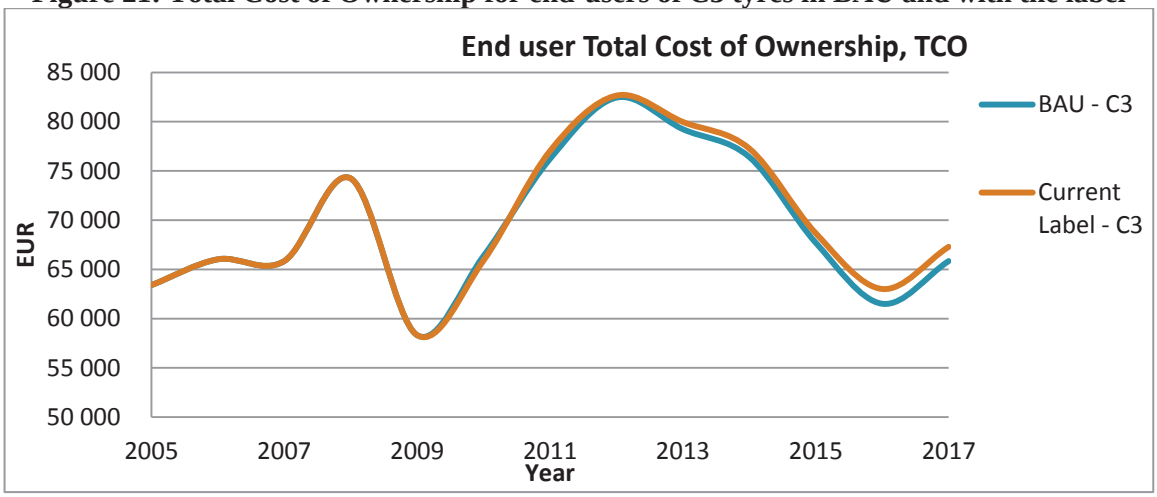
It is however important to note that even though the TOC for C3 end-users does not improve compared to the BAU scenario in the years 2016 and 2017, improvement *was* seen in the years 2010 to 2015. Furthermore, although the effect of the improved wet grip performance for C3 tyres is not included in the TOC calculation (as there isn't a directly derived cost effect), end-users still benefit in terms of less severe and fewer accidents.

42 Evaluation of the Energy Labelling and Ecodesign Directives SWD(2015) 143 final

43 The total costs of ownership include the purchase price of the tyre and the costs for fuel in the life time of the tyre.

44 Based on calculation models developed by consultants at Viegand Maagøe. The figures are in total direct savings (fuel savings minus purchase price), in TCO (Total Cost of Ownership) of a full set of tyres (4 for C1 and C2, 10 for C3).

Figure 21: Total Cost of Ownership for end-users of C3 tyres in BAU and with the label

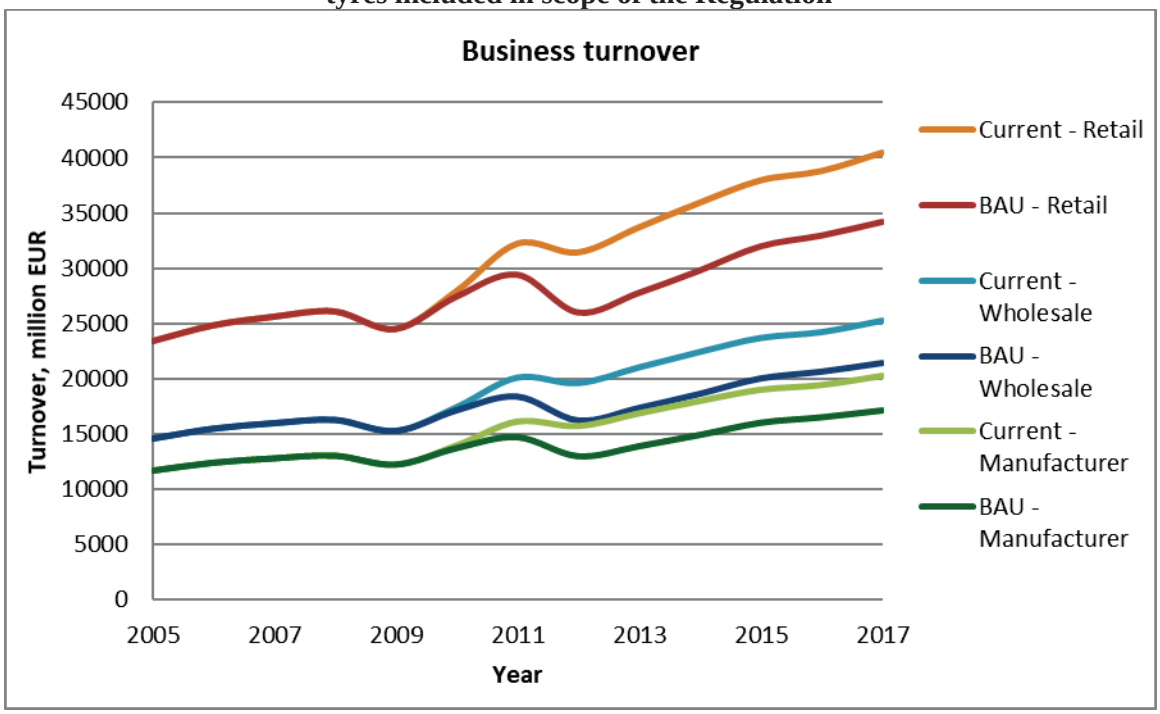


Source: based on unit prices from GfK and sales for ETRMA

Since the introduction of the TLR both tyre performance and purchase prices of tyres have increased. According to ETRMA[45] the TLR has encouraged manufactures to upgrade their products in the context of increased competition on the European market. However, no data is available to make a conclusive connection between increased sale prices and increased costs for development and production of improved tyres.

Based on product prices from GfK the annual retailer turnover has been calculated and mark-up factors have been used to estimate the corresponding turnover for wholesalers and manufacturers (see Appendix 2), which is seen in **Figure 22**below.

Figure 22: Turnover for tyre manufacturers, wholesalers and retailers in EU-28 for the tyres included in scope of the Regulation



Source: unit sales prices from GfK combined with sales data

45 ETRMA input to Inception Impact Assessment

It is important to bear in mind that although the label is mandatory there is no obligation for manufacturers to improve the performance of the product. Experiences from the EU energy labelling of energy-related products show strong evidence that manufacturers have reacted positively to the EU energy labelling scheme and consider the label as an important instrument to differentiate their products. This also suggests that the extra investments needed to achieve higher efficiency levels have generally been outweighed by the benefits[46].

As the labelling is based on self-declaration, no excessive testing costs are put on the manufacturers. The current test costs depend on the tyre type, but can be estimated for all three label parameters[47]:

- 3,500-4,000 Euro for C1 tyres
- 4,000-4,500 Euro for C2 tyres
- 5,000-6,000 Euro for C3 tyres

For each model family with up to 10 different tyre sizes, at least one test needs to be performed. It is not possible to estimate the total testing costs for manufacturers because no data of the actual number of tyres sold of each model are available. However, as mentioned above manufacturers have so far been able to pass most of the additional costs for testing in relation to the tyre labelling on to end-users. According to a 2014 study[48] manufacturers stated that the TLR provided a tool for differentiating their products, making it easier to achieve a return on investment in innovation, because it provided information on an otherwise low-interest product.

In the 2008 Impact Assessment[49], test costs of around 2,300 Euro were estimated for wet grip grading alone, with a need for 1,100 tests per year. No data estimates were given for the other label parameters. Since the TLR includes not only wet grip, but also rolling resistance and external rolling noise, the actual test costs mentioned above are higher than estimated in 2008. The number of tests depends on the number of different tyre models placed on the market each year, and with around 4,000 new models per year[50] around 1,000 individual tests seems reasonable. It can therefore be assumed that the wet grip testing costs estimated in the 2008 Impact Assessment have been materialised, with the addition of the cost for rolling resistance and external rolling noise.

Distributors and dealers must ensure that C1 and C2 tyres bear the label at the point of sale and they will have to cover the administrative costs for this activity. Although no quantitative data is available, costs for dealers to show the label on displayed products is widely accepted within the framework of the EU energy labelling scheme for energy-related products. In addition, the dealers will benefit from higher turnover due to

46 Ecofys, Evaluation of the Energy Labelling Directive and specific aspects of the Ecodesign Directive, June 2014.
47 Source: Information from ETRMA
48 https://www.ecofys.com/files/files/fraunhofer-ecofys-2014-impact-of-ecodesign-energy-labelling-on-innovation.pdf page 25
49 http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52008SC2860&from=EN –table 16 on page 51.
50 Based on estimates from data purchased from TOL https://www.bloomberg.com/research/stocks/private/snapshot.asp?privcapId=257341008

increased sales of better performing and more expensive tyres[51]. In the 2008 Impact Assessment[52] it was estimated that it would cost 0.04 Euro/tyre to print and add a label as a sticker on the tyre tread, amounting to around 10 million Euro per year in total (for C1 and C2 tyres). In more recent studies, e.g. the Impact Assessment on Energy Label Framework Regulation[53], a price 0.3 Euro/sticker was estimated.

Member States need to bear the costs for market surveillance, but they will also benefit from the reduction of accidents and health problems resulting from tyre labelling. In addition, EU wide legislation will be more cost effective from a Member State perspective compared to national legislation, because the costs of developing the regulation, test methods and conducting pre-regulatory studies are shared instead of conducted for each country separately.

The costs for market surveillance vary between Member States. Some carrying out almost no activities while others undertake both shop inspections and testing. No data regarding Member States costs for market surveillance is available.

Via the MSTyr15[54] project, the Commission supportscoordination and improvement of tyre market surveillance on the European market. The overall objective of the project is to help deliver the intended economic and environment benefits of the labelling of class C1 (passenger car) tyres. This will be achieved by improving the effectiveness of the MSAs through training and the adoption of good practice guidelines. The budget for the project is EUR 1.85 million [55].

b. Evaluation question 2: To what extent are the costs of the intervention justified, given the changes/effects it has achieved?

The TLR has resulted in substantial savings for end-users and society, without excessive costs for manufacturers, other market actors or Member States. In total 1,200 PJ, corresponding to 88 MT CO_2 emissions, have been avoided from 2010 to 2017, benefiting the society as a whole. Furthermore, in the same period an estimated 1,825 fatalities and 29,640 severe injuries were avoided in traffic due to higher performing tyres.

Manufacturers have been able to pass on the extra cost for development of better performing tyres to end-uses, and distributors and dealers benefitted from increased turnover.

Member States need to bear costs for market surveillance, but they will also benefit from the reduction of accidents and health problems achieved due to the tyre labelling. In addition, an EU wide legislation will be more cost effective from a Member State perspective compared to national legislation.

[51] Stoock model numbers presented in Appendix 3 indicate a continuous increase in overall sales
[52] http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52008SC2860&from=EN – Table 17 on page 52
[53] http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52015SC0139&from=EN - Annex 9, page 114
54 http://www.prosafe.org/horizon-2020-projects/mstyr15/72-joint-actions/mstyr15
55 https://cordis.europa.eu/project/rcn/200156_en.html

Therefore, the intervention costs seem justified given the improved performance of tyres and the associated benefits.

c. Evaluation question 3: To what extent are the costs associated with the intervention proportionate to the benefits it has generated? What factors are influencing any particular discrepancies? How do these factors link to the intervention?

Due to the benefits illustrated above and the low costs for implementation of labelling compared to other actions, the intervention is considered proportionate. The fact that the same tests can be used to prove compliance with the GSR to document the label values makes both regulations more cost efficient for manufacturers.
One important factor influencing the discrepancy observed for C3 tyres is their purchase pattern, which often involves procurement departments primarily focused on purchase costs or leasing solutions in which different actors carry the burden for the purchase cost (the tyre supplier) and the fuel cost (the end-user). This is a market factor (i.e. a split incentive) that cannot be linked to the intervention itself but to the supply chain.

d. Evaluation question 4: To what extent do the factors linked to the intervention influence the efficiency with which the observed achievements were attained? what other factors influence the costs and benefits?

Since the efficiency to some extent depends on the effectiveness of the scheme, some of the same factors influence the efficiency. This is especially true for consumer awareness, since the label does not require manufacturers to produce tyres with higher performance, but this is rather a result of end-user demand for such tyres. Hence, if end-user awareness or confidence in the label is low, tyres with high performance according to the label parameters will not have a market advantage, but rather the opposite since they are often also sold at higher prices.

Consumer awareness and label confidence are in turn linked to the enforcement and market surveillance actions of the Member States, and to improve awareness and confidence, market surveillance activities should also be strengthened.

Other factors affecting the costs and benefits of the Tyre Label Scheme is the general tendency towards more fuel-efficient cars. Since the tyre rolling resistance accounts for a certain percentage of the car fuel consumption, cars with higher fuel efficiency subsequently also give the end-user lower absolute savings from the tyres. This should however not be seen as a negative effect, since the reduced fuel consumption of the car itself is a means to the same end of mitigating GHG emissions.

e. Evaluation Question 5: How proportionate were the costs of the intervention borne by different stakeholder groups taking into account the distribution of the associated costs?

Tyre manufacturers bear the largest share of the costs, but they have so far been able to pass the extra costs on to the end-users, without increasing the total costs for end-users over the life time of the tyres.

The end-users bear the costs for more expensive tyres, but they will be compensated by saved fuels costs over the lifetime of the tyres.

Member States bear the costs for market surveillance in general and tyres only form one small part of that. Moreover, the Commission has supported market surveillance through the MSTyr15 project.

For this intervention it is important to bear in mind that it is voluntary for manufacturers to improve the performance of tyres and for the end-users to buy better performing tyres. The mandatory part for the manufacturer is the provision of the label information and the label itself (for C1 and C2 tyres).

f. Evaluation question 6: Are there opportunities to simplify the legislation or reduce unnecessary regulatory costs without undermining the intended objectives of the intervention?

The one opportunity for simplification and reduction of regulatory costs that has been identified is the establishment of a product registration database in line with database introduced in the energy labelling framework regulation (EU) 2017/1369. According to MSAs interviewed in correlation with the 2016 Review Study and the PROSAFE MSTyr15 project, obtaining technical documentation is difficult and a database would help them in their work, making market surveillance easier.

The idea is that the tyre supplier will be obliged to register all new models and enter pre-defined information in the database before placing the tyre on the market. The information will include details about the supplier and the product, for instance suppliers name and trademark, model identifier, performance classes and other parameters on the label, the label in electronic format and the technical documentation.

As tyre suppliers are already obliged to assemble all the required documents and information (including providing the label) and make the information available to authorities on request, the additional costs for uploading the documentation in a database is limited. The additional costs could be compensated by the fact that manufacturers do not need to handle requests from authorities because these already have easy access to the information in the database.

The burden for Member States' MSAs to obtain the documentation is significantly reduced. Also, the burden for suppliers and dealers will be reduced because they have easier access to the label and the label information.

As the Commission is already obliged to set up the database for energy-related products, the extra costs for inclusion of tyres will be marginal. Establishment of a product registration database is supported by end-users, manufacturers and Member States.

g. Evaluation question 7: if there are significant differences in costs (or benefits) between Member States, what is causing them? How do these differences link to the intervention?

Member State costs associated with the tyre labelling Regulation are primarily related to market surveillance.

Even though all Member States have the same the obligation to perform market surveillance according to the Regulation, the actual level of market surveillance varies greatly between Member States - from zero to several hundred shop inspections per year. The prevailing type of market surveillance is 'point of sales' inspections. Some authorities performed inspections of technical documentation, but only very few performed laboratory tests to verify the label values. According to MSAs, high cost and too few accredited test facilities are the greatest barriers for laboratory testing of tyres.[56]

The relatively low level of market surveillance affects consumer confidence negatively, and many stakeholders[57] state in both the Review Study and the OPC that to increase confidence more market surveillance (including testing) and sanctioning of non-compliance is needed. Furthermore, retailers claim in the Review Study and the OPC that they 'not often' or 'never' experience that their shops are inspected, which has given them the impression that tyre labelling is of low priority for the authorities.

Based on this, some tyre dealer organisations have decreased their effort to educate their employees in advising consumers about the label parameters. The involvement of dealers is considered of great importance for consumer awareness and the actual use of the label.

h. Evaluation question 8: How timely and efficient is the intervention's process for reporting and monitoring?

Pursuant to the TLR, the Commission must assess the need to review the Regulation and present the result of this assessment to the European Parliament and the Council no later than 1 March 2016.

The TLR was adopted in November 2009 and entered into force in November 2012.

Pursuant to Article 14 of the TLR, the assessment should consider, *inter alia*:

> (a) the effectiveness of the label in terms of end-user awareness, in particular whether the provisions of Article 4(1)(b) are as effective as those of Article 4(1)(a) in contributing to the objectives of this Regulation;
>
> (b) whether the labelling scheme should be extended to include retreaded tyres;
>
> (c) whether new tyre parameters, such as mileage, should be introduced;

56 Review study on the Regulation (EC) No 1222/2009 on the labelling of tyres. March 2016
57 Both the industry and end users have expressed the need for more market surveillance in the context of the 2016 Review Study and in the OPC.

(d) the information on tyre parameters provided by vehicle suppliers and distributors to end-users.

Monitoring the effect of the regulation 6 years after its adoption and around 3 years after it entered into force seems to be appropriate. The Regulation needs to have been in place for some time before it is possible to evaluate its functioning and effectiveness. The list of issues that should be considered has been expanded to include also essential aspects regarding cost effectiveness and the possibility of the label to be able to pull the tyre market towards better performing tyres.

There is no collective data collection or monitoring procedure to evaluate the level of compliance and enforcement/market surveillance activities. This means that progress in the market can only be estimated by purchasing data from market research companies or the like, and not through data collected directly form Members States or suppliers.

i. Conclusions on efficiency of the TLR

The evaluation assessment has shown that **the benefits from the TLR seem to outweigh its costs, both for business and for society as a whole**. This is true both for manufacturers' costs for testing and for end-users. The fact that manufacturers have worked to improve their products shows that the TLR has been used as a product-differentiating factor, which suggests that the extra investment needed to achieve higher efficiency levels has generally been outweighed by the benefits[58].

The increased performance has resulted in increased purchase prices for end-users, but this is offset by the fuel savings, which results in larger savings over the tyre lifetime. All in all, **the total cost of ownership for end-users is lower with implementation of the TLR than without** for C1, C2 and C3 tyres. However, for C3 tyres the TOC improvements seen in the Current Label Scenario subsided in 2016 and 2017.

Member State costs associated with the TLR are primarily related to market surveillance. These costs should be reduced, to incentivise market surveillance in all Member States at a sufficient level. The cost could be reduced by establishing a product registration database in line with the database introduced in the energy labelling framework regulation (EU) 2017/1369 and by specifying better the content of the technical documentation.

5.3. RELEVANCE

a. Evaluation question 1: To what extent is the intervention still relevant?

The objective of the TLR is to provide end-users with information on tyre performance parameters thereby allowing them to make an informed choice, and to influence their purchase decisions in favour of more fuel efficient, safer, and quieter tyres. Furthermore, it incentivises manufacturers to optimise those tyre parameters, paving the way for more sustainable consumption and production.

58 Ecofys, Evaluation of the Energy Labelling Directive and specific aspects of the Ecodesign Directive, June 2014.

These objectives are still relevant since increasing fuel efficiency continues to be important with the EU facing a dependence on energy imports and with the need to limit climate change. Decarbonising the transport sector is a major challenge and it is the only large EU sector where emissions today are above their 1990 levels. Tyres account for 5-10% of vehicle fuel consumption due to their rolling resistance[59]. Decreasing rolling resistance of tyres is therefore important to increase fuel efficiency and cut greenhouse gas emissions.

Ensuring that consumers are informed about the rolling resistance (and thus the impact on fuel consumption) of different types of tyres is a crucial element in driving changes in behaviour and moving the market towards greater fuel efficiency. At the same time, the label helps end-users choose safer tyres through the wet grip performance indicator and quieter tyres through the external rolling noise indicator. The more effective the label, the greater the contribution to achieving clean, safe and quiet vehicles.

Increasing road safety is highly relevant with approximately 24,500 road accident fatalities in the EU in 2017[60]. The Commission has adopted a road safety programme[61] to decrease road deaths between 2011 and 2020. Tyres are an important part of road safety as they are the only contact between the vehicle and the road. Providing end-users with information on tyre safety parameters is highly relevant as well, with the tyre safety parameter wet grip being a top-level concern for end-users along with price when purchasing tyres. furthermore the 2016 Review Study indicated that considering including additional safety performance parameters such as tyre grip on snow and ice in addition to the wet grip parameter may contribute to increasing relevance. Snow and ice performance were also rated as relevant by end-users in the consumer survey conducted in relation to the 2016 Review Study.

Regulating external rolling noise levels also continues to be highly relevant. The Environmental Noise Directive (END) 2002/49/EC entered into force in 2002 and obliges Member States to report noise levels. The data collected shows that in 2013 70 million people in Europe suffered from unacceptable noise levels in so-called Black Areas, exceeding 65 dB noise levels, and even more in Grey Areas with noise levels between 55 and 65 dB. The WHO recommends night noise levels below 40 dB to protect public health. Regulating external rolling noise of tyres thus remains important to mitigate this problem.

According to the results of the OPC, a clear majority of the respondents (nearly 80%) find the tyre label helpful when deciding which tyres to buy. The respondents that find the label useful include manufacturers (ETRMA), national authorities and NGOs. In the consumer survey carried out as part of the 2016 Review Study, 90% of the interviewed car owners (cars with C1 tyres) rated the label as useful (including 38% as very useful).

[59] Numbers are for highway driving, https://www.fueleconomy.gov/feg/atv.shtml. City driving results in 3-5% rolling resistance loss.
[60] https://ec.europa.eu/transport/road_safety/specialist/statistics_en#
[61] http://europa.eu/rapid/press-release_MEMO-10-343_en.htm

b. Evaluation question 2: To what extent have the (original) objectives proven to have been appropriate for the intervention in question?

The original objectives of decreasing fuel consumption and increasing safety have been appropriate and as a result better performing tyres have been placed on the market. However, the original 2008 Impact Assessment did not include considerations on wet grip (safety) for C2 and C3 tyres or on external rolling noise for any of the tyre types. These factors, however, continue to be relevant for the TLR, and manufacturers consider that information about the interaction of all three parameters is crucial for end-users to make an informed choice[62].

c. Evaluation question 3: How well do the (original) objectives of the intervention (still) correspond to the needs within the EU?

There is still a need in the EU to promote cleaner, safer and quieter vehicles. In this context tyre labelling is still very relevant. However, some additional needs have appeared within the EU since the adoption of the current tyre labelling scheme.

The current tyre labelling scheme does not cover re-treaded tyres or studded tyres. In addition, there is no information on the performance of tyres in snow and ice conditions.

Tyre re-treading is a process used to extend the life of used tyres, in particular for C3 tyres. The market share of re-treaded C3 tyres is around 30% in Europe, which corresponds to around 4.3 million tyres[63].

Studded tyres[64] are primarily used in Finland, Sweden and Norway, where the market share is 25% on average of the C1 tyre market. More than 50% of car owners in Sweden and Finland have studded tyres for their cars[65]. In the rest of the EU, the market share can be estimated at around 0.50% of the annual sales according to the 2016 Review Study[66].

Wet grip is generally perceived as a safety rating of the tyre, but this is only true for wet conditions, not for the snow and ice conditions seen in the Nordic countries or in mountainous areas. Tyres with very good level of performance under ice conditions tend to have in general low wet grip rates. The market share of these tyres at EU level is around 30% of the annual C1 tyres sales for snow tyres and around 1% for ice tyres according to the 2016 Review Study.

The fact that these types of tyres are not in the scope of the current TLR means that there is no EU system of information to end-users about such tyres, and they could therefore be misled regarding the safety information because of confusion between the wet grip parameter and performance on snow/ice.

62 According to ETRMA answers to the OPC
63 http://www.etrma.org/uploads/20170912%20-%20Statistics%20booklet%202017%20-%20alternative%20rubber%20section%20FINAL%20web1.pdf
64 Tyres with a number of small metal studs embedded in the tyre tread to improve traction on snowy or icy roads
65 According to C1 end users participating in the consumer survey perfoirmed in relation to the 2016 Review Study
66 For the overall EU, the market share of the studded tyres is around 2%

In general, stakeholders are in favour of including information regarding snow and ice performances on the label (70% according to the OPC). This is also supported by industry (ETRMA).

Respondents to the OPC are also in favour of extension of the scope of the tyre labelling regulation to include retreated tyres (about 65% answer yes). However, only 22% are supporting inclusion of studded tyres. The majority of the respondents' answered "don't know" or "no" to that question.

Some stakeholders, in particular BIPAVER[67] in cooperation with ETRMA[68] and ETRTO[69], are working proactively to find an adequate system for the integration of retreated tyres in the tyre labelling scheme. However, ETRMA also stress that before inclusion of retreated tyres in the tyre labelling scheme it is essential to identify a technically and economically feasible tool or system for establishing the label performance parameters. This is particularly important because of the high number of SME tyre retreaders who will be impacted if retreated tyres are included in the scope.

d. Evaluation question 4: How well adapted is the intervention to subsequent technological or scientific advances?

Since the adoption of the TLR manufacturers have placed better performing tyres on the market especially regarding wet grip. Nevertheless, very few tyres are able to have at the same a high performance (i.e. corresponding to class A) with respect to both fuel efficiency and wet grip.

As more products are now in the highest performing classes of the label (especially with regard to wet grip and noise) re-adjustment of the label classes could be a solution ensuring that the label also in the future will able to pull the market for all the included performance parameters. Also the removal of the bottom classes (through the GSR), means that several of the label classes are no longer utilised, and a re-adjustment of the classes could possibly make it more relevant for future technology.

According to ETRMA, the tyre industry has taken a proactive approach in reducing CO_2 emissions through advanced technology while promoting road safety and other key performance parameters at the same time. In addition, ETRMA argues that because tyres are technologically complex products, tyre development faces a multiple set of customer-oriented performance requirements which often conflict with each other. Therefore, the performances rated on the tyre label are the results of complex engineering development. Against this background, ETRMA finds that the current scaling system of the three performance parameters on the label is already challenging and will remain so in the foreseeable future[70].

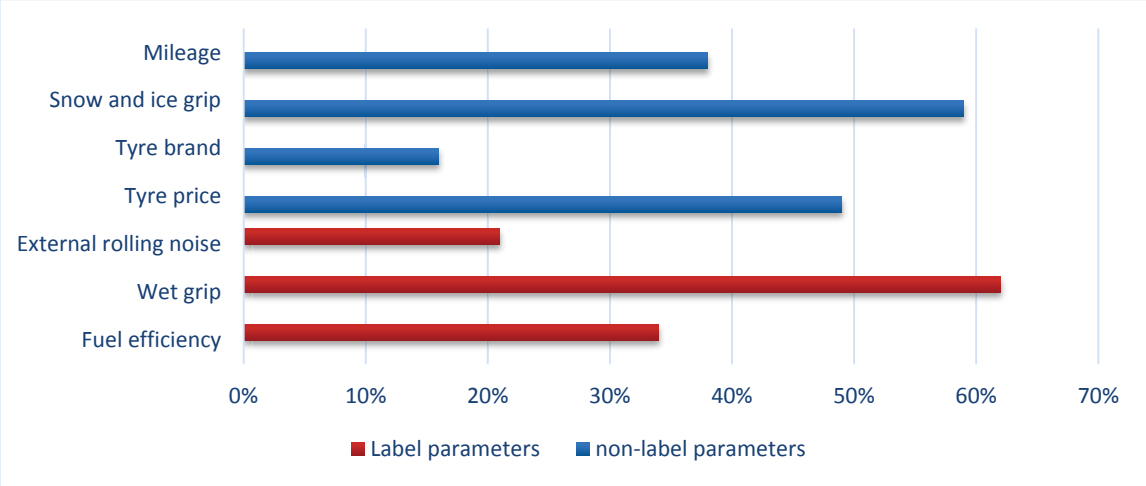
67 European retread industry trade association, representing National retreading associations and suppliers to the retreading industry from 11 Member States https://bipaver.org/
68 European Tyre & Rubber Manufacturer Association, http://www.etrma.org/
69 European Tyre and Rim Technical Organisation, https://www.etrto.org/Home
70 ETRMA contribution to Evaluation Roadmap/Inception Impact assessment. EU tyre labelling scheme – 1222/2009/EC. July 20, 2017.

e. Evaluation question 5: How relevant is the EU intervention to EU citizens?

As the TLR is an intervention that is specifically targeting end-users of tyres, and there are more than 250 million C1 vehicles plus C2 (30 million) and C3 (6 million) vehicles, it is by nature very relevant for EU citizens.

According to respondents to both the OPC and the consumer survey made in relation to the 2016 Review Study, the TLR is indeed relevant; 82% of respondents in the OPC found an EU label on tyres helpful when making a purchasing decision. In both the OPC and the consumer survey, fuel efficiency and wet grip were rated as important parameters, even when comparing to non-label parameters as seen in the figure below.

Figure 23: Percentage of C1 end-users rating different tyre parameters "very important"



Source: consumer survey made in relation to the 2016 Review Study

The external rolling noise, on the other hand, is rated as "very important" by only 21% of end-users (see figure above) and according to ANEC/BEUC[71] "external rolling noise performance does not deliver useful consumer information"[72].

One reason for the low relevance rating of external rolling noise is that it is not the noise experienced by the driver that is measured, but the noise experienced by a bystander when the vehicle drives past. This is important because of environmental noise effects, but users purchasing a new tyre typically find parameters that affect them directly more relevant (e.g. the wet grip and the fuel efficiency).

Another reason might be the lower understanding of the noise pictogram on the label, which according to both the consumer survey and the OPC is the label parameter users find most difficult to understand. Swiss FOEN[73] suggested in the OPC to reconsider the noise pictogram and exchange it with for example a "smiley" scale[74].

71 http://www.beuc.eu/about-beuc/who-we-are
72 Comment from the OPC answer
73 https://www.bafu.admin.ch/bafu/en/home.html
74 *"Reconsider noise pictogram (smileys? :-) / :-I / :-(, add color?)"* **[FOEN]**

Even though the external rolling noise might not be important for the end-user in a purchase situation[75], some still use it in their decision making, and it is still relevant for the EU citizens who are affected by traffic noise.

f. Conclusions on relevance of the TLR

The TLR continues to be highly relevant for promoting fuel efficient and safe tyres with low external rolling noise[76]. The end-users that participated in the survey found the label information relevant when purchasing tyres.

Increasing the fuel efficiency continues to be highly relevant with the EU facing a dependence on energy imports and with the need to limit climate change. With the transport sector constituting one third[77] of European energy consumption, increasing fuel efficiency of road transport plays an important role in addressing these challenges.

Increasing road safety is highly relevant with approximately 24,500 road accident fatalities in the EU in 2017[78]. The Commission has adopted a road safety programme[79] to decrease road deaths between 2011 and 2020[80]. Tyres are an important part of road safety, as they are the only contact between the vehicle and the road. Providing consumers with information on tyre safety parameters is highly relevant as well, with the tyre safety parameter wet grip being a top-level concern for consumers along with price when purchasing tyres[81].

Regulating external rolling noise levels also continues to be highly relevant. The Environmental Noise Directive (END) 2002/49/EC[82] entered into force in 2002 and obliges Member States to report noise levels. The data collected shows that in 2013 70 million people in Europe suffered from unacceptable noise levels in so-called Black Areas, exceeding 65 dB noise levels, and even more in Grey Areas with noise levels between 55 and 65 dB[83]. The WHO recommends night noise levels not higher than 40 dB to protect public health. Regulating external rolling noise thus remains important to mitigate this problem.

5.4. COHERENCE

a. Evaluation question 1: To what extent is this intervention coherent with other interventions which have similar objectives?

75 Based on C1 consumer survey made in correlation to the 2016 Review Study.
76 Regulation 1222/2009 of the European Parliament and of the Council
77 European Commission (2014), "EU Energy in Figures statistical pocketbook 2014", European Union, 2014. ISBN 978-92-79-29317-7. Link: http://ec.europa.eu/energy/sites/ener/files/documents/2014_pocketbook.pdf
78 https://ec.europa.eu/transport/road_safety/specialist/statistics_en#
79 European Commission (2010), "Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions - Towards a European road safety area: policy orientations on road safety 2011-2020". Brussels, July 2010. COM (2010) 389 final. Link: http://ec.europa.eu/transport/road_safety/pdf/com_20072010_en.pdf
80 European Commission (2016), "Mobility and Transport Road Safety; Statistics – accidents data". Website last updated 04.03.2016. Link: http://ec.europa.eu/transport/road_safety/specialist/statistics/index_en.htm
81 Consumer survey with C1 end-users in selected European Countries, Viegand Maagøe, fall 2015. See Appendix 2.
82 Directive 2002/49/EC of the European Parliament and of the Council
83 European Environment Agency (2014), "Exposure to and annoyance by traffic noise", December 2014, Link: http://www.eea.europa.eu/data-and-maps/indicators/exposure-to-and-annoyance-by-1/assessment

Description of the GSR

The TLR was adopted at the same time as the GSR that puts in place harmonised technical requirements that tyres must satisfy to be placed on the EU market.

The GSR removes the worst performing tyres from the market by putting in place minimum requirements for (i) the rolling resistance, (ii) external rolling noise and (iii) wet grip performance of tyres. All three minimum requirements applied from 1 November 2012 for new models of tyres, with a second more stringent set of requirements applied for the rolling resistance of new models of tyres from 1 November 2016.

Effects of the interaction of both Regulations

As a result of the current minimum requirements of the GSR, classes set up by the TLR are outdated: classes G and F (and E for C3 tyres) for rolling resistance, class F for wet grip and the three soundwaves class for noise are now empty. By contrast, the top classes are increasingly populated, in particular for wet grip[84].

The elimination of the bottom classes through the type approval legislation and the migration towards top classes due to technological progress makes a re adjustment of the the label necessary in order to maintain the incentive effect of the labelling scheme.

The TLR is coherent with the GSR. The same measuring methods and performance parameters are applied in both Regulations, and often industry uses the results from the type approval tests to establish the labelling values. The two Regulations are closely related and complement each other. While the GSR sets minimum efficiency requirements to remove the worst performing tyres from the market, the tyre labelling regulation inform end-users of the tyre performance so that they can make informed purchasing decisions (so call combined "push" and "pull" effect).

The TLR and the GSR should be seen as a "parallel" to the EU's Energy Labelling and Ecodesign framework for energy-related products (which is not applicable to means of transport). Similar to the GSR, ecodesign regulations set minimum energy efficiency requirements that products must satisfy before they can be placed on the Union market, while energy labelling regulations (similar to the TLR) provide information to consumer so that they can make better informed choices when purchasing.

This same "push and pull" effect can be seen in the EU mobility framework, where the car labelling Directive helps consumers buy or lease cars which use less fuel and thereby emit less CO_2 and encourages manufacturers to reduce the fuel consumption of new cars, while the Regulation on emission performance standards and reducing CO_2 emissions for new passenger cars sets the minimum requirements for the Union market.

84 2016 Review study on the Tyre Labelling Regulation, https://ec.europa.eu/energy/sites/ener/files/documents/Study%20in%20support%20of%20the%20Review%20of%20the%20Tyre%20Labelling%20Regulation_final.pdf

The TLR is coherent with the framework Energy Labelling Regulation[85] and the implementing measures (Commission Delegated Regulations) adopted under that framework. The design of the label itself as well as the structure of the implementing measures are very similar, although further alignment would be possible.

The efforts by the European Commission to decrease the fuel consumption of passenger cars, LCVs (HCVs interrelate with the TLR on achieving the same goal: higher overall energy savings and emission reductions from road transport within the EU. However, since the tyre rolling resistance causes a certain share of the vehicle fuel consumption, the general decrease in fuel consumption of vehicles, also decreases the absolute value of the saving potential of improving the tyres.

Tyres sold on the OEM (i.e. with a new vehicle) constitute around 25% of the tyre sales in Europe[86]. Even though it is smaller than the replacement market it is still considered important in terms of which tyres are used on European roads. According to the TLR, OEM tyres should only bear the label when end-users are offered a choice between different tyres when they buy a new car (which in most cases they are not[87]). Passenger cars are covered by European fuel efficiency labelling88 with the aim to help consumers buy or lease cars which use less fuel and thereby emit less CO_2. However, the fuel efficiency label for cars does not take the fuel efficiency of tyres into account because cars are tested with standard tyres when establishing the efficiency rating for the fuel label.

b. Evaluation question 2: To what extent is the intervention coherent internally?

Tyres are characterised by several interrelated parameters, and improving one parameter, such as rolling resistance, can have an adverse impact on other parameters, such as wet grip, thereby decreasing road safety. Furthermore, the improvement of wet grip might have an adverse impact on external rolling noise, increasing noise pollution.

It is important for the internal coherence that all three interrelated performance parameters are included in the label. If the wet grip was not included in the label the fuel efficiency could be improved at the expense of the wet grip, which could result in less safe tyres and more accidents.

The implementation of the TLR has especially resulted in improvement of the wet grip performance, while less progress has been achieved for fuel efficiency and only very minor improvements for external rolling noise. This corresponds to the fact that most

[85] Regulation (EU) 2017/1369 of the European Parliament and of the Council setting a framework for energy labelling and repealing Directive 2010/30/EU

[86] Based on statement from ETRMA and calculation methods used in the 2016 Ecodesign Impact Accounting https://ec.europa.eu/energy/sites/ener/files/documents/Ecodesign%20Impacts%20Accounting%20%20-%20status%20January%202016%20-%20Final-20160607%20-%20N....pdf

[87] According to answers in the consumer survey made in relation to the 2016 Review Study

[88] DIRECTIVE 1999/94/EC of the European Parliament and of the Council relating to the availability of consumer information on fuel economy and CO_2 emissions in respect of the marketing of new passenger cars

end-users find the wet grip performance the most important parameter on the label[89]. This is also confirmed by the results of the OPC.

c. Evaluation question 3: To what extent is the intervention coherent with wider EU policy?

The intervention is coherent with wider EU policies for increasing energy efficiency and reducing CO_2 emissions and the TLR contributes positively to achieving the objectives of these policies.

Lowering the demand for energy and 'putting energy efficiency first' is one of the five main objectives of the Energy Union strategy. In 2015, Member States confirmed the imperative need to reach the 20% energy efficiency target for 2020. In November 2016, the Commission proposed to further strengthen this beyond 2020 with a 30% EU energy efficiency target for 2030. That target is currently under examination in the ordinary legislative procedure: there is no sign that final agreement will be on a level of ambition lower than that proposed by the Commission.

The proposed 2030 EU Climate and Energy policy framework sets out binding targets for the non-Emissions Trading System (ETS) sectors (primarily agriculture and transportation) to cut emissions by 30% by 2030 compared to 2005. Legislation is in place to reduce emissions from new cars by 40% in 2021 compared to 2005 and by 19% for new vans in 2020 compared to 2012.

With the transport sector accounting for one third of European energy consumption, increasing the fuel efficiency of vehicles is a key element in decreasing transport emissions and also contributes to reducing the EU's dependence on energy imports.

Therefore, there are major efforts at EU level to reduce CO_2 emissions and air pollution caused by transport. For instance, in its Communication "A European Strategy for Low-Emission Mobility" the Commission announced that by 2050 greenhouse gas emissions from transport need to be 60% lower than in 1990. Similarly, the "Third Mobility Package" will include initiatives to reduce emissions by cars and lorries, to increase safety of road transport and to reduce pollution. The Commission's Communication "A European Strategy for Plastics in a Circular Economy" specifically mentions the need to study how to reduce unintentional release of microplastics from tyres, possibly through tyre design, minimum requirements for abrasion and information requirements.

d. Evaluation question 4: To what extent is the intervention coherent with international obligations?

International UNECE[90] test methods form the basis of the tests in both the tyre energy labelling Regulation and the GSR. The use of globally recognised measurement standards ensures coherence with international approaches and avoids that industry has to test according to different testing methodologies.

89 Review study on the Regulation (EC) No 1222/2009 on the labelling of tyres. March 2016.
90 United Nations Economic Commission for Europe (UNECE), https://www.unece.org/mission.html

No international obligations have been identified for tyres specifically, but in a wider perspective, the TLR is coherent with any obligations related to mitigating climate change.

e. Conclusions to coherence of the TLR

The TLR is coherent with the GSR. The same measuring methods and performance parameters are applied in both Regulations and the two Regulations are closely related and complement each other by acting as push and pull factors on the market, respectively.

The inclusion of all three interrelated performance parameters (wet grip, noise and fuel efficiency) in the label ensured internal coherence.

The intervention is coherent with wider EU policies in place to increase energy efficiency and reduce the CO_2 emissions and the tyre labelling regulation contributes positively to achieve the objectives of these policies. This includes for example the energy efficiency targets in the Energy Union Strategy for 2020 and 2030 and the European Strategy for Low-Emission Mobility (Commission Communication).

With the transport sector accounting for one third of European energy consumption, increasing the fuel efficiency of vehicles is a key element in decreasing transport emissions and contributes to reducing the EU's dependence on energy imports.

Finally, international UNECE test methods form the basis of the tests in both Regulations. The use of globally recognized measurement standards also ensures coherence with international approaches and saves the industry the effort to test according to different testing schemes.

5.5. EU ADDED VALUE

a. Evaluation question 1: What is the additional value resulting from the EU intervention compared to what could reasonable have been expected from Member States acting at national and/or regional levels?

The general stakeholder view as expressed in the OPC and consumer survey related to the 2016 Review study is that an EU-wide label covering all EU countries is preferable over national or regional regulation. 83% of the respondents (including industry respondents) to the OPC found an EU-wide label the best solution. During the OPC and the 2016 Review Study no stakeholder expressed opposition against having the tyre label at EU level.

Furthermore, several stakeholders indirectly support the EU-wide action by expressing in the OPC that they want to expand the reach of the label in terms of for example consolidated market surveillance actions and an EU tyre registration database.

An EU harmonised regulatory framework rather than having rules at Member State level brings down costs for manufacturers and ensures promotion of high-performing tyres. Moreover, given that the TLR is closely linked to the GSR, which operates at EU level, having both regulations operate at different levels would lower their added value.

If instead of the TLR, national or regional regulations would be in place, there would be considerable regulatory barriers to trading tyres because of different rules and requirements. This would make it difficult for businesses to enter the EU market as each Member State would have to be treated as a separate market, imposing considerable regulatory compliance costs.

For tyres the EU legislation preceded any national legislation that could have led to market fragmentation and created obstacles to the free movement of products and to higher costs for both producers and member states.

Furthermore, a Regulation at EU level provides end-users with the same, harmonised information, no matter which Member State they choose to purchase their tyres in, which is increasingly relevant as the online trade increases. With the tyre labelling scheme at EU level, energy efficient and safe tyres reducing noise pollution, are promoted in all Member States, creating a larger market for such tyres and hence larger incentives for the tyre industry to develop them. All Member States will also benefit from the optimised performance of the tyres in terms of lower fuel/energy consumption, lower CO_2 emissions, fewer accidents and fewer people exposed to increased noise levels.

The added value of having an EU-wide regulation compared to what could reasonably be expected from Member States acting at national and/or regional levels is the consistent labelling requirements for all manufacturers throughout the EU, the **reduced cost of market entry** and operation for businesses and the **availability of high performing tyres for all EU citizens** at reasonable costs due to the increased competition on the internal market.

b. Evaluation question 2: What would be the most likely consequences of stopping or withdrawing the existing EU intervention?

Since tyres are a relatively complicated product to test compared to other energy labelled products and no Member States or regions had any performance regulations in place before the EU TLR, it is unlikely that national or regional legislation would be adopted in case the EU label is withdrawn.

If no national regulations were in place, end-users would not be able to find harmonised information on tyre performance regarding fuel efficiency, wet grip or external rolling noise.

If Member States were to adopt national legislation, the most likely effect would be:

- Fewer models on the smaller national markets in particular (low purchasing power or low number of end-users) caused by the increased regulatory and monetary burden of introducing new tyres on the market
- More expensive tyres (to pay for the increased market entry costs faced by producers)
- Less competition and more fragmentation of the market

Without the TLR CO_2 emissions, the number of road accidents and road noise would likely be higher, resulting in increased societal costs from both the effect of climate change, road accidents and noise nuisance.

Most likely, if the EU TLR was withdrawn, **no national or regional legislation would be put in its place**. This would mean that the market would over time approach the performance seen in the BAU (no-label) scenario with **higher rolling resistance, lower wet grip and higher noise levels**.

c. Conclusions to EU added value of the TLR

A harmonised regulatory framework at EU level provides added value to the EU compared to having regulations at Member State level, because it enables businesses to enter a larger market for their products while ensuring high levels of environmental protection.

This strengthens competitiveness EU-wide and facilitates easier inter-European trade of tyres, which also benefits consumers in terms of lower prices and wider range of products.

The objective of reducing the negative environmental impacts of tyres cannot be sufficiently achieved only by the Member States, because this would lead to divergent national provisions and procedures that would result in undue costs for industry (and eventually consumers) and constitute obstacles to the free movement of goods within the EU internal market. Only through harmonised EU rules on tyre labelling, and underlying measurements and testing, can it be ensured that the same model of a tyre has the same published energy class throughout the EU. This is the only way to ensure end-users can compare tyres across the EU.

6. Conclusions

6.1. WHAT IS/IS NOT WORKING AND WHY?

The TLR is working only partly as intended towards the objective of providing end-users with information allowing them to choose more fuel efficient, safer and quieter tyres, since only around half of end-users know of the label. The label parameters continue to be relevant both from an end-user and societal perspective.

The overall fuel consumption for all vehicle types (C1, C2 and C3) has decreased compared to the No-label scenario through decreasing rolling resistance. However, the effect of the TLR on rolling resistance of C3 tyres is reducing after the latest minimum requirements of the GSR were introduced. This limited effect is most likely due to the differing supply chain for C3 tyres and not directly linked to the TLR itself.

The severity of accidents has been brought down through improving the tyre wet grip, which is the parameter rated as most important by both end-users and industry, and therefore also the parameter which has improved the most. However, the relevance of the label could be improved regarding safety, by implementing label parameters for tyre grip on snow and ice.

The external rolling noise is the parameter that has been affected the least by the TLR, and also the parameter rated as least important by end-users. The label is thus not effective in reducing the external rolling noise due to the lower focus on this parameter by end-users and possibly the difficulty to understand the label "scale" for noise.

The end-user awareness and confidence in the label are low according to the consumer survey conducted in correlation with the 2016 Review Study, presumably due to many end-users not seeing the label before purchase, which is partly a consequence of low market surveillance activity and inadequate enforcement in Member States. The awareness and market surveillance efforts can and should be improved by amending the Regulation.

6.2. THE LESSONS LEARNT

The effect of the TLR is strongly correlated with end-user preferences[91], which is for example shown by the achieved market change for rolling resistance and wet grip. The wet grip, which is most important to end-users, has improved the most, followed by rolling resistance (fuel efficiency). External rolling noise has hardly improved at all and is seen by most end-users as least important.

The end-user awareness of the label and knowledge of the parameters and their implications on fuel efficiency, safety and noise pollution is therefore crucial for the continued effectiveness of the label, which is in any case diminishing in comparison to the BAU scenario due to the new limit values implemented through the GSR in 2016.

Market surveillance actions are generally limited and coordination between Member Sate MSAs is necessary to achieve more efficient enforcement. The test costs are considered high, and MSAs experience problems when trying to obtain technical documentation.

6.3. ACTUAL PERFORMANCE COMPARED TO EXPECTATIONS

The original 2008 Impact Assessment for tyre labelling did not consider the label in the form that was eventually decided upon. For C1 tyres only wet grip and rolling resistance was assessed, and for C2 and C3 tyres only fuel efficiency labelling was assessed. Noise

[91] According to consumer survey performed in connection to the 2016Review study

was not considered in any of the options. It is therefore not possible to compare directly the expected savings from the 2008 Impact Assessment and the actual observed savings. However, in terms total cumulated fuel savings from 2012 to 2020, the 2008 Impact Assessment expected 879 PJ cumulated savings for all tyre types (C1, C2, C3), whereas the actual data from 2012 to 2017 shows fuel savings of 1200 PJ.

6.4. ACTIONS TO BE TAKEN

The objectives of the TLR were (i) to provide end-users with information on tyre parameters so that they can make an informed choice, (ii) to influence end-users purchase decisions in favour of more fuel efficient, safer, and quieter tyres, and (iii) to incentivise manufacturers to optimise those tyre parameters, paving the way for more sustainable consumption and production.

The present evaluation shows that effectiveness and efficiency of the TLR can be further improved notably by (i) increasing consumer awareness and confidence in the label (which will make them more likely to use the label information when purchasing tyres), and (ii) improving market surveillance to ultimately fully reach the three objectives of the TLR.

Appendix 1: Stakeholder consultation

Involvement of stakeholders has happened across the 2016 Review Study and the Evaluation / Impact Assessment studies and the same sources have been used in all of them.

I. STAKEHOLDER MEETING

One stakeholder meeting was held in November 2015 connection to the 2016 Review Study, where 37 stakeholders participated form various industry organisations, manufacturers and NGOs. The participants are shown in the table below.

Family Name	***First Name***	***Organisation***
Ahlen	Nils	Swedish Energy Agency
Anadón	Ricard	IDIADA
Bardini	Perla	Pirelli
Bottesini Campos	Alessandro	Vipal Europe SL
Brahy	Olivier	Ministry of Environment
Brito	Henrique	VIPAL RUBBER
Burfien	Joerg	Continental Reifen Deutschland GmbH
Cinaralp	Fazilet	ETRMA
Collins	Desmond	Continental
De Mahieu	Nicolas	ETRTO
Eaton	Adrian	UK Department for Transport
Falcioni	Simone	ETRTO
Gallegos	David	IDIADA
Gaube	Marie	SOLVAY
Goyeneche	Fabienne	Michelin
Guven Sumer	Ayse	ANEC
Gydesen	Annette	Viegand Maagøe
Hansen	Arne	Tyre Business Denmark
Herges	Benedikt	LANXESS
Kemna	Rene	VHK
Lim	Ho Taek	HANKOOK Tire Europe GmbH
López Benítez	Casto	EC - DG MOVE
Loponen	Mika	Finnish Transport Safety Agency
Maya-Drysdale	Larisa	Viegand Maagøe
Moreno Acedo	Juan	EC - DG ENER
Netsch	Lars	TUEV SUED Product Service GmbH
Noirhomme	Jean-Claude	ETRTO
O'Connell	Richard	Bandvulc Tyres Ltd
Ott	Guy	MICHELIN
Perrot	Jean-Dominique	Michelin
Poliscanova	Julia	Transport & Environment
Rames	Mette	Viegand Maagøe

Rieken	Robert	ITMA Europe
Scorianz	Marc-Antoine	UTAC
Shchuryk	Martina	Goodyear
Spuybroek	Ruud	BIPAVER
Sunnari	Jarmo	Nokian Tyres Plc
Taylor	Peter	ITMA Europe
Tosatti	Gianluca	Bridgestone Europe
van der Rijken	Tim	VACO
van Gelderen	Alex	NVR

- **TYRE SUPPLIERS (MANUFACTURERS AND IMPORTERS)**

On the manufacturer side, the European Tyre and Rubber Manufacturers' Association (ETRMA) was identified as the key representative accounting for 76% of the European C1 and C2 tyre markets and 83% of the C3 tyre market[92]. ETRMA has 12 corporate members consisting of large tyre manufacturers, who were reached though online surveys. ETRMA provided sales numbers and inputs throughout the process of both the 2016 Review Study and the evaluation/Impact Assessment study.

On the importer side, the International Tyre Manufacturers' Association (ITMA) was identified as the key representative for non-ETRMA tyre manufactures importing tyres to Europe[93]. By targeting ETRMA and ITMA, 90% of the European tyre market is represented. Interviews were conducted with contacts from key tyre importers provided by ITMA.

- **TYRE DEALERS**

A large number of tyre dealers exist in the European market and in order to get as large a representation of the market as possible they were reached through tyre dealer organisations listed in Table 4. Dealers are in this study defined as those having direct contact with end- users with exception of the 'fleet solution services' used primarily for C3 tyres, where tyre suppliers manage contracts directly with fleet operators [94].

Table 62: European tyre dealer organisations interviewed

NTDA	National Tyre Dealers Association (UK)	200 member companies representing over 2000 retailers
VACO	Industry association for the tire and wheel industry (NL)	350 member companies representing over 730 retailers
FEDERTYRE	Association of tyre specialists of Belgium (BE)	representing companies buying, selling and servicing tyres, rims & wheels
BRV	Federal Association of tyre trade and vulcanisation craft (DE)	800 member companies representing over 3,400 retailers
DRF	Trade organisation for Swedish tyre, rim and service (SE)	860 member companies

92 European Tyre and Rubber Manufacturers' Association, ETRMA (2016), "European Tyre & Rubber Industry; Statistics Edition 2015". Link: http://www.etrma.org/uploads/documents/Statistics%20booklet%20-%20edition%202015.pdf

93 International Tyre Manufacturers' Association (2014), "Europe's Importers show the way", November 18th 2014. Link: http://www.itma-europe.com/2014/11/europes-importers-show-the-way/

94 Information provided by ETRMA. 'Solution services' are services provided by the tyre suppliers where tyres are leased directly to fleet owners/operators charging a price per km driven.

- **VEHICLE SUPPLIERS AND DISTRIBUTORS**

Tyres sold on the OEM constitute approximately 25% of the tyre production in Europe[95]. This part of the tyre market is small compared to the replacement market, but still considered important in terms of which tyres are used on European roads. Interviews were therefore conducted with key representatives of the vehicle suppliers and distributors, which were identified as the European Automobile Manufacturers Association (ACEA) and the European Council for Motor Trades and Repairs (CECRA). ACEA represents the 15 Europe-based car, van, truck and bus makers and has close relations with the 29 national automobile manufacturers' associations in Europe[96]. CECRA brings together 24 national professional associations representing the interests of motor trade and repair business, and 12 European Dealer Councils representing vehicle dealers[97].

Tyres bought on the OEM are not the key product that is purchased, but only a minor part of the vehicle, which is the main product. However, the vehicle distributors are still in direct contact with the end-users, and therefore important for the general label awareness and understanding.

- **C1 END-USERS**

The C1 tyre market is by far the largest in terms of tyre sales, constituting 77% of the tyre sales in 2013[98]. C1 end-users include consumers defined as private persons buying tyres for their own private cars, as well as leasing companies buying tyres for their lease cars.

The main difference between the two segments is that private consumers hold all costs for both tyre purchase and tyre usage, and hence are affected by both the purchase price and the fuel efficiency. The leasing companies on the other hand, hold only the purchase costs, whereas the lessee holds all costs for fuel.

- **CONSUMER SURVEY**

The C1 consumer survey was carried out as an online questionnaire with user-panels of 1000 respondents in six European countries. All respondents were owners of passenger cars who were responsible for the purchase of tyres. The six countries were selected based on the number of registered cars[99], the access to user panels, and the presence of large tyre suppliers in the country. Furthermore, it was based on the geographical coverage, to have answers from both southern and central Europe and from Nordic countries, where the use of snow tyres is more predominant than in the rest of Europe[100]. Based on these considerations, the following countries were chosen:

- Germany (~42 million cars)
- England (~29 million cars)
- France (~32 million cars)
- Italy (~37 million cars)

95 Braungardt et al. (2014), "Impact of Ecodesign and Energy/Tyre Labelling on R&D and Technology Innovation", Link: http://www.ecofys.com/files/files/fraunhofer-ecofys-2014-impact-of-ecodesign-energy-labelling-on-innovation.pdf

96 ACEA, European Automobile Manufacturers Association, (2016), "Who we are" general website. Link: http://www.acea.be/about-acea/who-we-are

97 CECRA, The European Council for Motor Trades and Repairs (2016), "About CECRA", General website. Link: http://www.cecra.eu/page/about

98 Van Holsteijn en Kemna B.V. - VHK (2014), "Ecodesign impact accounting – Part 1, Status Nov. 2013", Link: https://ec.europa.eu/energy/sites/ener/files/documents/2014_06_ecodesign_impact_accounting_part1.pdf.

99 Odyssee-Mure Project (2012), "Energy Efficiency Trends in Transport in the EU" , Link: http://www.odyssee-mure.eu/publications/efficiency-by-sector/transport/)

100 Lennart Lomaeus, chairman of DFTF Sweden (Swedish Tyre, Rim & Accessories Suppliers Association) (2015), Presentation: "Winter tyre Market's segments evolution in the Nordic countries".

- Sweden (~4,5 million cars)
- Finland (~3 million cars)

The results of the C1 end-user survey are shown in the end of this annex.

- **LEASING COMPANIES**

According to Lease Europe[101], the leasing companies represent around 25% (2010[102]) of the European carpark. Ten companies were identified as key players in the European car leasing market, and an attempt to establish contact for potential interviews was done. Most of the companies did not show any interest in answering questions about the EU-tyre labelling scheme. Therefore, interviews have only been made with a few leasing companies in Denmark.

The main purpose of interviewing leasing companies was to identify any significant differences in tyre purchasing behaviour and use of the tyre label compared to private consumers.

- **C2 END-USERS**

C2 end-users are the purchasers and users of C2 tyres, used for light duty vehicles (LDV's). The C2 end-users can be individuals or companies who own or rent LDV's. The main difference is that LDV owners are affected by both the tyre purchase cost and the tyre fuel efficiency (in terms of fuel cost), whilst lessees of LDV's holds only the costs for fuel.

- **C3 END-USERS**

The C3 end-users are primarily truck fleet owners and operators. Existing truck fleet surveys were used in this study to reach a larger amount of truck fleet operators than would otherwise have been possible. The two main studies applied were performed by M2 Conceal (on behalf of Goodyear)[103] and by Commercial Motors Trucking Britain[104]. Since it was not possible within the frame of this study to make an equally thorough survey with fleet owners, results from these two surveys were used for information on C3 end-users.

- **MEMBER STATE AUTHORITIES (MSAS)**

As part of the 2016 Review Study, MSAs from Belgium, Finland, Germany (3 Regions), Estonia, Malta, Netherlands (mail), Sweden, United Kingdom, Hungary (mail), Poland and Slovakia were interviewed. This provides insight in the types of activities carried out and the differences in how market surveillance is approached in the Member States.

An overview of the market surveillance activities in the Member States is shown in the table below. The information is both form the interviews and from ADCO minutes. The inspections are counted as either number of shops or number of tyres or tyres sets inspected and the units are therefore not aligned.

The prevailing type of Market Surveillance in all Member States is the point of sales inspections. Some Member States inspected only physical shops, while many also inspected internet shops. In

101 Lease Europe represents about 92% of the entire European leasing market; Link: http://www.leaseurope.org/uploads/documents/ranking/Leaseurope%20Ranking%20Survey%202013_public.pdf

102 Lease Europe (2011), "The European Leasing & Automotive Rental Markets – State of Play" Link: http://www.leaseurope.org/uploads/documents/events/seminar_for_lessors/2011/Jurgita%20Bucyte_WEB.pdf

103 MV2 Conseil on behalf of Goodyear (2013), Truck fleet survey, Link: http://www.fleetfirst.eu/ff_home_en/news/goodyear-fleet-survey-reveals-growing-influence.jsp

104 Commercial Motor (2013), "The Ronseat approach", Ocotber 10th 2013 pp 32-35. Link: http://archive.commercialmotor.com/article/10th-october-2013/32/the-ronseat-approach

all Member States, the main task was to inspect the presence of the label, and that it was positioned correctly.

In general, the MSAs found high level of compliance regarding position of the label and information on bills and invoices. However, the actual level seemed to vary greatly, from 0% non-compliance to 25%, which seems to be due to differences in inspection procedures. The non-compliance occurred in various ways with the most widespread being the label entirely missing or positioned wrong.

Document control was only carried out by four of the interviewed Member State. Both the Swedish MSA and the MSAs of the individual federal states of Germany reported difficulties in requiring the documentation due to lacking jurisdiction when suppliers/supplier representatives are located in other countries/Member States. The MSAs are appointed and empowered by national law in a specific Member State, and hence suppliers located in other Member States can claim they have no obligation toward the MSAs.

In most Member States, it was not attempted to require the technical documentation, since they were either aware of the problem of lacking jurisdiction, or because without laboratory testing, there were no frame of reference to verify the information in the technical documentation.

Only two of the interviewed MSAs, Germany and Belgium, performed laboratory tests to verify the label values. All Member States mentioned the high costs and too few accredited test facilities to be the greatest barriers for laboratory testing.

Member State	Surveillance activities	Number of inspections	Non- compliance
Sweden	Shop inspections including internet shops	>30 shops since 2012	No non-compliance
	Document control	10 that failed (no documents received)	
Estonia	Tyre documents and questionnaire regarding supplier responsibility	Around 100 tyre sets per year	
	Shop inspections (physical shops)	Around 5-10 tyre sets per year	Low non-compliance
Netherlands	Shop inspections	760 shops since 2012	<10% non-compliance
	Information campaign by the ministry not the MSA itself	Targeting mainly end-users	
Poland	Inspections at suppliers, importers, retailers	135 entities since 2013, 640 tyre models	No or low non-compliance
	Technical documentation inspection	No specific number, but reports that it is many	No problems of receiving documentation
Germany – Hesse	Shop inspections including internet shops	172 shops in 2014	19 shops with no labelling
	Technical documentation	Requested 5 documents	All received
	Laboratory testing	Send to Rhineland-Palatinate	
Germany – Rhineland-Palatinate	Shop inspections	362 inspections in 2014 674 inspections in 2015	119 of the 362 inspections in 2014
	Technical documentation inspection	For the tyres they test in laboratory	
	Laboratory tests	4 models in 2014 8 models in 2015	Problem with varying test results
Germany – Baden Wüerttemberg	Shop inspections	174 models/41 shops in 2014 316 models/31 shops in 2015	No non-compliance (2015 final numbers to be registered)
	Technical promotional material	30 inspections	
Germany – Bavarian	Shop inspections	50 shops, 64 tyre models	12 non-compliance

			cases from missing or faulty label
	Technical documentation inspection	8 tyre models (same models that were tested)	
	Laboratory tests	8 tyre models	1 not compliant, 1 pending
Finland	Shop inspections (physical shops)	150 shops since 2013	Low non-compliance
United Kingdom	Awareness campaigns; tyre dealers, importers, car dealers	More than 500 visits in total since 2013	Website monitoring, 2013: 62 tyre brands – 10 had not label, 18 had incomplete information
	Shop inspections		
	Website monitoring		
	Technical documentation control	Requested for 10 models	Received for 8 models
Malta	Information campaigns; end-users, tyre dealers	Merged with energy labelling campaign	
	Shop inspections, including internet	15 shops 1 internet store (87 tyre models)	Two tyre models not compliant
Belgium	Shop inspections	76 shops since 2013 (only C1) 36 in 2013 and 40 in 2015	In 2015: all showed the label*
	Technical documentation control	Requested for 10 C1 models	Only received some of them. Request again.
	Lab test	2 C1 models currently tested	Test ongoing
Portugal	Have not yet implemented the national legislation to appoint a MSA		
Italy	Reported that no inspection or other market surveillance activities were conducted		
Slovakia	Shop inspections including internet shops	70 dealers inspected in 2014 (solely based on complaints)	4 were non-compliant

- **RESULTS OF THE CONSUMER SURVEY WITH C1 END-USERS**

userneeds
Online fieldwork

Viegand & Maagøe – EU tyre study

Userneeds, 23rd of October 2015
Anna Dinesen

Project specifications

Target group: The survey is conducted among 18-70 year old car owners in:
- Sweden
- Finland
- United Kingdom
- Germany
- France
- Italy

Method: Online survey, the survey is conducted in Userneeds' panels in Sweden and Finland and Userneeds' partner panels in United Kingdom, Germany, France and Italy.

Number of interviews: In total 6051 interviews have been completed.
- 1011 in Sweden
- 1015 in Finland
- 1002 in United Kingdom
- 1007 in Germany
- 1008 in France
- 1008 in Italy

Average interview time: 7,5 minutes

Period of data collection: 2nd of October 2015 to 19th of October 2015

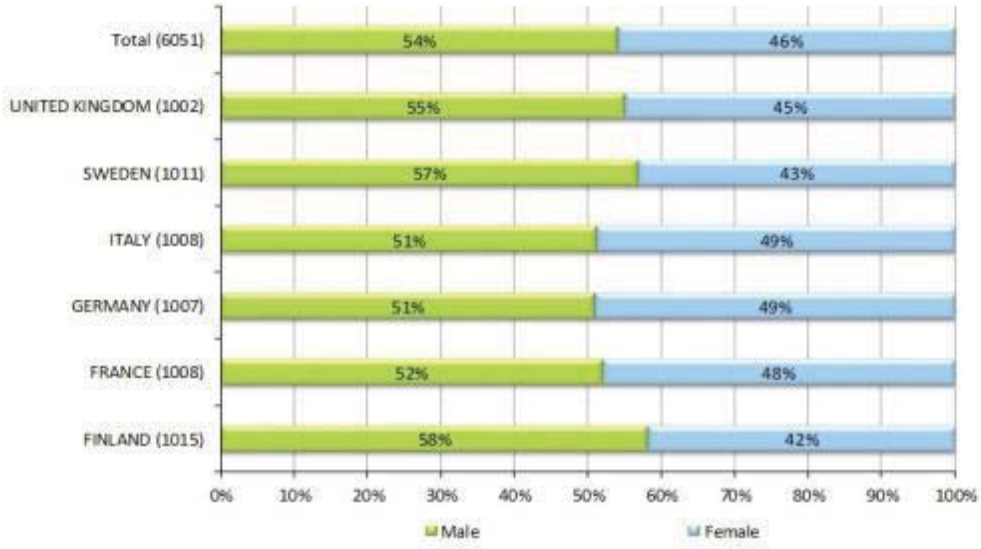
Agenda

Background

- All car owners
- Buyers of new tyres for passenger car 2013-2015
- Buyers of new (not used) passenger car 2013-2015

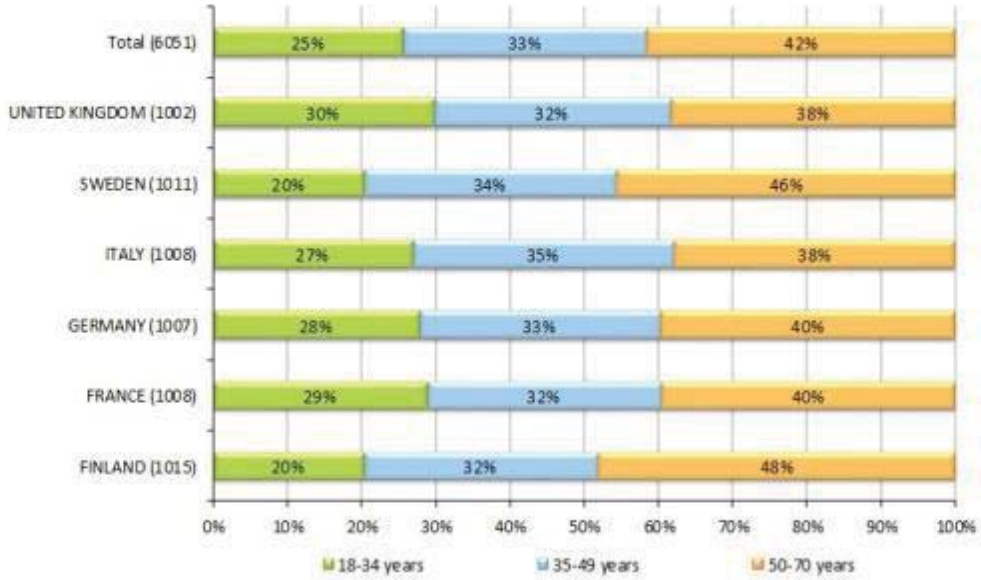
userneeds

What is your gender?



userneeds

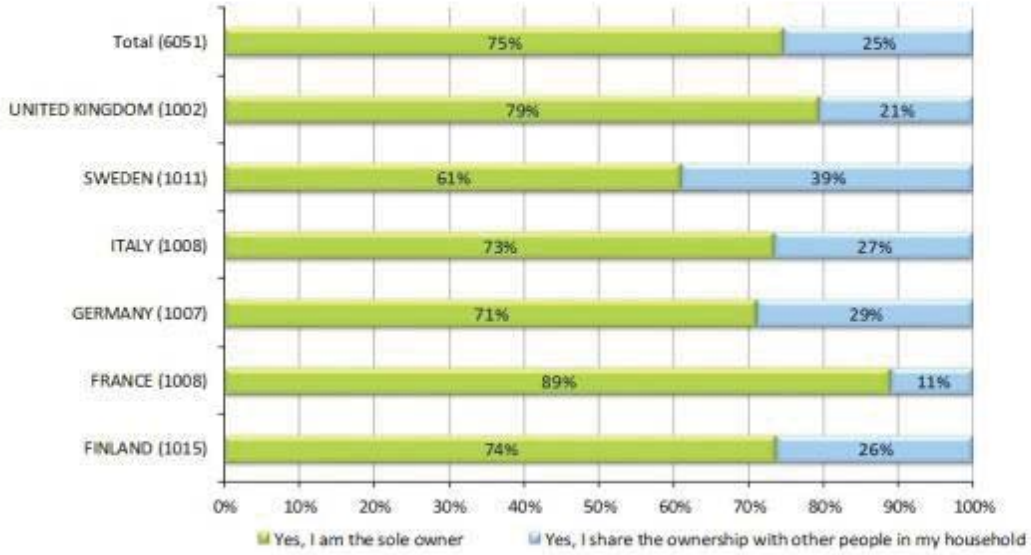
How old are you?



userneeds

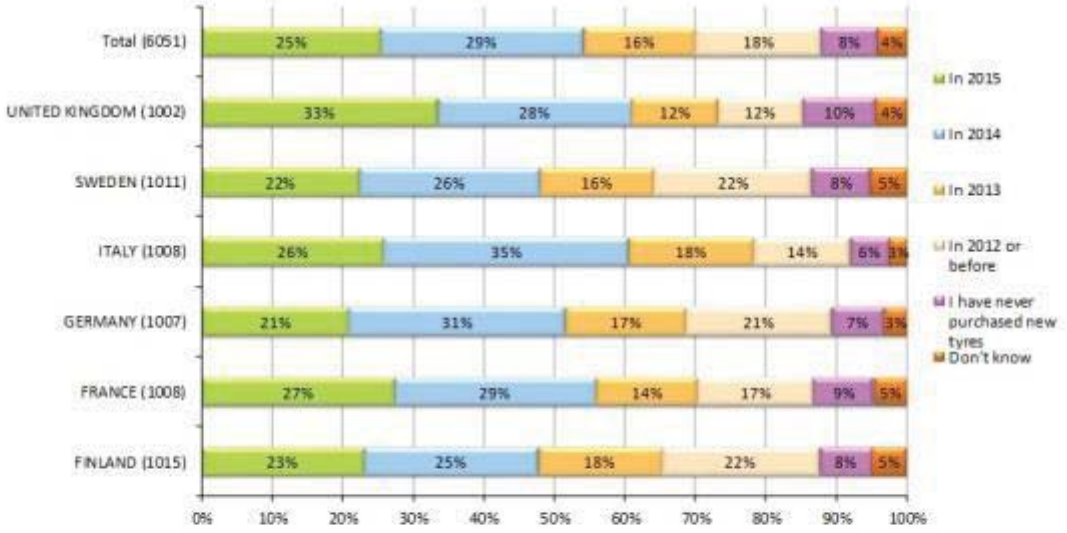
Do you own a passenger car?

(Leased car, carpool and suchlike are NOT included)

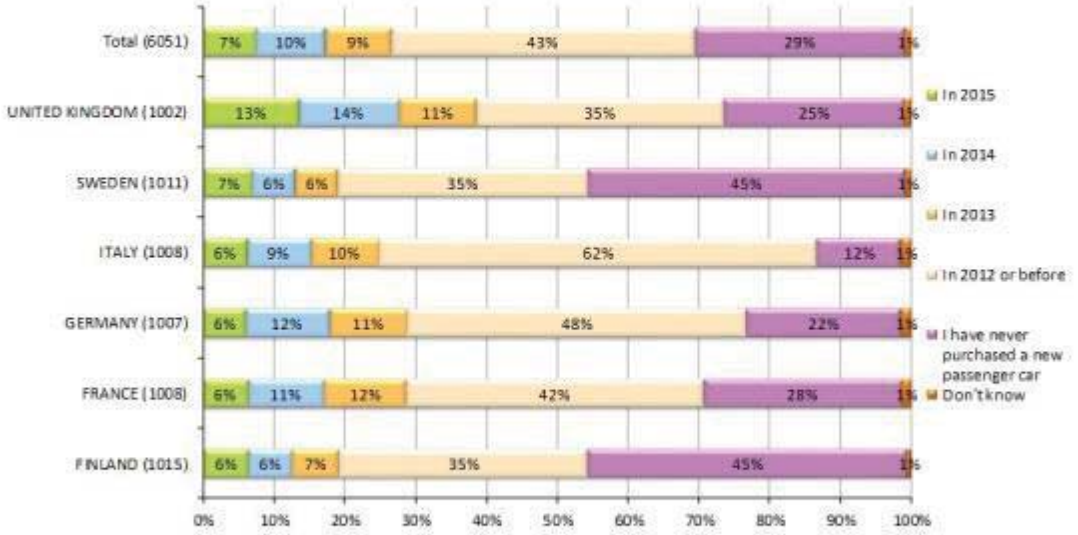


userneeds

When was the last time you purchased new (not used) tyres for a passenger car (without purchasing a car at the same time)?



When was the last time you purchased a new (not used) passenger car?



Agenda

- Background

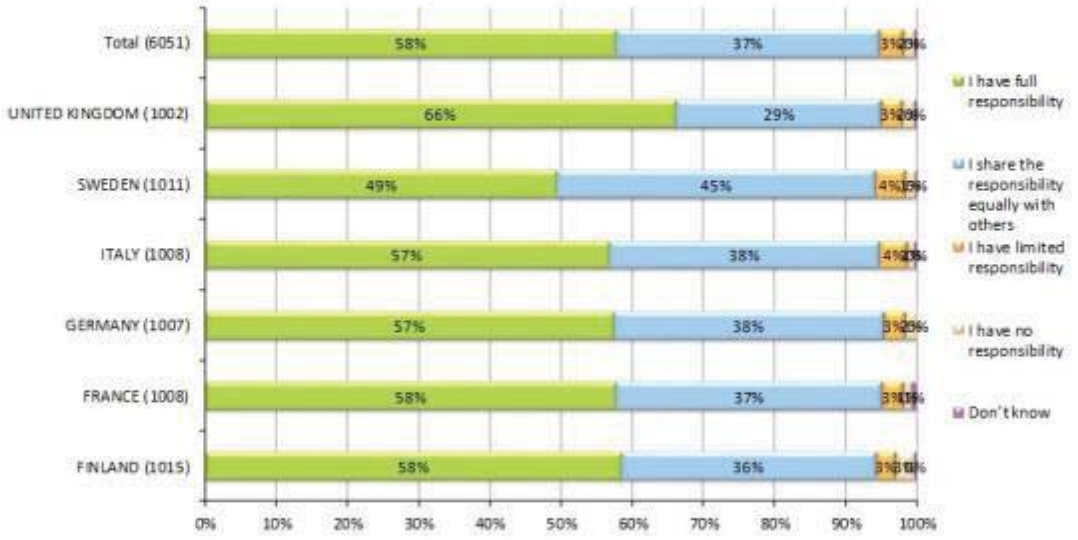
All car owners

- Buyers of new tyres for passenger car 2013-2015
- Buyers of new (not used) passenger car 2013-2015

userneeds

What is your level of responsibility regarding the activities listed below?

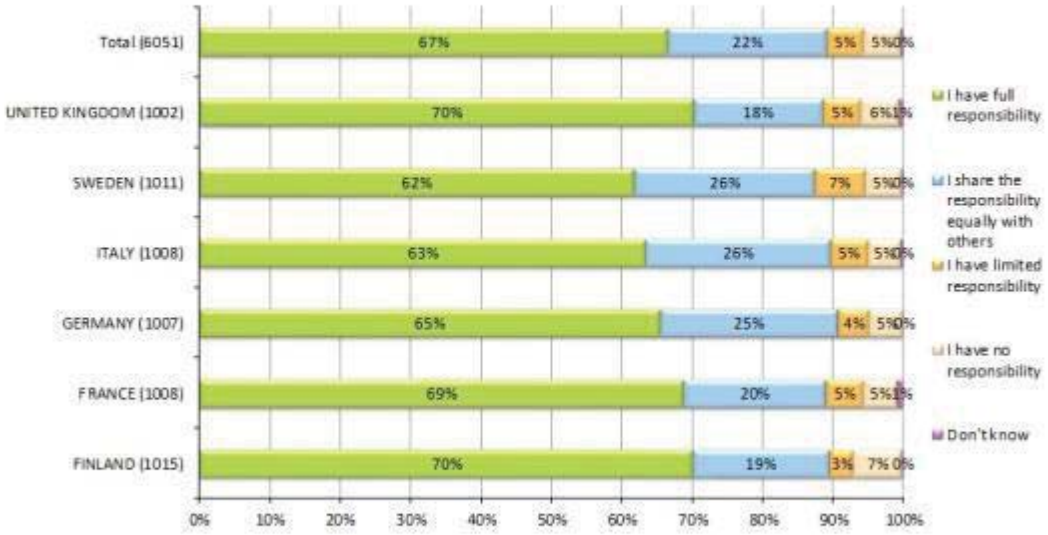
Purchase of car



userneeds

What is your level of responsibility regarding the activities listed below?

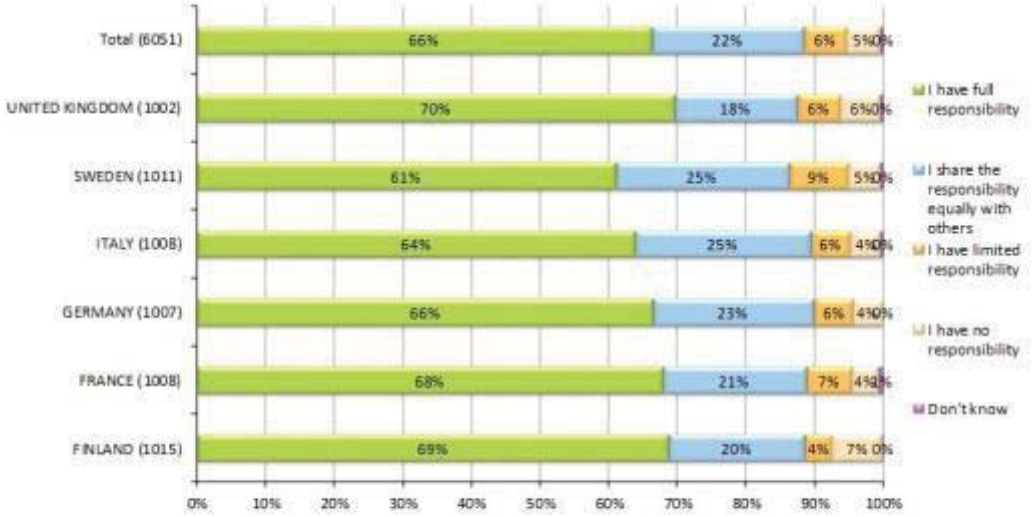
Purchase of tyres



userneeds

What is your level of responsibility regarding the activities listed below?

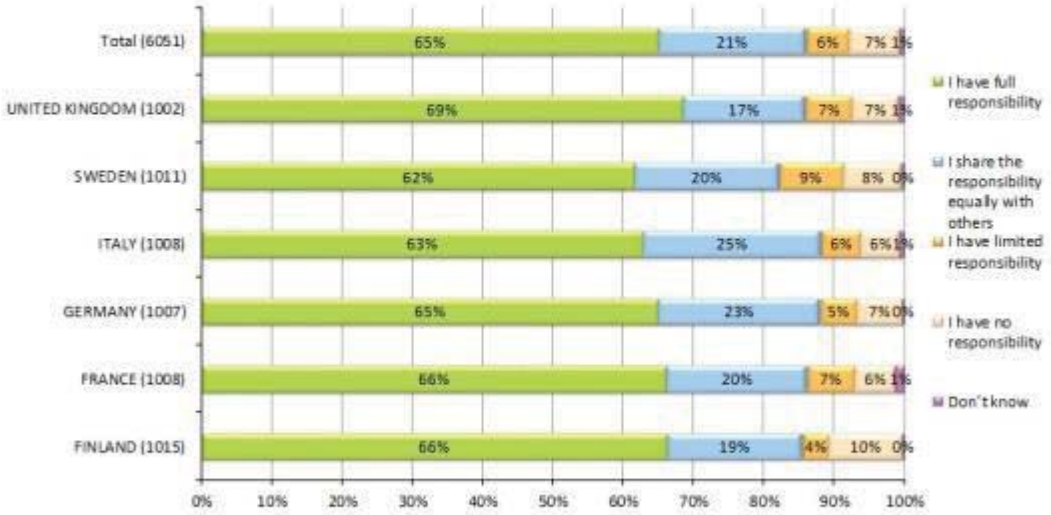
General maintenance of car



userneeds

What is your level of responsibility regarding the activities listed below?

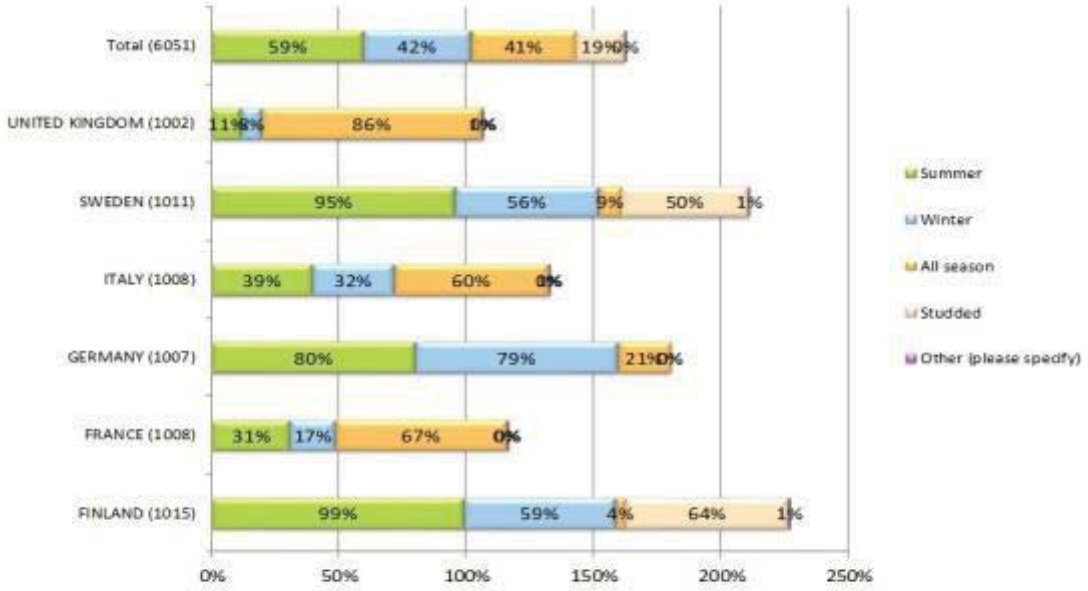
General maintenance of tyres (for instance changing from summer to winter tyres and checking tyre pressure)



userneeds

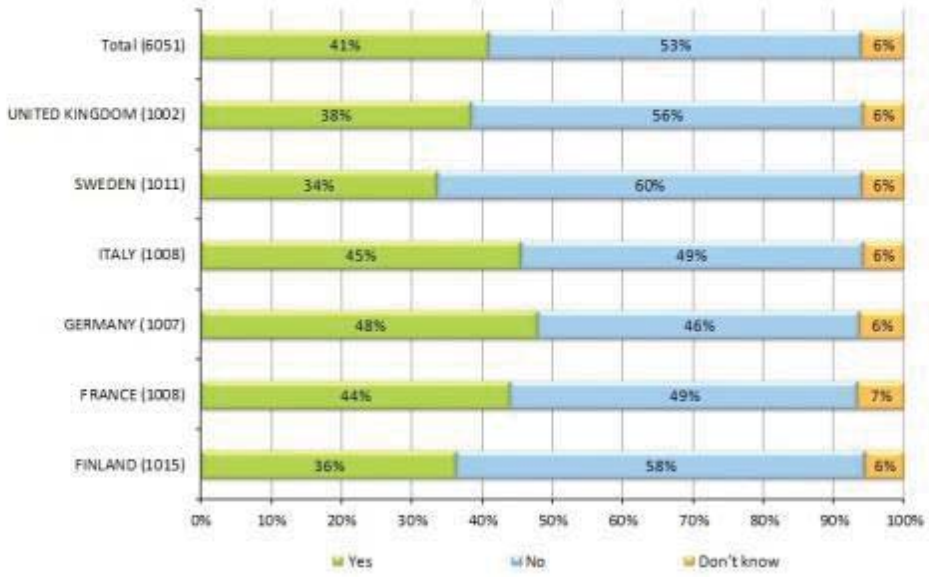
Please specify all types of tyres you have for your car.

Please indicate all those that apply



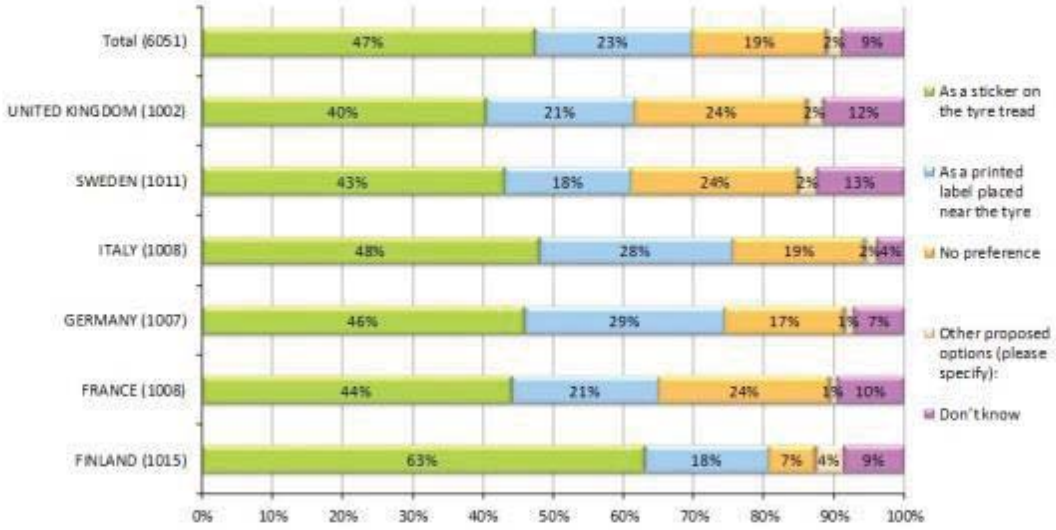
userneeds

Were you aware of the tyre label below before you began this questionnaire?



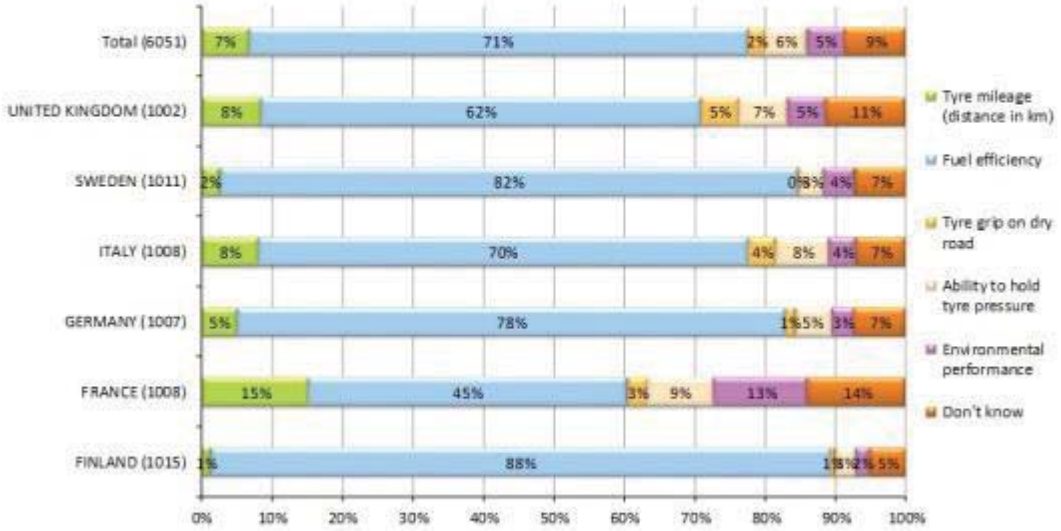
userneeds

According to the rules, the label should be displayed in the shop as a sticker on the tyre tread or as a printed label placed near the tyres. Which way do you think the tyre label is most visible?

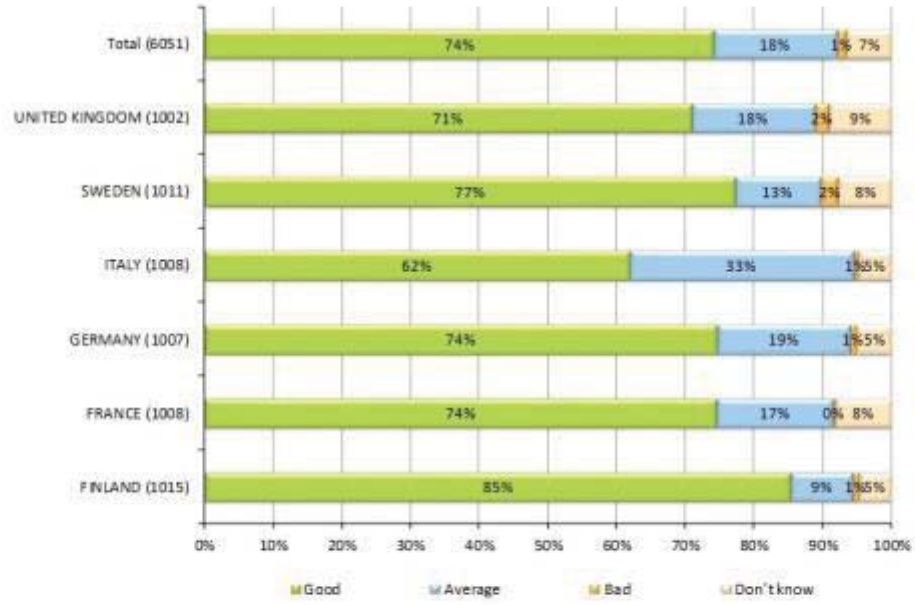


userneeds

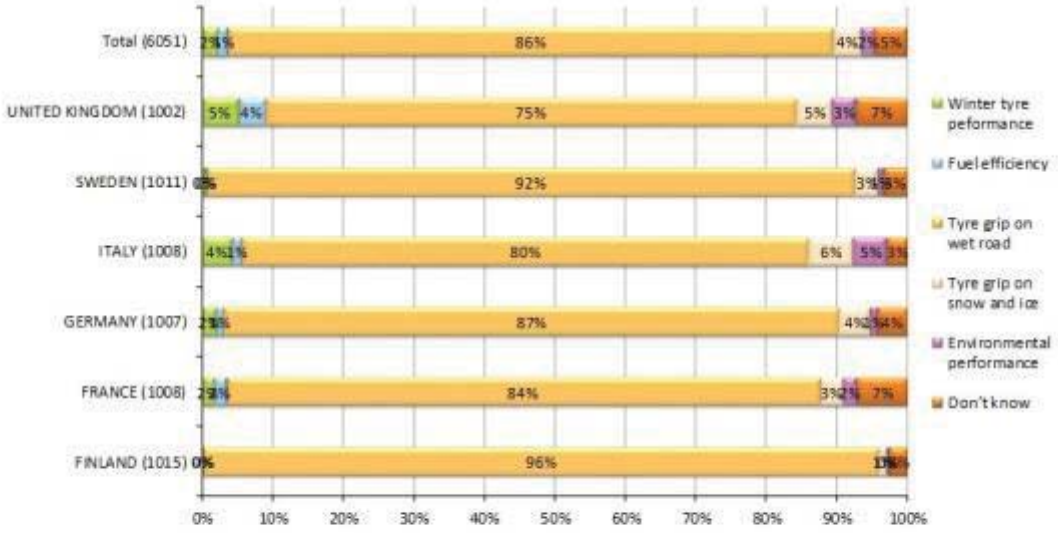
The label includes information about three basic tyre performance areas. Each of the performance areas are illustrated by a blue icon on the label.
Please indicate what you think is meant by the blue icon in the picture below (Q3a).



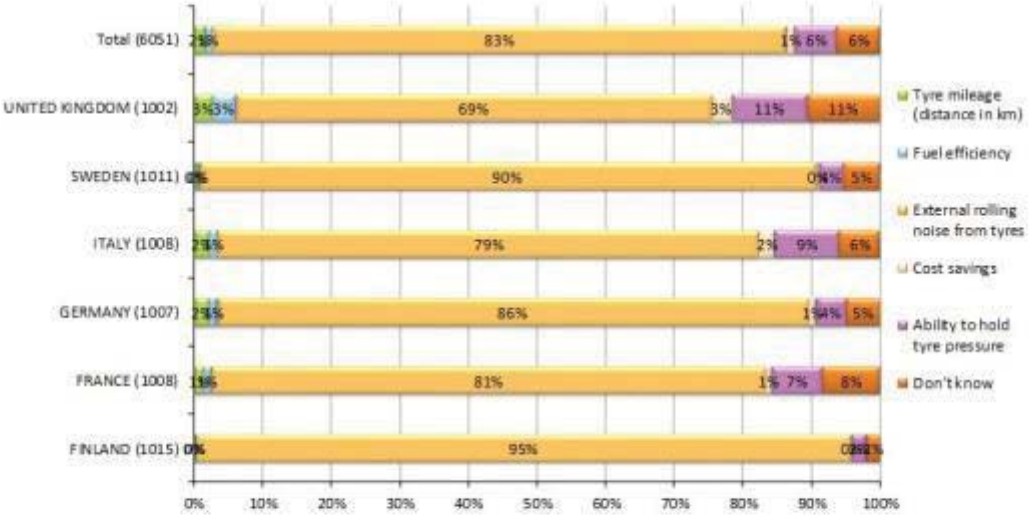
How well the tyre is performing with respect to the relevant performance area is indicated on a scale from A-G or by waves.
Please indicate how well you think the tyre is performing with regard to the performance area in question (Q3aa).



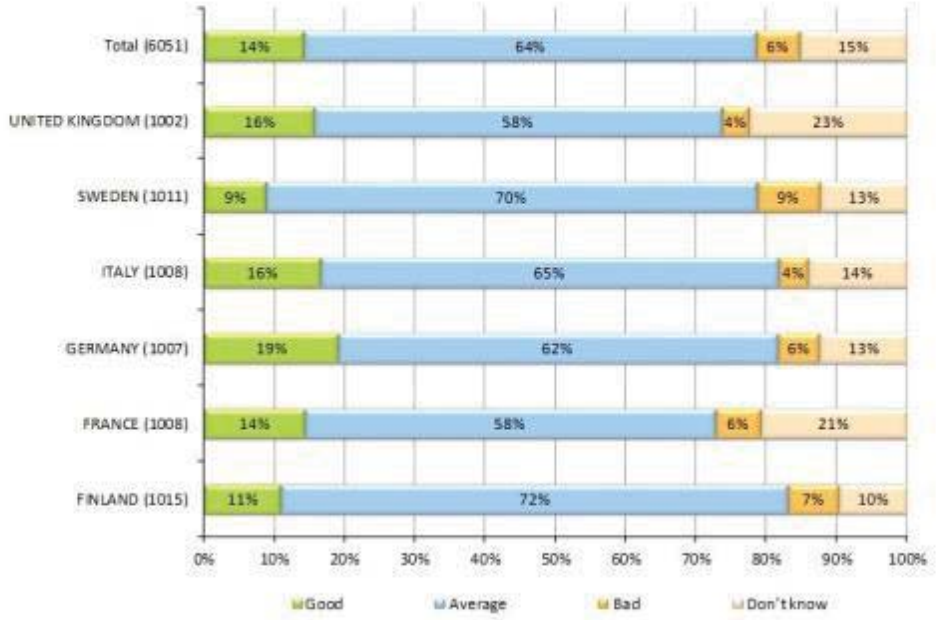
The label includes information about three basic tyre performance areas. Each of the performance areas are illustrated by a blue icon on the label.
Please indicate what you think is meant by the blue icon in the picture below (Q3b).



The label includes information about three basic tyre performance areas.
Each of the performance areas are illustrated by a blue icon on the label.
Please indicate what you think is meant by the blue icon in the picture below (Q3c).



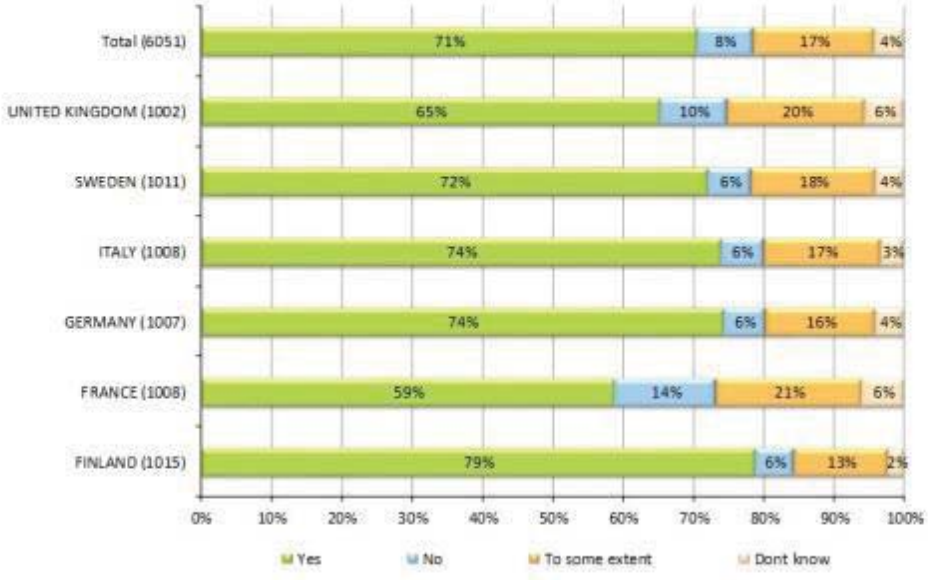
How well the tyre is performing with respect to the relevant performance area is indicated on a scale from A-G or by waves.
Please indicate how well you think the tyre is performing with regard to the performance area in question (Q3cc).



userneeds

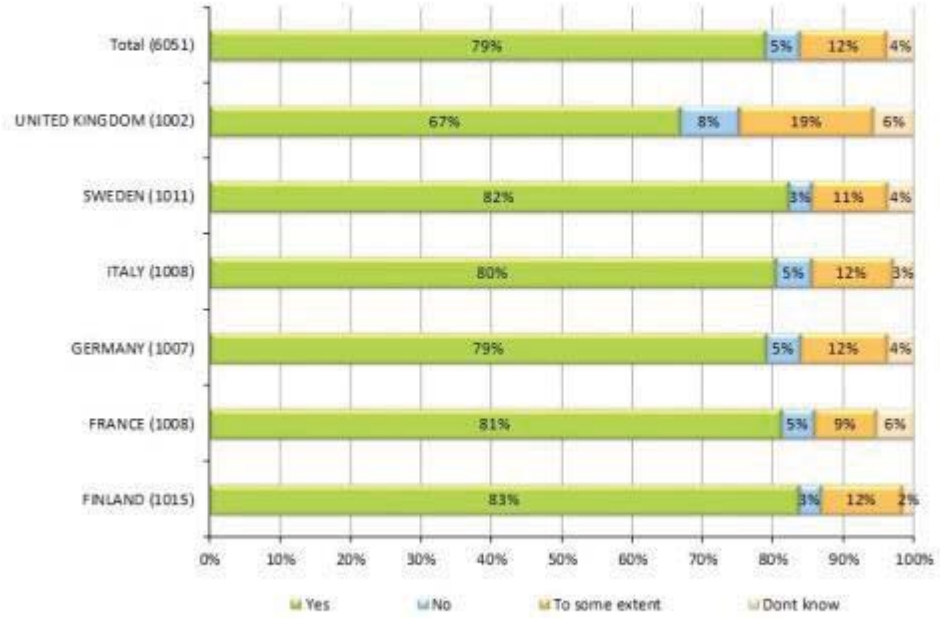
The icons refer respectively to fuel efficiency, tyre grip on wet road and external rolling noise. Do you find the icons and the information on the label easy to understand?

I find the information about fuel efficiency easy to understand



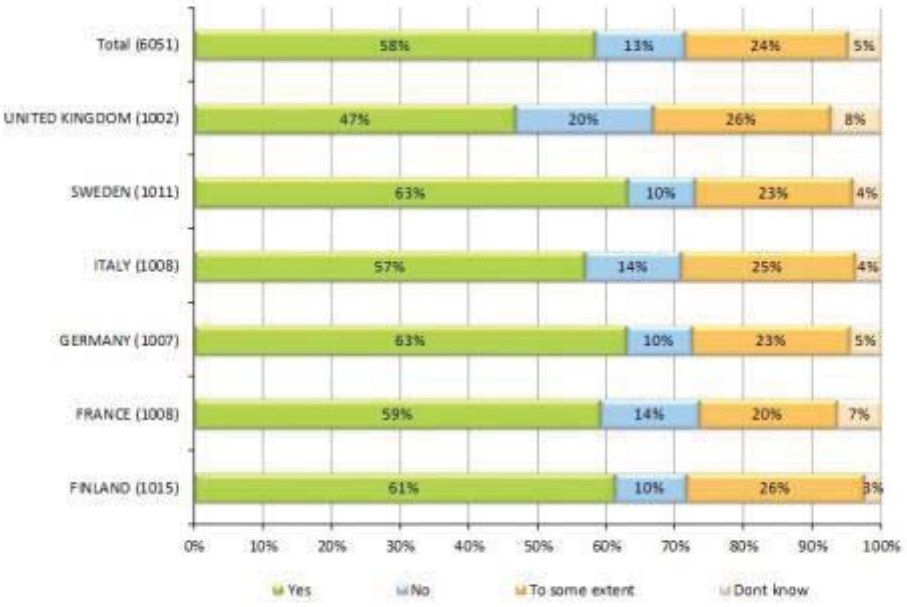
userneeds

The icons refer respectively to fuel efficiency, tyre grip on wet road (wet grip) and external rolling noise. Do you find the icons and the information on the label easy to understand?
I find the information about wet grip easy to understand



userneeds

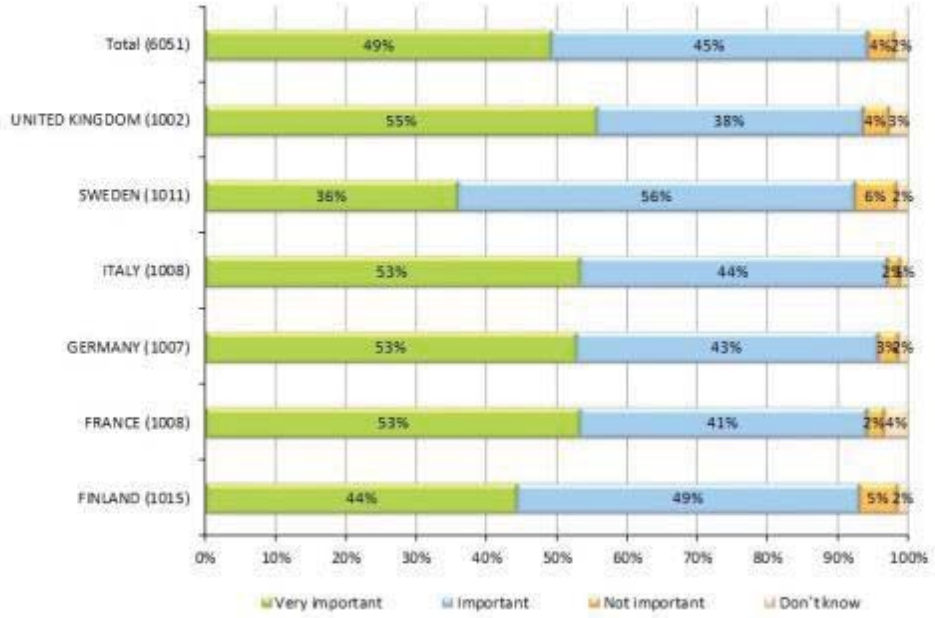
The icons refer respectively to fuel efficiency, tyre grip on wet road and external rolling noise. Do you find the icons and the information on the label easy to understand?
I find the information about external rolling noise easy to understand



userneeds

How important would the following tyre performance areas be to you, if you were to buy new tyres?

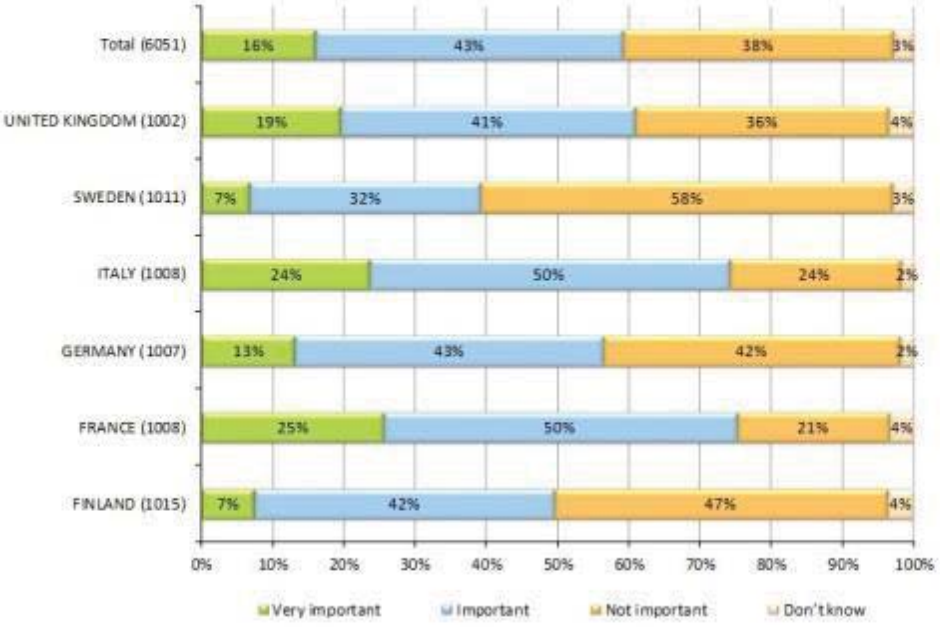
Tyre price



userneeds

How important would the following tyre performance areas be to you, if you were to buy new tyres?

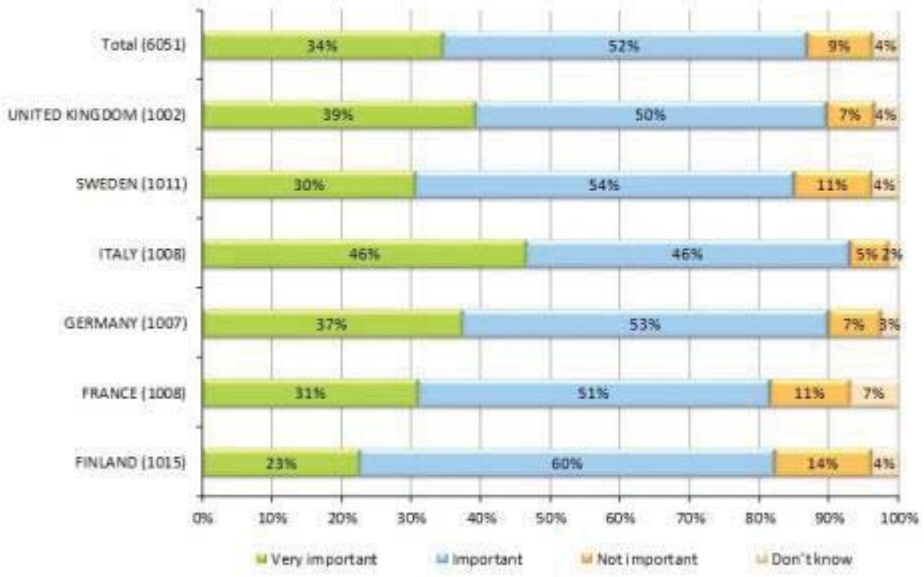
Tyre brand



userneeds

How important would the following tyre performance areas be to you, if you were to buy new tyres?

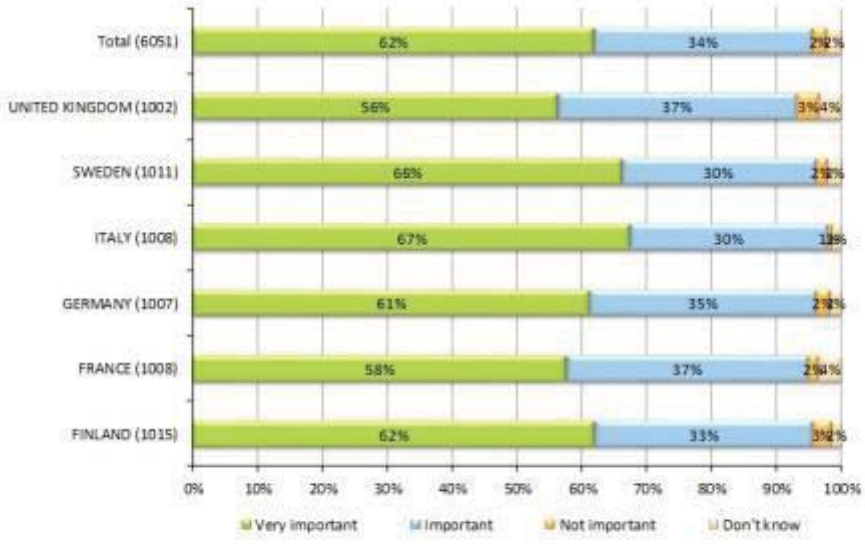
Fuel efficiency



userneeds

How important would the following tyre performance areas be to you, if you were to buy new tyres?

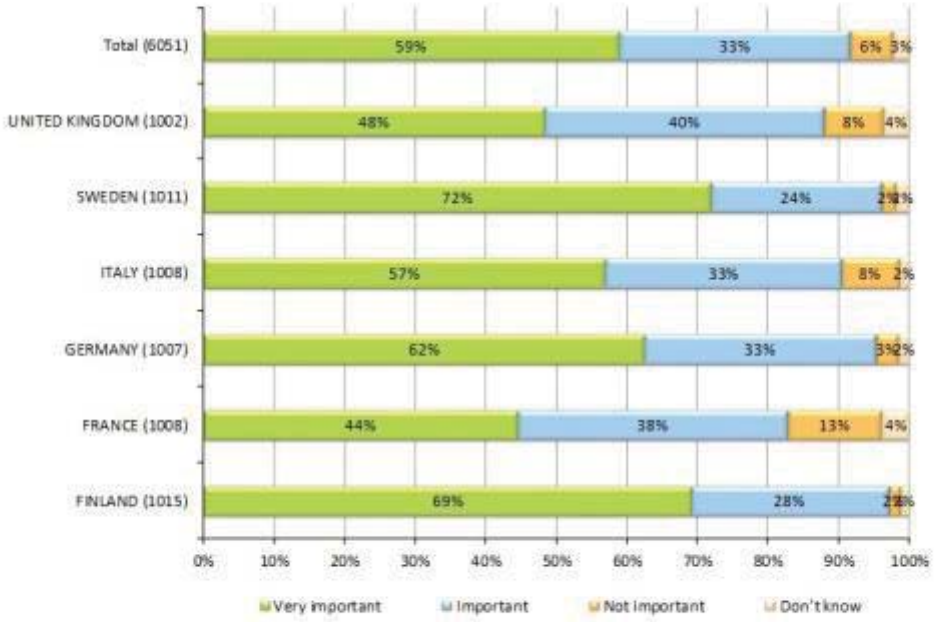
Tyre grip on wet road



userneeds

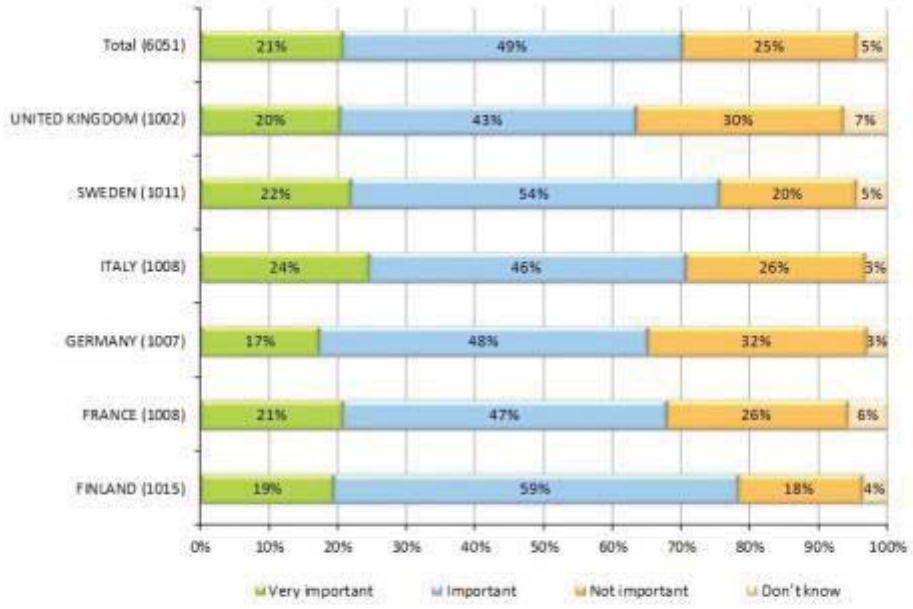
How important would the following tyre performance areas be to you, if you were to buy new tyres?

Tyre grip on snow and ice



How important would the following tyre performance areas be to you, if you were to buy new tyres?

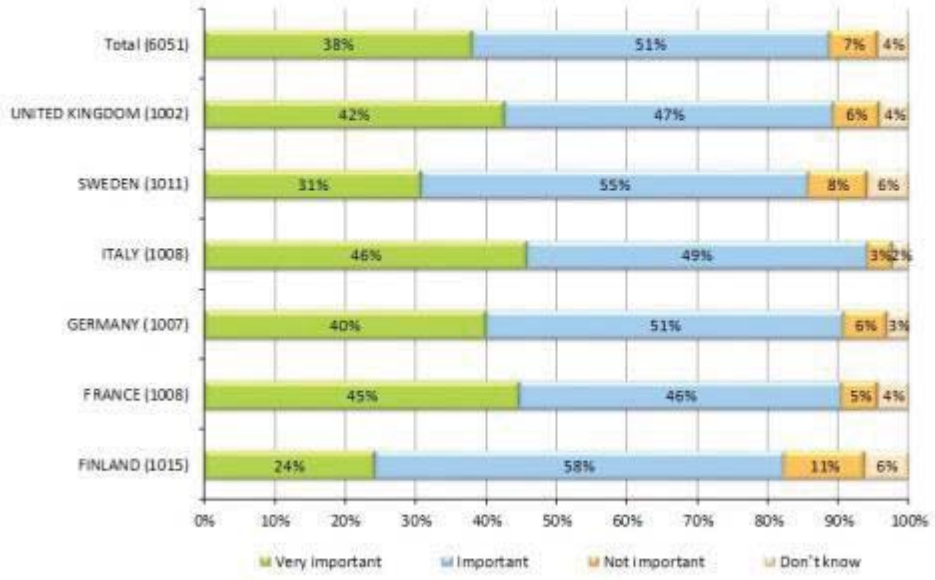
External rolling noise



userneeds

How important would the following tyre performance areas be to you, if you were to buy new tyres?

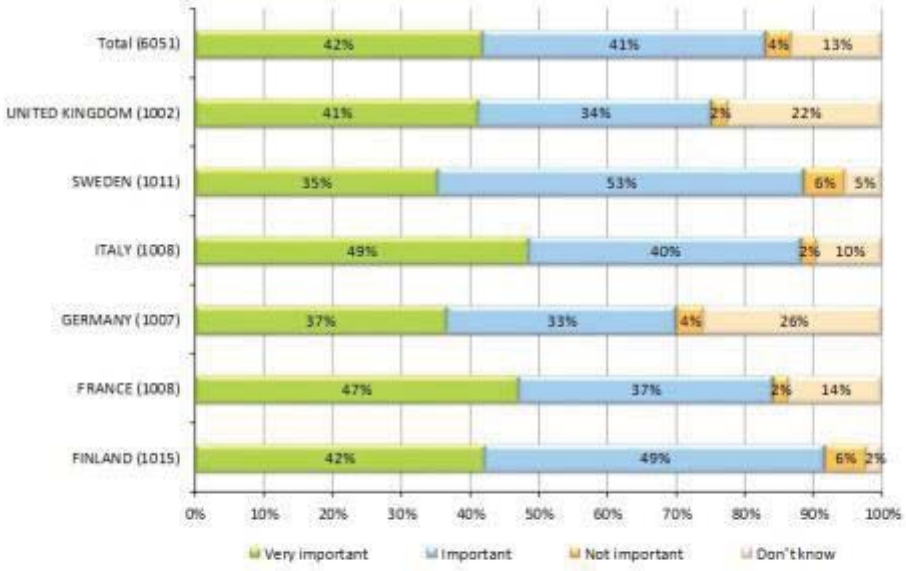
Tyre mileage (distance in km)



userneeds

How important would the following performance areas be to you, if you were to buy studded tyres:

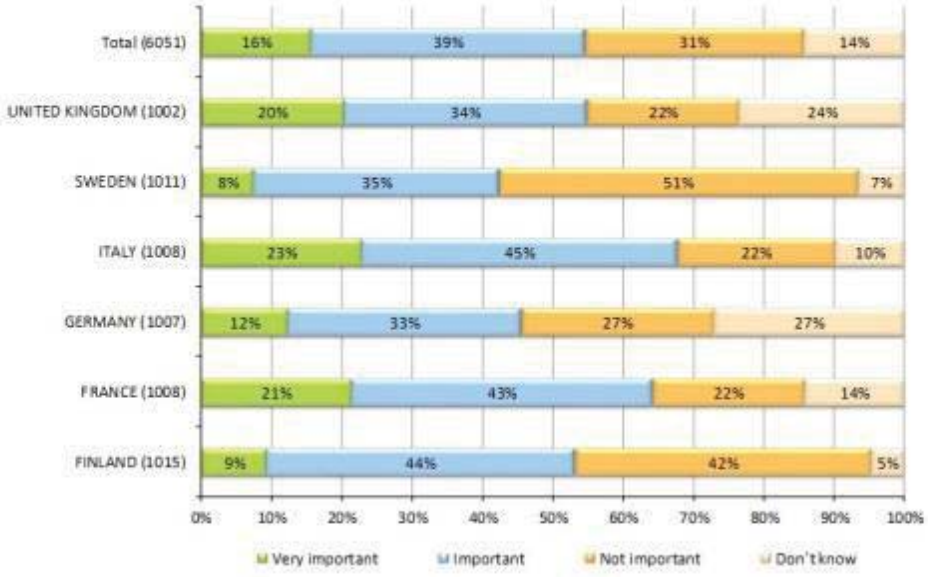
Tyre price



userneeds

How important would the following performance areas be to you, if you were to buy studded tyres:

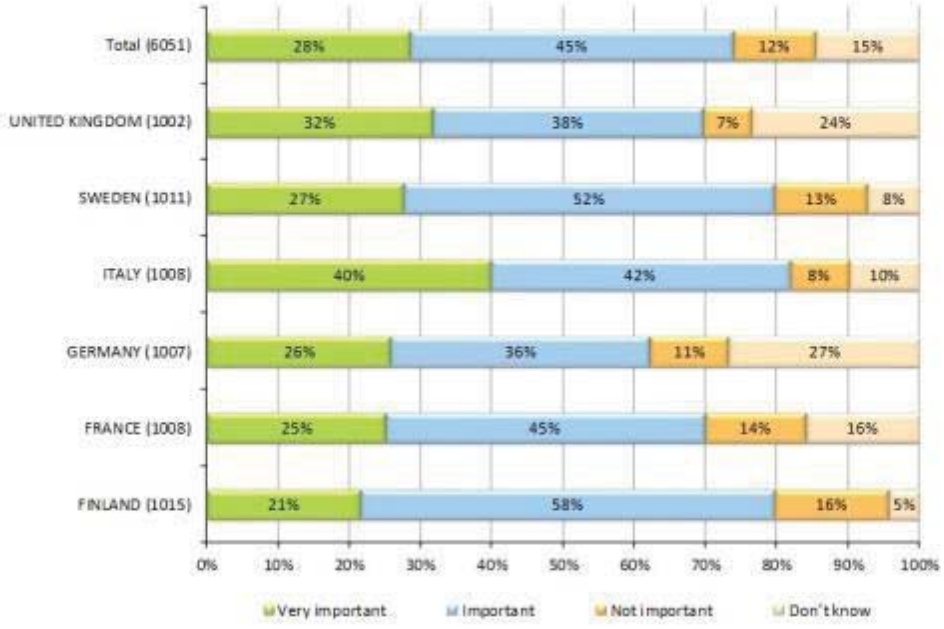
Tyre brand



userneeds

How important would the following performance areas be to you, if you were to buy studded tyres:

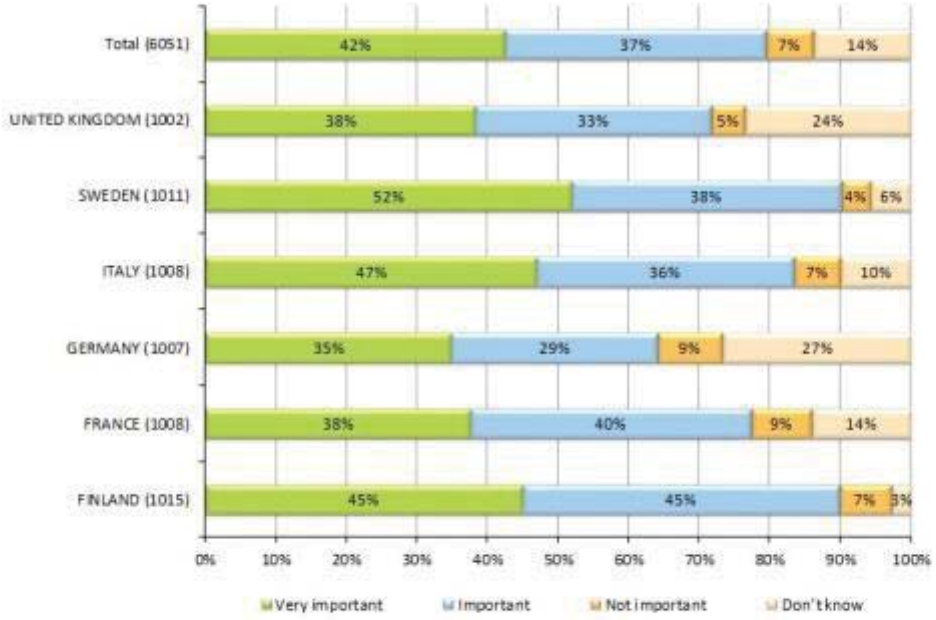
Fuel efficiency



userneeds

How important would the following performance areas be to you, if you were to buy studded tyres:

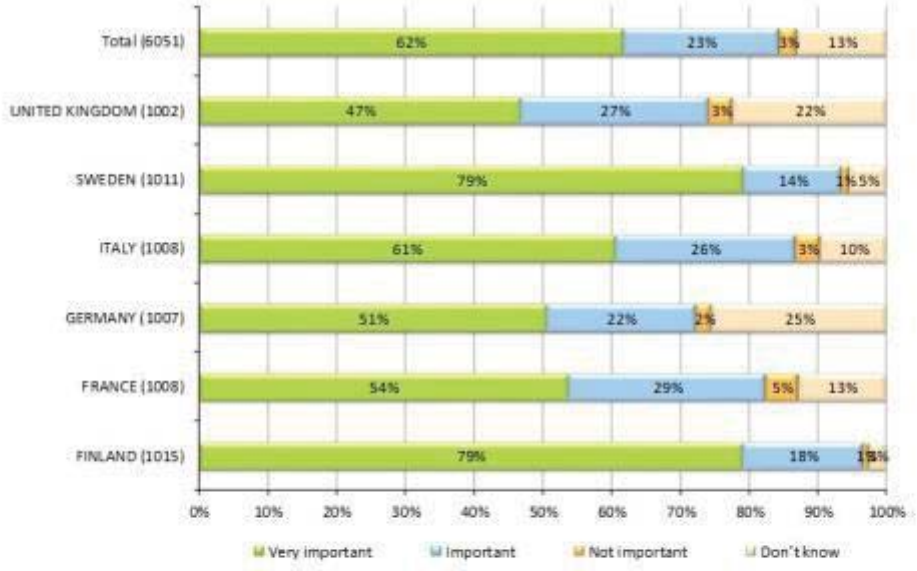
Tyre grip on wet road



usermeeds

How important would the following performance areas be to you, if you were to buy studded tyres:

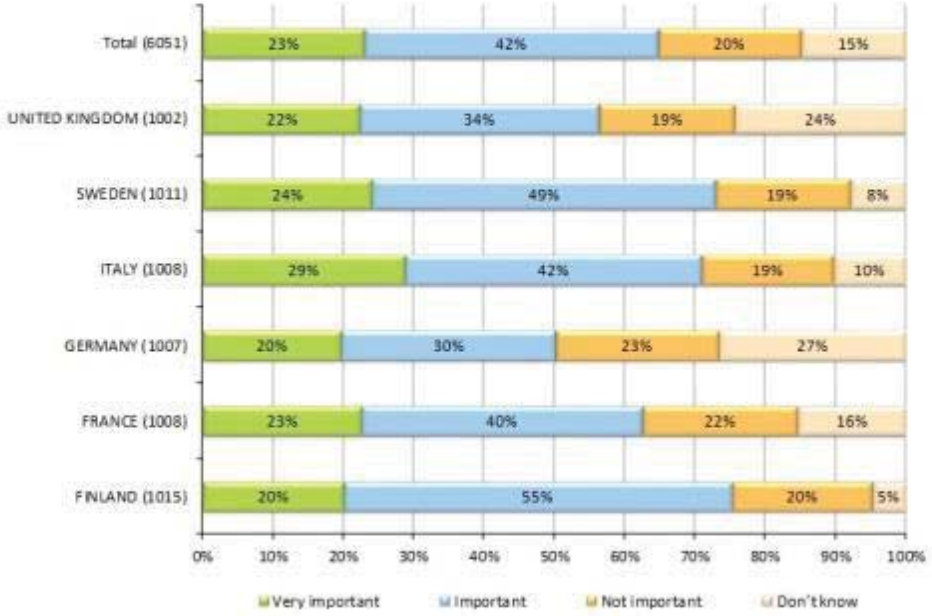
Tyre grip on snow and ice



usermeeds

How important would the following performance areas be to you, if you were to buy studded tyres:

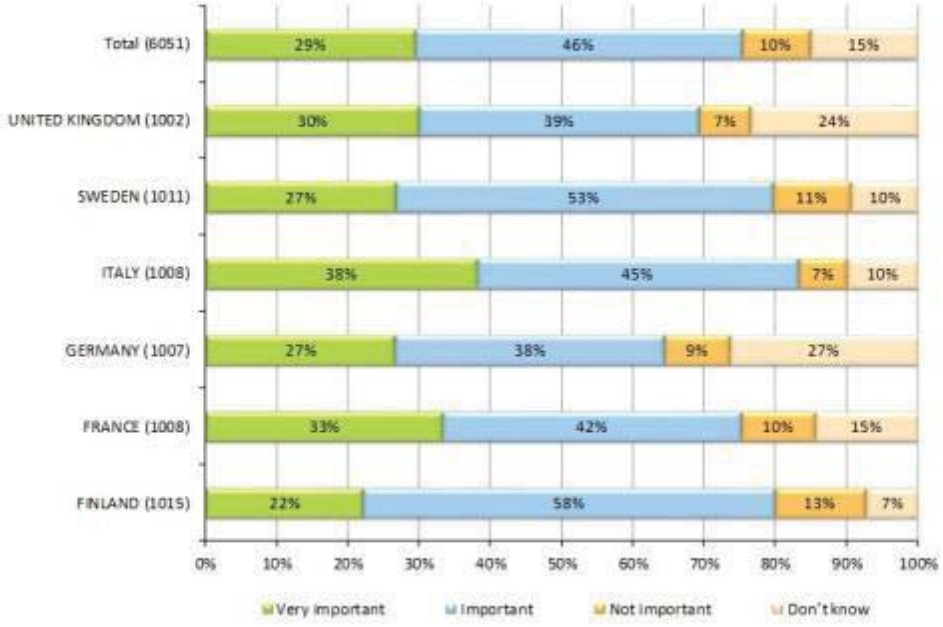
External rolling noise



userneeds

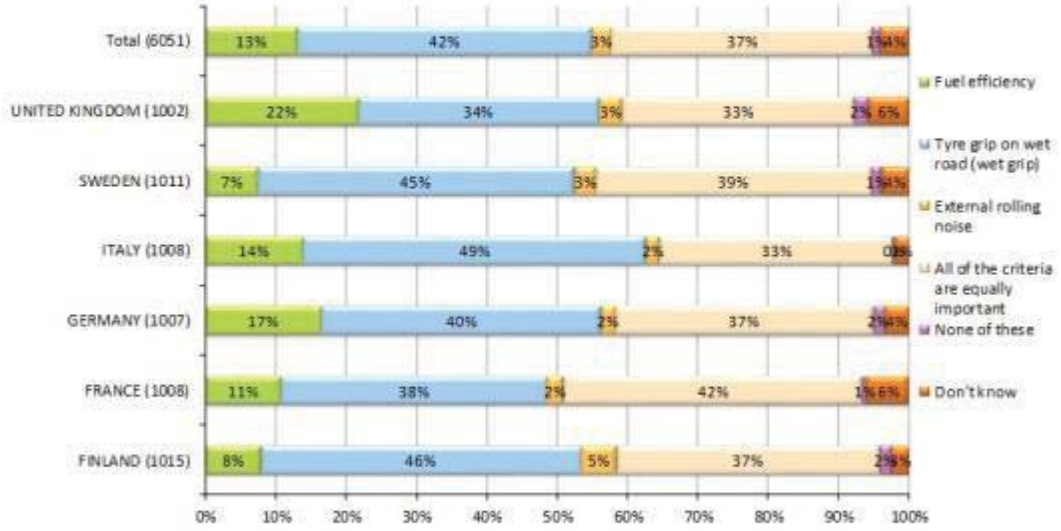
How important would the following performance areas be to you, if you were to buy studded tyres:

Tyre mileage (distance in km)



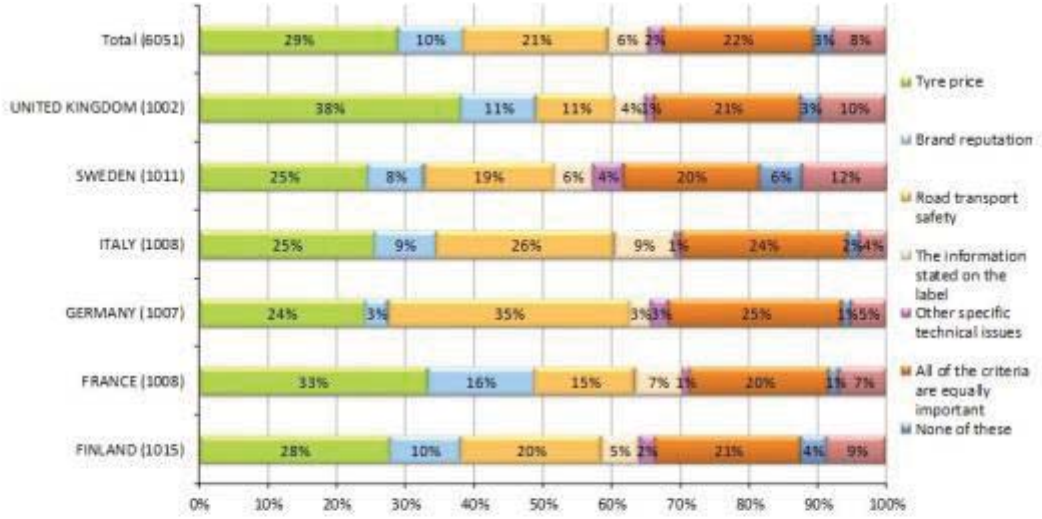
userneeds

Which of the tyre performance areas on the label is the most important for you?



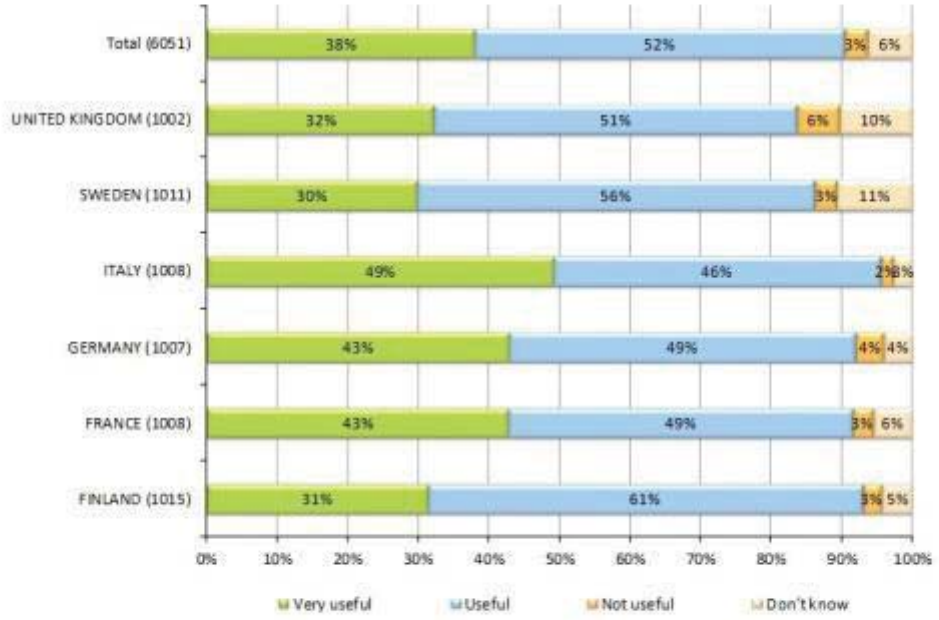
userneeds

At your last tyre purchase, what was the most important factor in your choice of purchase?



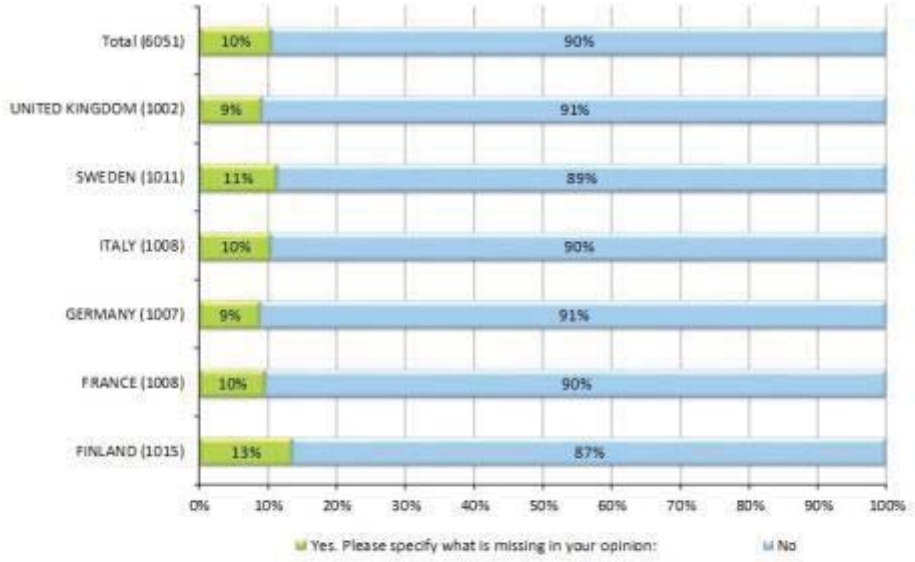
userneeds

How useful do you find the information on the tyre label?



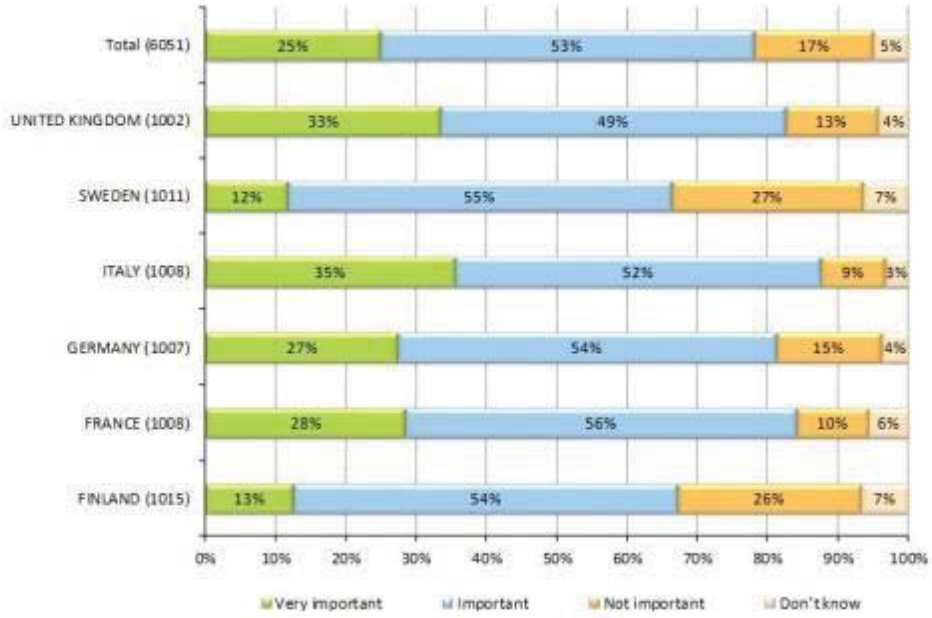
userneeds

Is there any information or are there any performance areas missing in the current labelling scheme in your opinion?

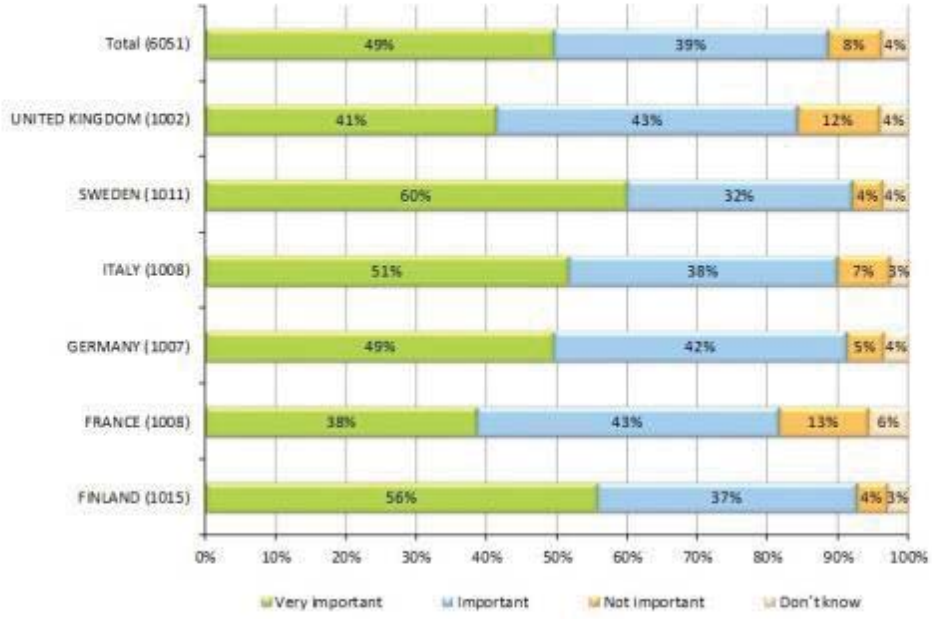


userneeds

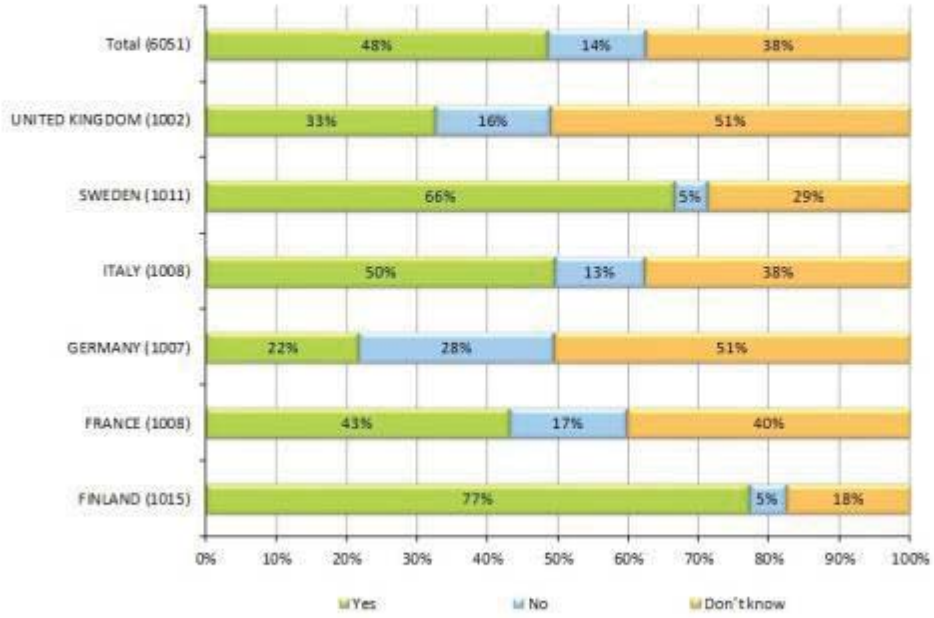
Today information about mileage (distance in km) and tyre grip on snow and ice is not currently shown on the label. How important is it for you to have this information on the label?
Information about mileage



Today information about mileage (distance in km) and tyre grip on snow and ice is not currently shown on the label. How important is it for you to have this information on the label?
Information about grip in snowy or icy conditions

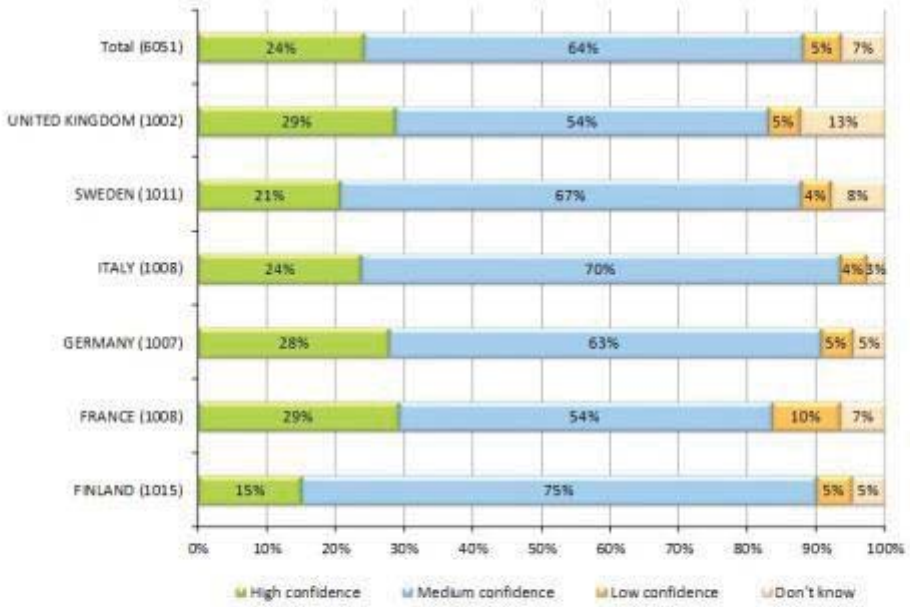


Currently studded tyres are not covered by the labelling scheme (they are not sold with the label). Would you like to have studded tyres included in the scheme?



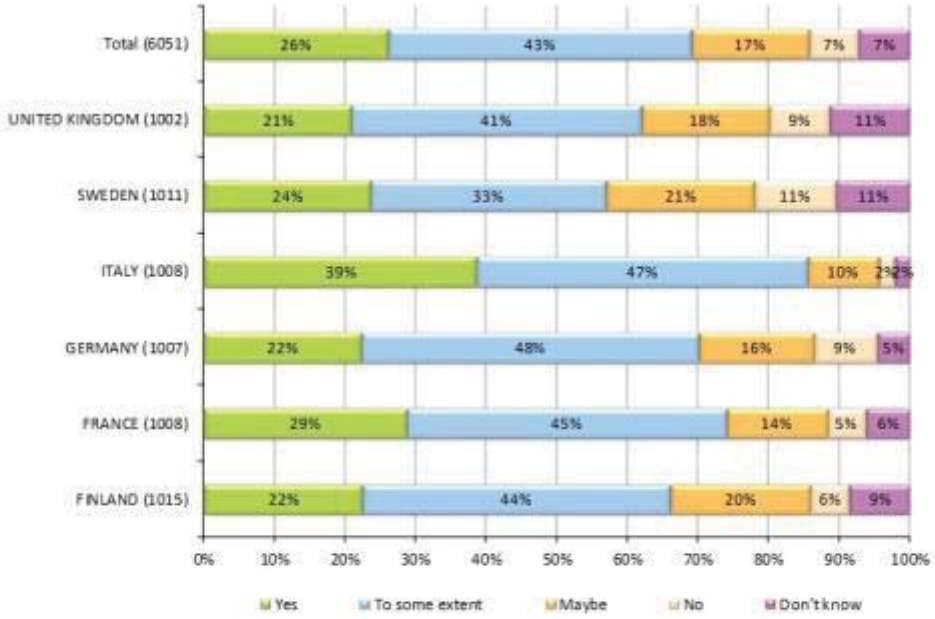
userneeds

To what extent do you have confidence in the information provided by the tyre label?



userneeds

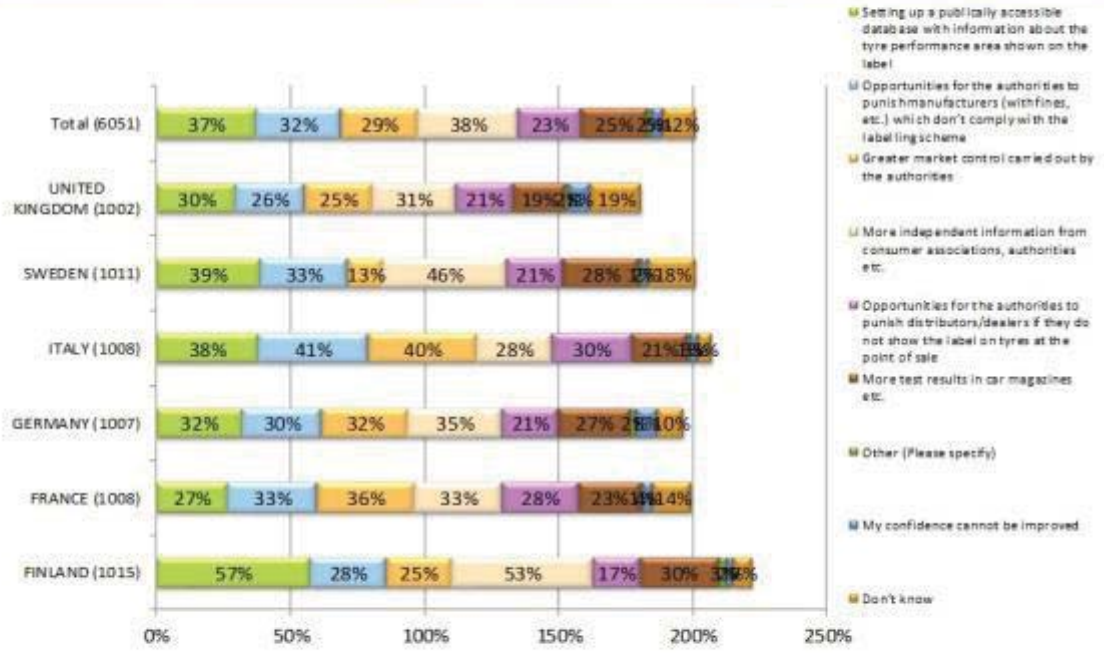
If your confidence in the label were higher, would the label have more influence on your purchase decision?



userneeds

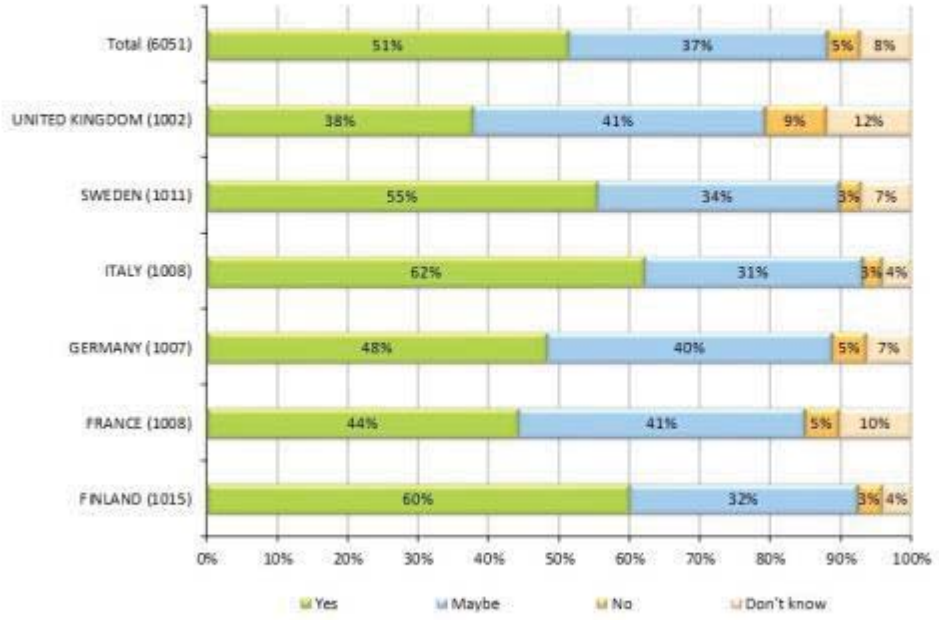
How could your confidence in the labelling scheme be improved?

Please select all those that apply.



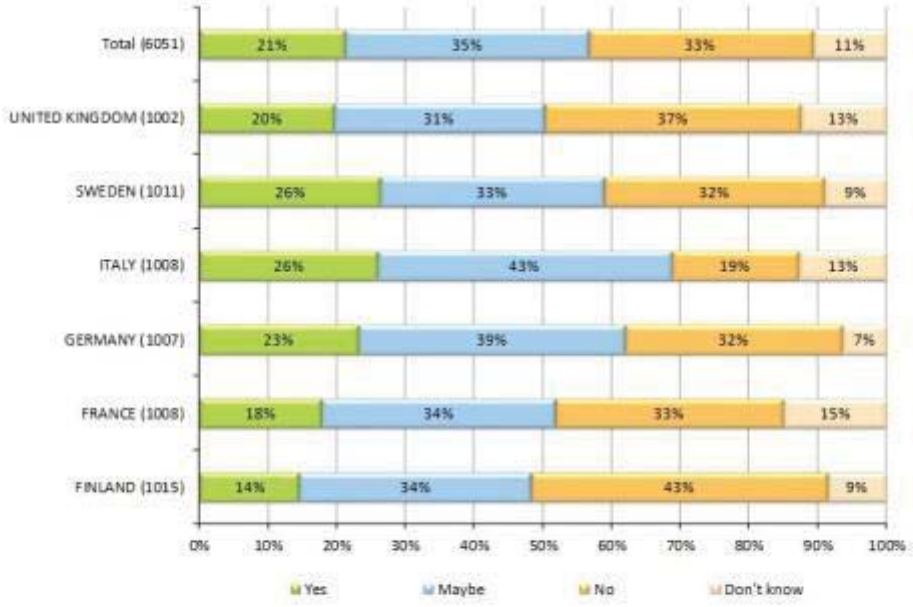
userneeds

If a public database were to be established with information on tyre performance areas shown on the label, would you use the database to search for information when purchasing new tyres in the future?



userneeds

Do you expect to buy tyres on the internet in the future?



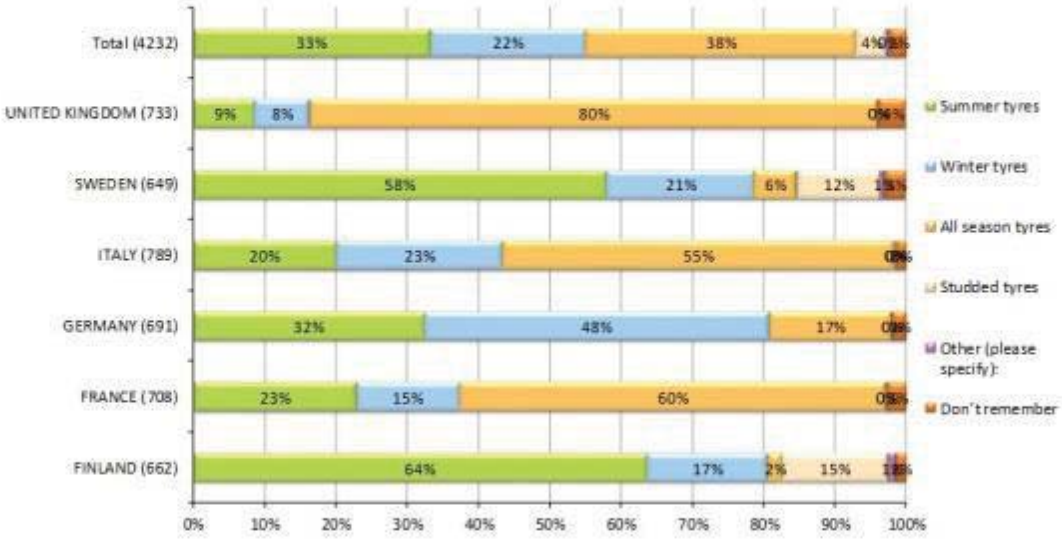
userneeds

Agenda

- Background
- All car owners
- **Buyers of new tyres for passenger car 2013-2015**
- Buyers of new (not used) passenger car 2013-2015

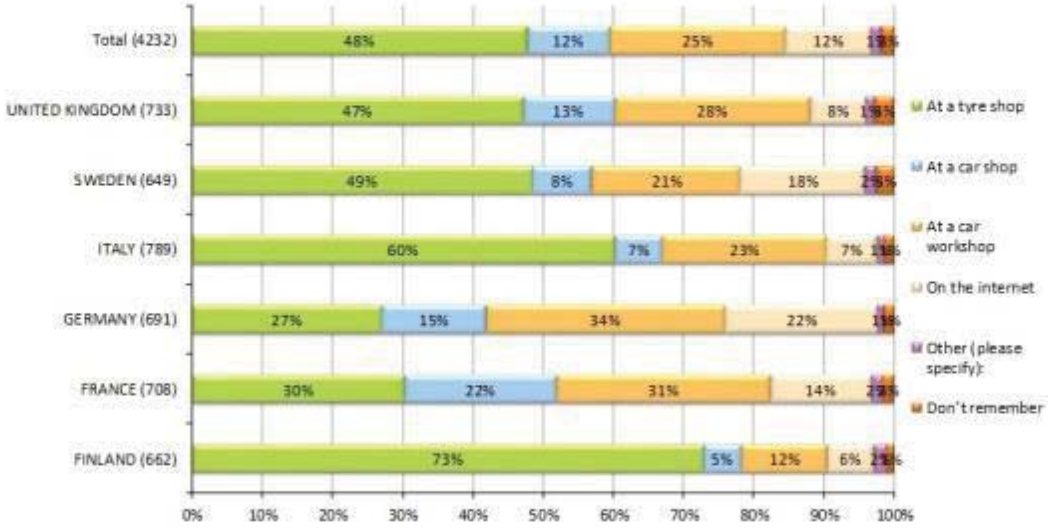
userneeds

What type of tyres did you buy?



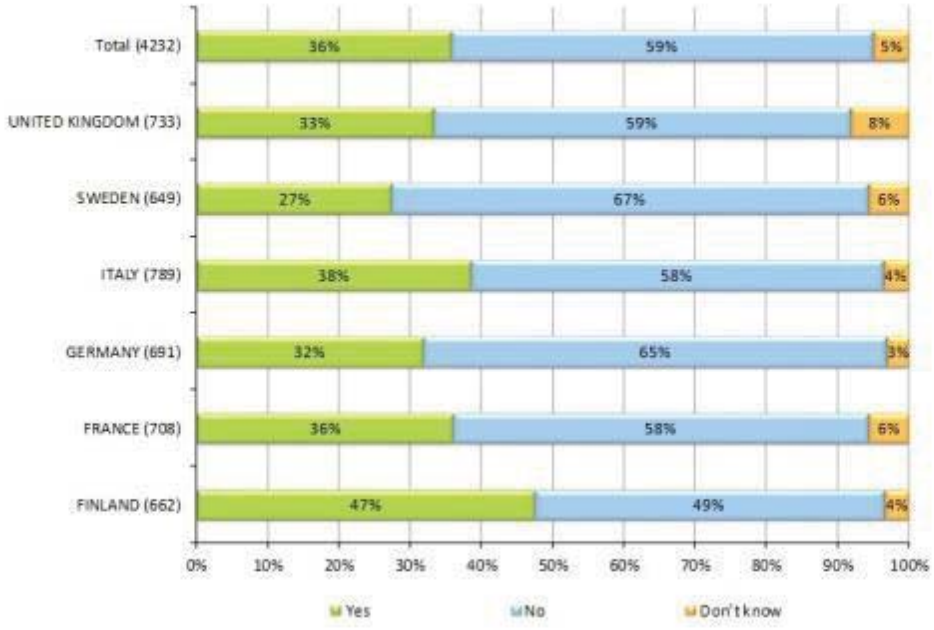
userneeds

Where did you purchase the tyres?



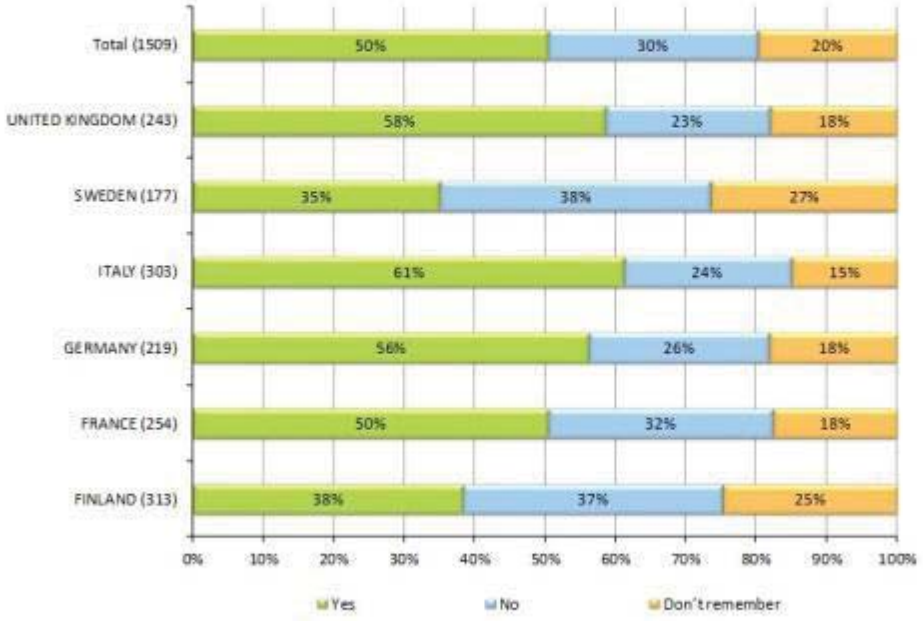
userneeds

Did you see the tyres displayed in a shop before the purchase?



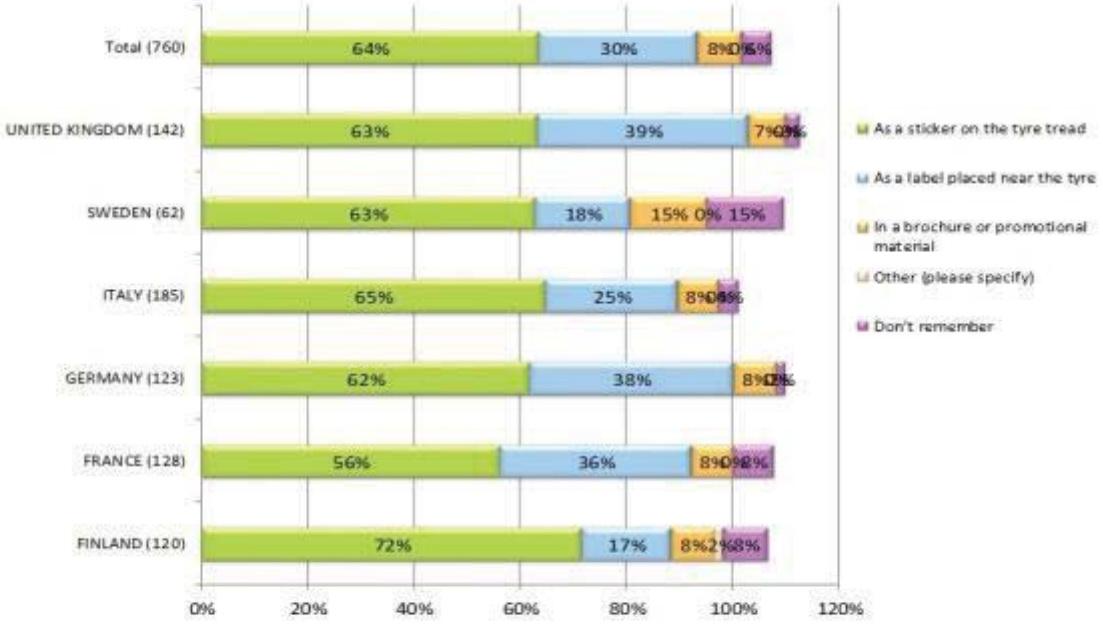
userneeds

Did you notice the tyre label when you were in the shop?



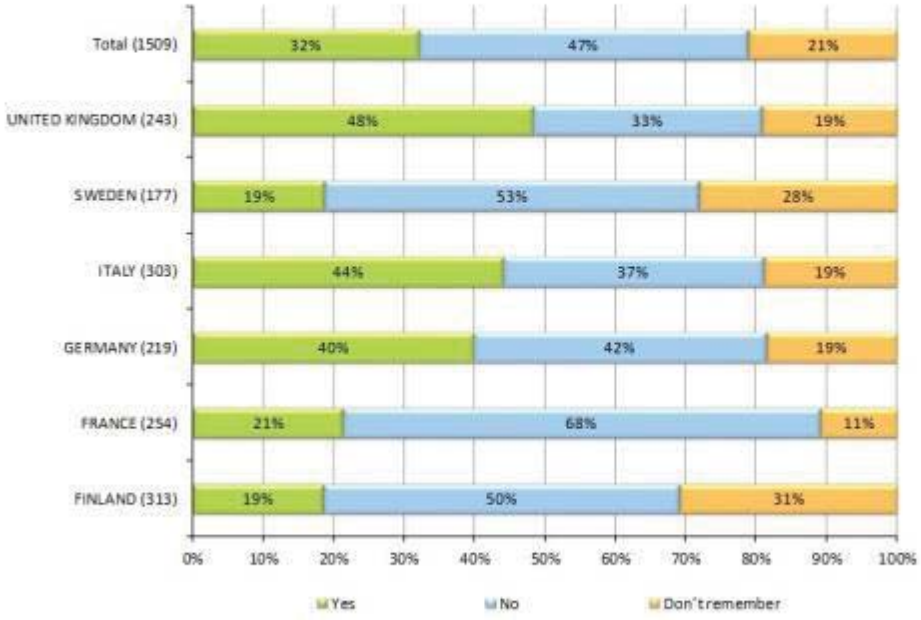
userneeds

Where was the tyre label placed?



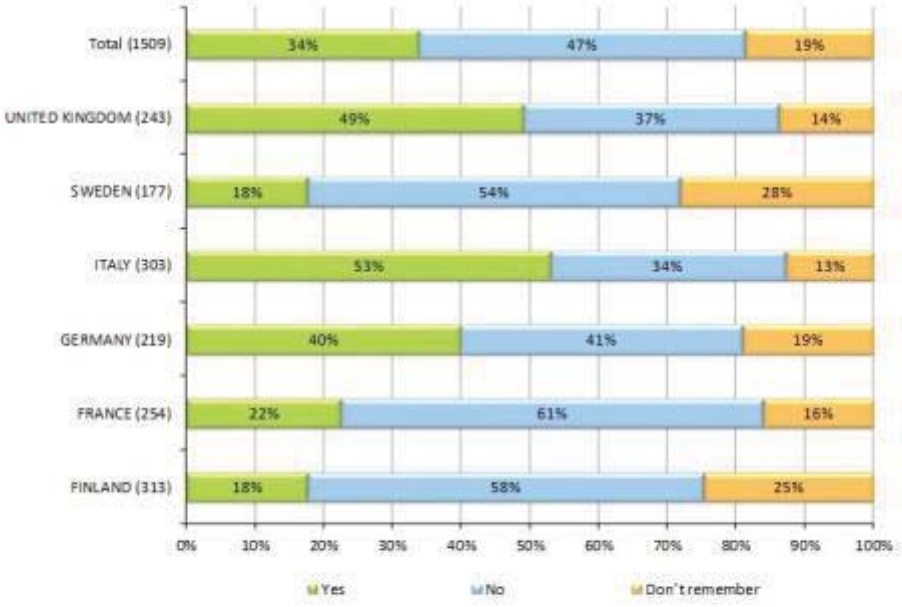
userneeds

Did the seller make you aware of the tyre label?



userneeds

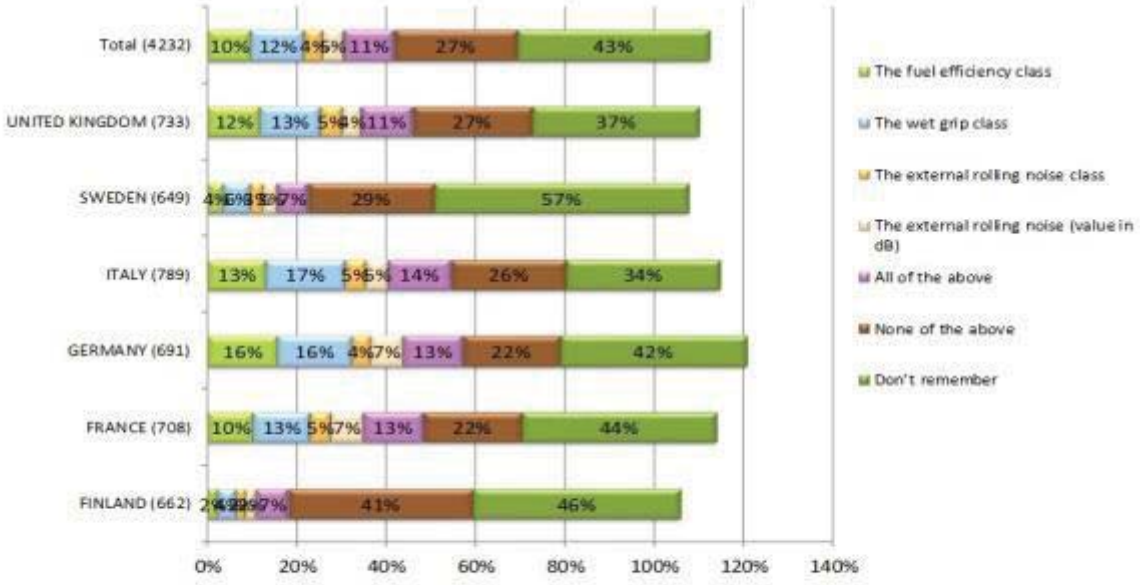
Did you get help from the seller to understand the information on the tyre label?



userneeds

Was any of the following information stated on/with the bill, when you purchased the tyres?

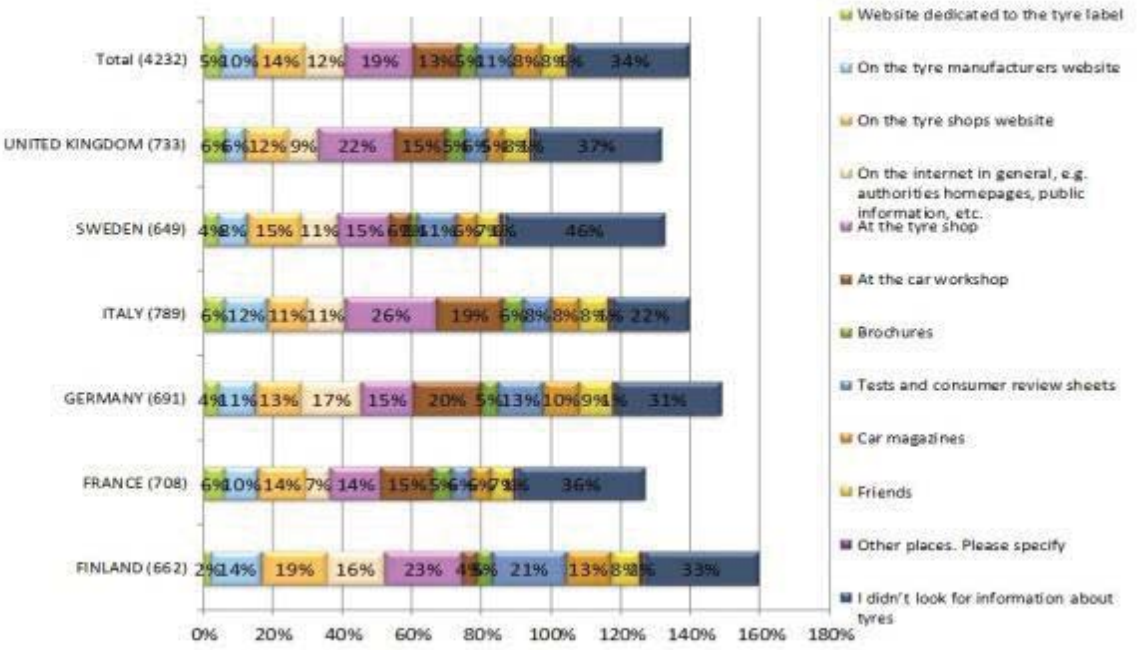
Please select all those that apply



userneeds

Where did you find information about the tyre label before you made your last purchase?

Please select all those that apply



userneeds

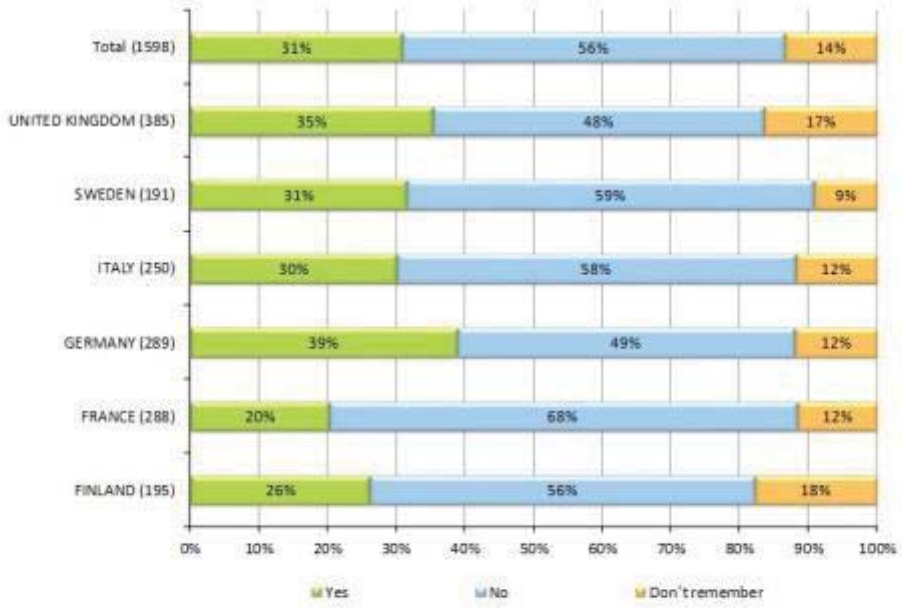
Agenda

- Background
- All car owners
- Buyers of new tyres for passenger car 2013-2015

Buyers of new (not used) passenger car 2013-2015

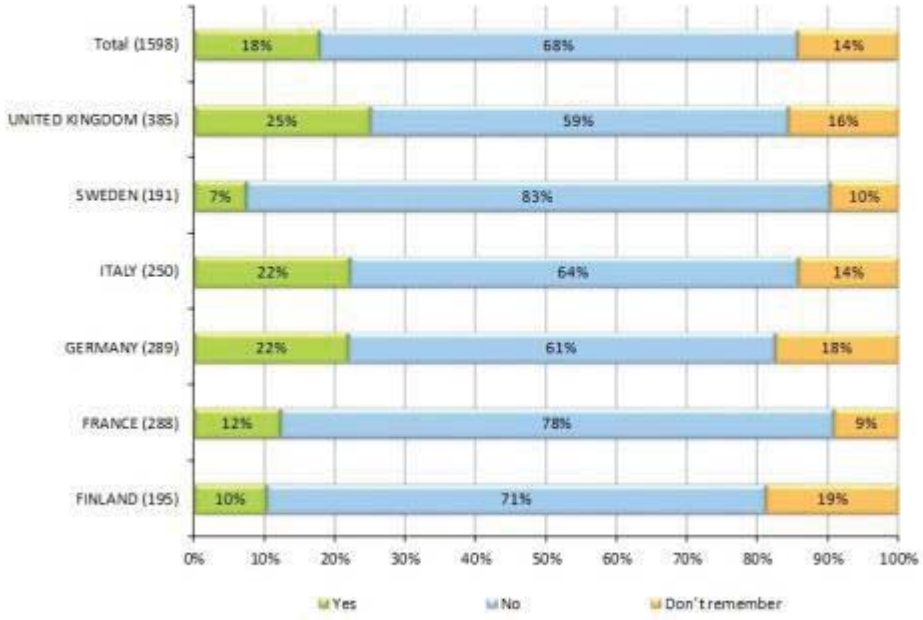
userneeds

At the point of sale (in a shop), were you offered a choice between different types of tyres when you purchased your last new passenger car?



userneeds

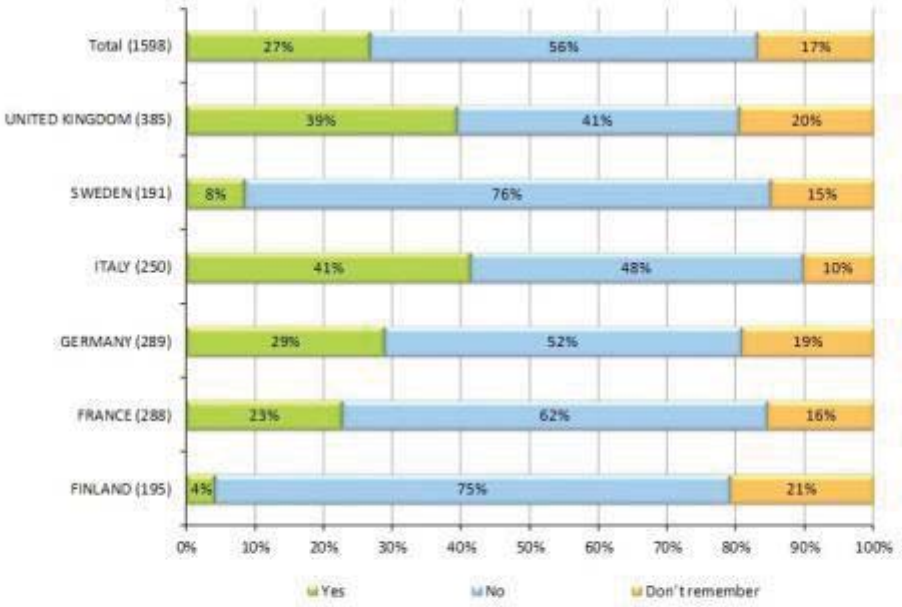
Did the car retailer make you aware of the tyre label before the sale?



userneeds

Before the sale, did the car retailer provide you with information about each of the tyres offered for the following tyre performance areas:

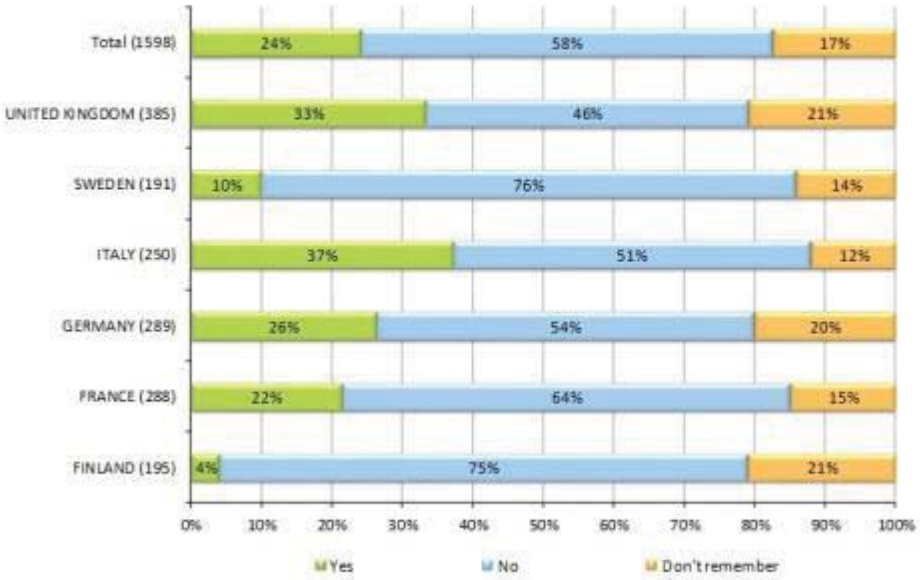
The fuel efficiency class



userneeds

Before the sale, did the car retailer provide you with information about each of the tyres offered for the following tyre performance areas:

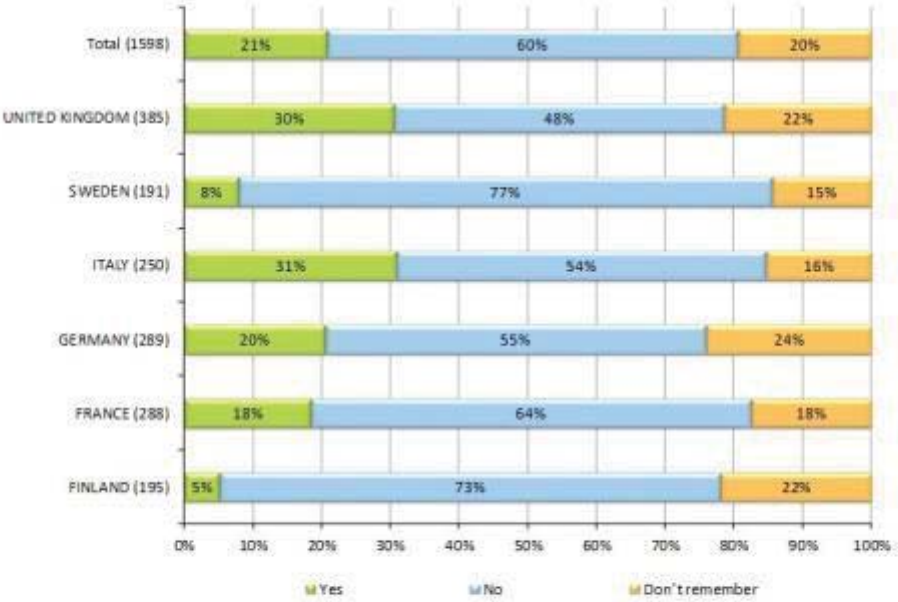
The wet grip class



userneeds

Before the sale, did the car retailer provide you with information about each of the tyres offered for the following tyre performance areas:

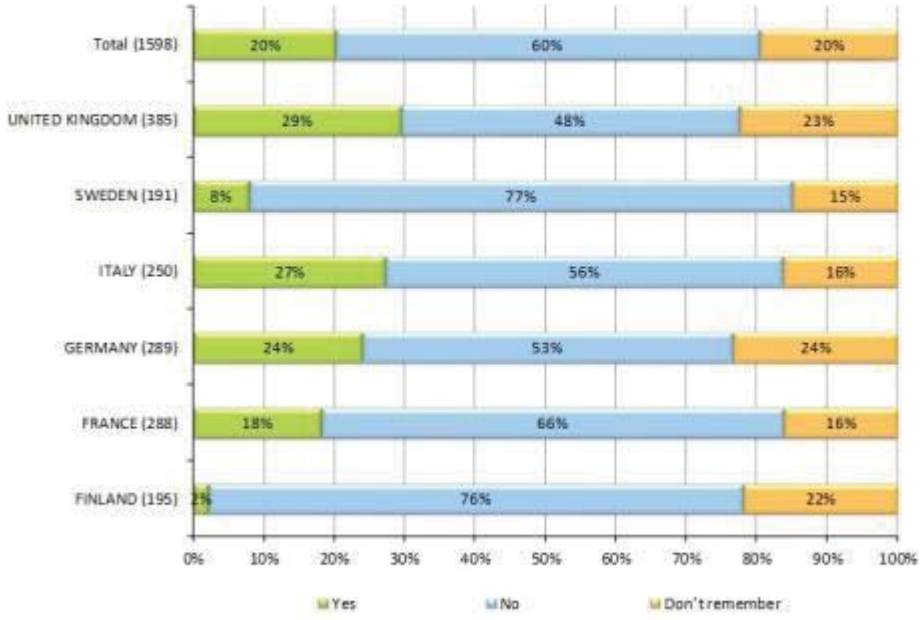
The external rolling noise class



userneeds

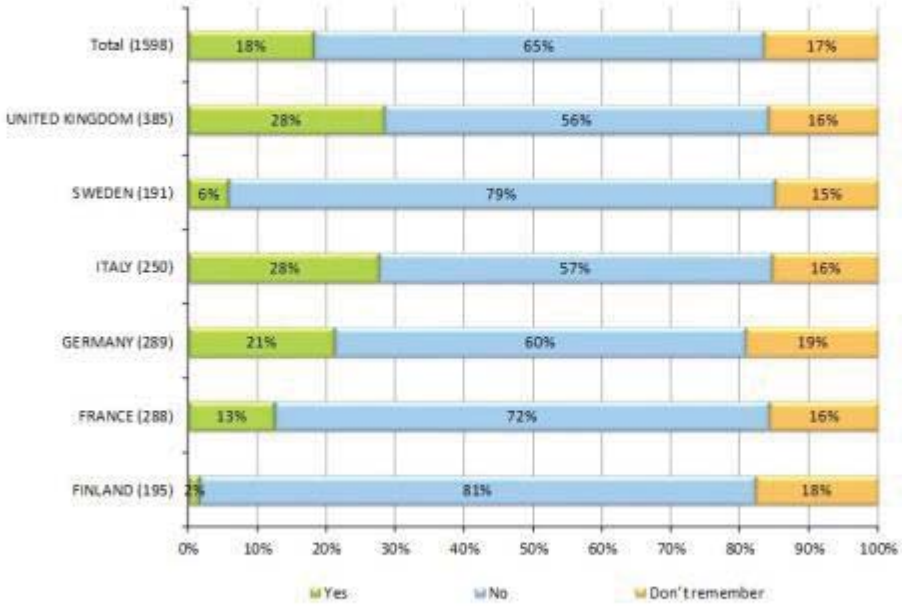
Before the sale, did the car retailer provide you with information about each of the tyres offered for the following tyre performance areas:

External rolling noise (value in dB)



userneeds

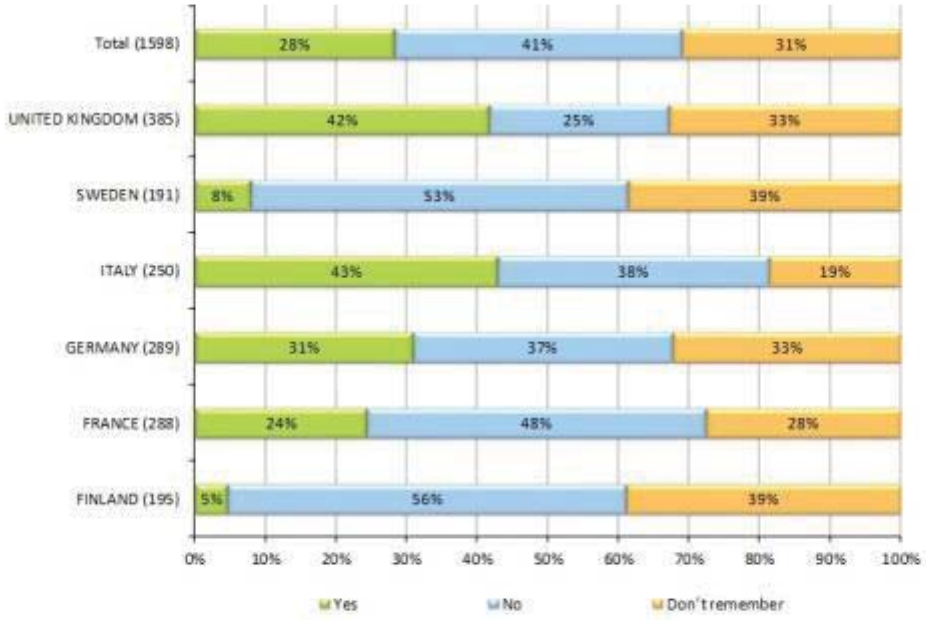
Did you get help from the car retailer to understand the fuel efficiency class, the wet grip class and/or the external rolling noise?



userneeds

Was the following information included in the technical promotional material?

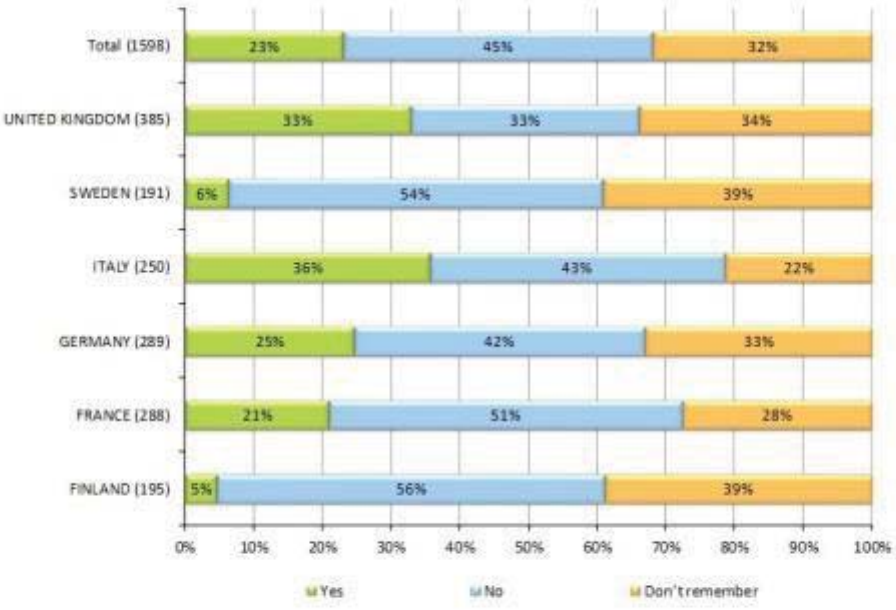
The fuel efficiency class



usermeeds

Was the following information included in the technical promotional material?

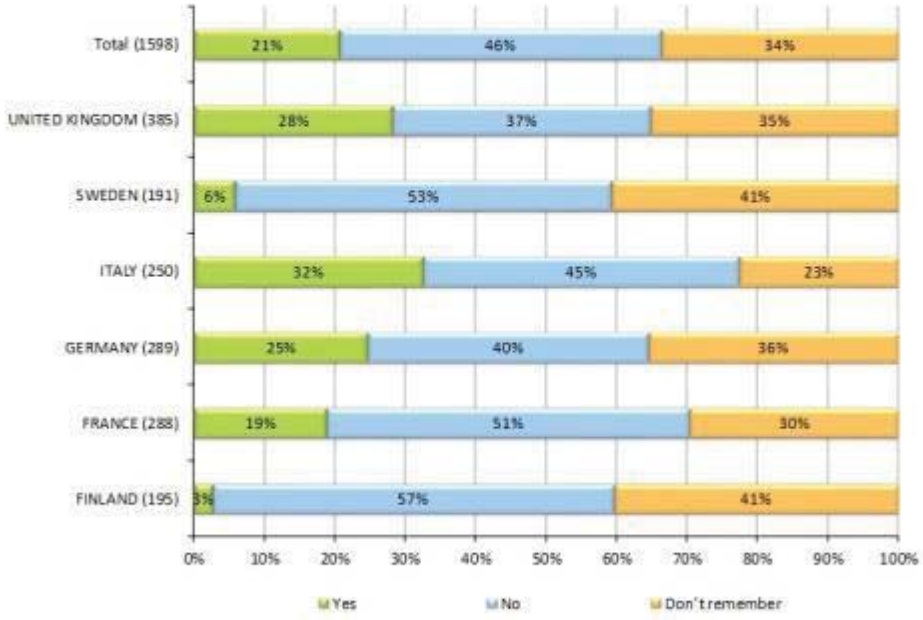
The wet grip class



usermeeds

Was the following information included in the technical promotional material?

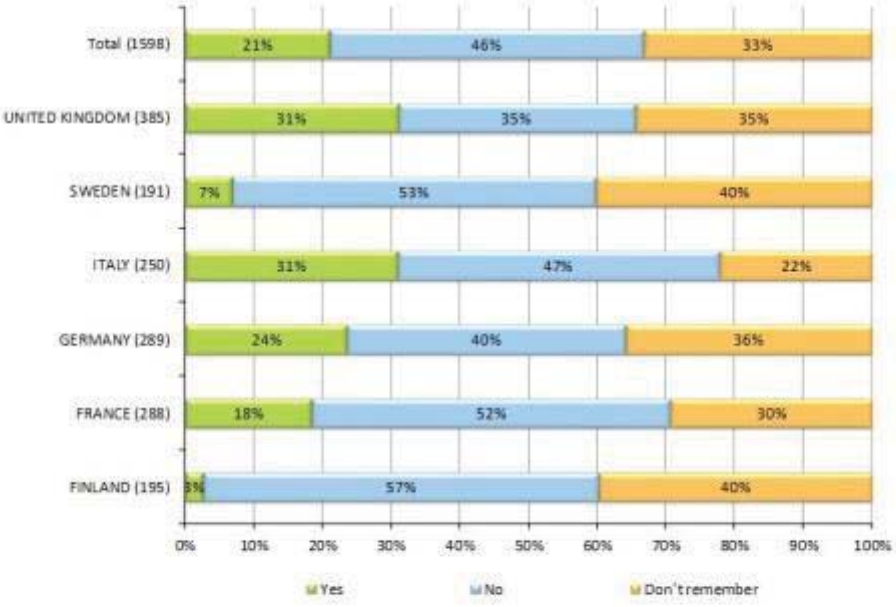
The external rolling noise class



userneeds

Was the following information included in the technical promotional material?

External rolling noise (value in dB)



userneeds

Appendix 2: Methods and analytical models

I. GENERAL ASSUMPTIONS

- The development of RRC and WG are based on expected market shares of each label class in the future, which differs in each scenario.
- C1 vehicle fleet consists of 41% diesel and 59% petrol (ACEA, 2017)
- C2 vehicle fleet consists of 88% diesel and 12% petrol (ACEA, 2017)
- C3 vehicle fleet consist of 96% diesel and 4% petrol (ACEA, 2017)[105]
- C1 vehicles drive 13,500 km per year on average
- C2 vehicles drive 21,000 km per year on average
- C3 vehicles drive 57,500 km per year on average
- EU HICP rates are used to convert all prices to 2017 fixed prices[106]
- Vehicle fleet data was obtained from ACEA: http://www.acea.be/statistics/article/Report-Vehicles-in-Use
- Fuel prices were obtained from: https://www.eea.europa.eu/data-and-maps/indicators/fuel-prices-and-taxes/assessment-7
- Road safety and accident data was obtained from: https://ec.europa.eu/transport/road_safety/specialist/statistics_en#
- Road safety costs was obtained from: https://ec.europa.eu/transport/road_safety/specialist/knowledge/measures/monetary_valuation_of_road_safety_en and http://heatco.ier.uni-stuttgart.de/HEATCO_D5.pdf

- **INFORMATION EFFECT**

The methodology to assess effect of label information on purchase behaviour is based on the article "The Impact of Sustainability Information on Consumer Decision Making"107. In the article over 40,000 online purchases were assessed, and it was found that certain types of sustainability information had a significant impact on purchase intentions. Direct users—those who intentionally sought out sustainability information—were most strongly influenced by sustainability information, with an average purchase intention rate increase of 1.15 percentage points for each point increase in overall product score, reported on a zero to ten scale. However, sustainability information had, on average, no impact on non-direct users.

- Direct users were assumed to be those finding the label parameter analysed "very important" according to the 2016 consumer survey.
    - Find fuel efficiency "very important": 34%
    - Find wet grip "Very important": 62%
    - Find external rolling noise "very important": 21%

105 http://www.acea.be/uploads/statistic_documents/ACEA_Report_Vehicles_in_use-Europe_2017_FINAL2.pdf
106 http://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&language=en&pcode=tec00118&plugin=1
107 Dara O'Rourke and Abraham Ringer, Journal of Industrial Ecology, 2015 "The Impact of Sustainability Information on Consumer Decision Making", link: http://onlinelibrary.wiley.com/doi/10.1111/jiec.12310/abstract

- Also, for each scenario it was considered how many already uses the label in their purchasing decision, and only the additional influenced end-users were assumed to be impacted.

- **STOCK MODEL ASSUMPTION**

Sales figures were received from the industry organisation ETRMA[108] back to 2003 and backed up by sales data from the market research organisation GfK[109]. The sales data are seen in the table below.

Table 63: Tyre sales in million units

Sales in millions	2006	2008	2010	2012	2014	2016	2017
C1 replacement	231.46	224.30	249.72	226.42	236.60	248.10	253.31
C1 OEM	59.09	77.61	74.64	71.12	73.80	79.47	80.06
C2 replacement	25.72	24.92	27.75	25.16	26.29	27.57	28.15
C2 OEM	4.96	7.51	4.98	4.98	5.35	6.68	6.72
C3 replacement	12.76	11.42	11.56	9.61	12.19	13.97	14.88
C3 OEM	3.35	4.74	2.72	3.33	3.20	3.65	3.94
Total	**337.33**	**350.50**	**371.36**	**340.62**	**357.44**	**379.44**	**387.06**

Source: ETRMA and GfK

Average tyre lifespans were based on assumptions regarding the expected tyre life in km and km driven per year for each vehicle type as shown in the table below. The assumptions were primarily based on background data form the Ecodesign Impact Accounting[110].

Table 64: Assumption on tyre lifespans and mileage

Tyre type	Expected life in km	Average distance driven per year, km	Average tyre lifespan, years
C1	56 700	13 500	4.2
C2	71 400	21 000	3.4
C3	200 000	57 500	3.5

Source: Ecodesign Impact Accounting background calculation model, 2017.

Further assumptions used in the stock model:

Table 65: Further assumptions made in the stock model

C1 share out of C1 + C2 sales	90%
Share of C1 OEM	21% of C1 replacement market
Share of C2 OEM	25% of C2 replacement market
Share of C3 OEM	25% of C3 replacement market
Number of tyres per vehicle in stock – C1 (Calculated)	5.7 (approx. 1/3 have two sets of tyres)
Number of tyres per vehicle in stock – C2 (Calculated)	4.1 (approx. 2,5% have two sets of tyres)
Number of tyres per vehicle in stock – C3 (Calculated)	12.7 (different number of wheels on different trucks/busses)

Sources; ETRMA, Ecodesign Impact Accounting

108 http://www.etrma.org/statistics-2
109 http://www.gfk.com/about-gfk/about-gfk/
110https://ec.europa.eu/energy/sites/ener/files/documents/Ecodesign%20Impacts%20Accounting%20%20-%20status%20January%202016%20-%20Final-20160607%20-%20N....pdf

- **BAU SCENARIO ASSUMPTIONS**

- 2008 Impact Assessment No-Label scenario was used as basis for RRC market distribution, however, not all tables added up to 100% market. These have been adjusted.
- For C3 an entirely new market distribution had to be estimated for the BAU scenario, since the 2008 IA was unrealistically low compared to actual market data.
- The three tables below show the percentage market shares assumed for each tyre type (C1, C2, C3):

Table 66: BAU Rolling resistance market shares for C1 tyres

RRC bands	6 to 7	7 to 8	8 to 9	9 to 10	10 to 11	11 to 12	Above 12	Market average
Band average	6.5	7.5	8.5	9.5	10.5	11.5	13.3	
2004	0%	0%	1%	4%	12%	24%	60%	**12.30**
2012	0%	1%	6%	5%	16%	29%	43%	**11.79**
2013	0%	1%	7%	6%	19%	37%	30%	**11.48**
2014	0%	1%	8%	7%	22%	43%	19%	**11.20**
2015	0%	1%	9%	8%	27%	55%		**10.76**
2016	0%	1%	9%	8%	28%	54%		**10.75**
2017	0%	1%	11%	12%	40%	36%		**10.49**

Source: 2008 Impact Assessment

Table 67: BAU Rolling resistance market shares for C2 tyres

RRC bands	5.5 - 6.5	6.5 - 7.5	7.5 - 8.5	8.5 - 9.5	9.5 - 10.5	above 10.5	Market average
Band average	6	7	8	9	10	11.75	
2004	0%	0%	3%	11%	26%	61%	**10.68**
2013	0%	1%	4%	18%	42%	35%	**10.30**
2014	0%	1%	4%	21%	50%	23%	**10.06**
2015	0%	1%	6%	27%	67%		**9.60**
2016	0%	1%	6%	27%	67%		**9.60**
2017	0%	1%	8%	46%	45%		**9.35**

Source: 2008 Impact Assessment

Table 68: BAU Estimated rolling resistance market shares for C3 tyres

RRC bands	Below 4	4 to 5	5 to 6	6 to7	7 to 8	Above 8	Market Average
Band average	3.7	4.5	5.5	6.5	7.5	9.8	
2004	0%	0%	3%	28%	33%	38%	**7.81**
2013	0%	2%	5%	34%	26%	34%	**7.78**
2014	0%	2%	5%	35%	29%	29%	**7.67**
2015	0%	2%	5%	36%	58%		**6.99**
2016	0%	3%	6%	37%	54%		**6.93**
2017	0%	3%	6%	45%	46%		**6.85**

Source: Viegand Maagøe, estimates based on real-life market data

- Wet grip was only given in the 2008 Impact Assessment for C1 superficially.
- The market distribution of wet grip classes in the BAU Scenario for the three tyre types (C1, C2, C3) therefore had to be estimated by extrapolating form real-life market data.
- The estimated market shares are shown in the three tables below.
-

Table 69: BAU Wet grip market shares for C1 tyres

Wet grip classes	A	B	C	E	F	Market average
Class average, C1	1.6	1.47	1.32	1.17	1.0	
2012	1%	3%	15%	30%	51%	**1.12**
2017	1%	4%	19%	35%	41%	**1.15**

Source: estimated based on 2008 Impact Assessment and real-life data (with label)

Table 70: BAU Estimated wet grip market shares for C2 tyres

Wet grip classes	A	B	C	E	F	Market average
Class average, C2	1.45	1.32	1.17	1.02	0.9	
2012	1%	3%	15%	30%	51%	**0.99**
2017	1%	4%	18%	32%	45%	**1.01**

Source: estimated based on 2008 Impact Assessment and real-life data (with label)

Table 71: BAU Estimated wet grip market shares for C3 tyres

Wet grip classes	A	B	C	D	E	F	Market average
Class average, C3	1.3	1.17	1.02	0.87	0.72	0.6	
2012	1%	3%	15%	15%	15%	51%	**0.75**
2017	1%	4%	18%	18%	19%	40%	**0.78**

Source: estimated based on 2008 Impact Assessment and real-life data (with label)

The Noise level was given in the 2008 Impact Assessment, but TOL had data available for the market distribution as far back as 2008, which was used as basis for the BAU noise level for each tyre type (C1, C2, C3). A very limited development in average noise was expected in the BAU scenario until 2017. The 2008 data and the 2017 estimated value are shown in the table below:

Table 72: average noise level in BAU scenario

	2008 average noise, dB	**2017 average noise, dB**
C1	71.20	71.05
C2	72.51	72.35
C3	72.00	71.85

Source: 2008 TOL data and 2017 estimated

- **CURRENT LABELLING SCENARIO MODEL**

Only tyres sold on the replacement market, i.e. to replace tyres on a vehicle already in use, are expected to be affected by the label Regulation. This assumption was made for the following reasons:

- It is not mandatory to always show the tyre label for tyres sold with new vehicles, but only if the end-user is offered a choice between different tyres.
- The 2016 consumer survey showed that less than 5.6% of end-users were offered a choice and were shown the label information for different tyres when purchasing a new vehicle
- The tyres are not expected to be the primary focus of end-users when purchasing a new vehicle, but rather the car itself is important.

The entire energy consumption of all tyres (including OEM tyres) are included in the modelling, but only the replacement tyres are expected to change significantly in terms of the performance parameters on the label.

The following data and assumptions were used in the modelling of the current labelling scenario:

- The OEM performance level for RRC, WG and Noise was assumed equal to the BAU performance levels, i.e. only the replacement tyres are affected by the label
- Before 2012: Linear interpolation from 2008 Impact Assessment estimated performance in 2004.
- All performance parameters (for all tyres) are assumed to follow the BAU scenario until 2009, from when linear interpolation is made to 2012, where real-life market data is available.
- 2012-2017 based on real-life data from TOL (<1% difference from GfK data) giving market distributions for rolling resistance, wet grip and noise (see tables below)

The 2016 Review Study showed low degree of market surveillance, and the few tests that have been performed show a high rate of non-compliance. This low compliance rate is taken into account in the BAU Scenario, but since no actual EU-wide non-compliance rates are available, the following assumptions have been made:

- 10% of tyres on the market does not live up to the performance appearing on their label.
- The non-compliant tyres are assumed to be on average **3 classes lower** than stated on the label.

Table 73: Current label Rolling resistance market shares for C1 tyres

RRC class	A	B	C	E	F	G	Market average	**Market average with non-compliance**
Class average	6.3	7.4	8.7	10	11.5	12.4		
2012	0%	3%	29%	42%	24%	1%	9.92	**10.28**
2013	1%	6%	36%	39%	17%	1%	9.64	**10.01**
2014	0%	5%	36%	43%	15%	1%	9.63	**10.00**
2015	0%	5%	38%	42%	14%	0%	9.57	**9.93**
2016	0%	5%	34%	43%	17%	1%	9.68	**10.05**
2017	0%	6%	37%	42%	15%	1%	9.59	**9.96**

Source: Data from TOL (Tyres On-Line, Germany).

Table 74: Current label Rolling resistance market shares for C2 tyres

RRC class	A	B	C	E	F	G	Market average	**Market average with non-compliance**
Class average	5.3	6.4	7.7	8.9	10.2	10.8		
2012	0%	1%	26%	56%	15%	2%	8.80	**9.13**
2013	0%	4%	20%	44%	28%	3%	8.97	**9.30**
2014	0%	6%	25%	41%	25%	2%	8.82	**9.15**
2015	0%	5%	29%	40%	24%	1%	8.77	**9.10**
2016	0%	4%	25%	42%	27%	3%	8.92	**9.25**
2017	0%	4%	28%	41%	25%	2%	8.83	**9.16**

Source: Data from TOL (Tyres On-Line, Germany).

Table 75: Current label Rolling resistance market shares for C3 tyres

RRC class	A	B	C	D	E	F	Market average	**Market average with non-compliance**
Class average	3.8	4.7	5.7	6.7	7.7	8.6		
2012	2%	10%	33%	37%	16%	3%	6.07	**6.43**
2013	2%	11%	33%	37%	15%	2%	6.34	**6.70**
2014	1%	10%	36%	36%	14%	2%	6.30	**6.66**
2015	1%	7%	29%	38%	20%	5%	6.28	**6.64**
2016	1%	7%	29%	40%	18%	4%	6.54	**6.90**
2017	0%	16%	44%	26%	13%	1%	6.50	**6.86**

Source: Data from TOL (Tyres On-Line, Germany).

Table 76: Current label Wet grip market shares for C1 tyres

Wet grip class	A	B	C	E	F	Market average	**Market average with non-compliance**
Class average	1.6	1.47	1.32	1.17	1.04		
2012	10%	27%	61%	9%	3%	1.36	**1.32**
2013	18%	37%	52%	8%	3%	1.39	**1.35**
2014	21%	37%	52%	8%	3%	1.40	**1.35**
2015	23%	40%	50%	8%	1%	1.41	**1.36**
2016	21%	38%	49%	11%	3%	1.40	**1.35**
2017	26%	41%	48%	9%	3%	1.41	**1.36**

Source: Data from TOL (Tyres On-Line, Germany).

Table 77: Current label Wet grip market shares for C2 tyres

Wet grip class	A	B	C	E	F	Market average	**Market average with non-compliance**
Class average	1.45	1.32	1.17	1.02	0.9		
2012	2%	29%	61%	8%	1%	1.21	**1.16**
2013	3%	27%	56%	13%	1%	1.20	**1.15**
2014	5%	31%	49%	15%	1%	1.21	**1.16**
2015	6%	32%	45%	17%	0%	1.21	**1.16**
2016	6%	30%	43%	20%	1%	1.20	**1.16**
2017	8%	34%	38%	18%	1%	1.22	**1.17**

Source: Data from TOL (Tyres On-Line, Germany).

Table 78: Current label Wet grip market shares for C3 tyres

Wet grip class	A	B	C	D	E	Market average	**Market average with non-compliance**
Class average	1.3	1.14	1	0.85	0.7		
2012	11%	65%	21%	3%	0%	1.12	**1.07**
2013	4%	46%	47%	2%	0%	1.07	**1.03**
2014	5%	47%	45%	3%	0%	1.08	**1.03**
2015	6%	53%	38%	3%	0%	1.09	**1.04**
2016	2%	39%	54%	4%	0%	1.06	**1.01**
2017	3%	42%	51%	4%	0%	1.06	**1.02**

Source: Data from TOL (Tyres On-Line, Germany).

Table 79: Average market noise levels in Current label scenario

Year	C1	C2	C3
2012	70.81	71.93	71.78
2013	70.67	71.98	72.19
2014	70.86	72.07	72.05
2015	70.80	72.03	71.71
2016	70.84	72.15	71.71
2017	70.73	71.97	71.69

Source: Data from TOL (Tyres On-Line, Germany).

- **EFFECT OF ROLLING RESISTANCE ON FUEL CONSUMPTION**
- Based on the calculations form the official "fuel savings calculator" [111]
- Fuel savings calculator is based on measurements performed by IDIADA for the European Commission[112]

111 https://ec.europa.eu/energy/en/topics/energy-efficiency/energy-efficient-products/tyres

- In the calculations a share of 50% urban driving and 50% non-urban driving was assumed

The following formula correlating fuels savings (in %) and change in rolling resistance forms the basis of the fuel savings calculator, and is the one used in this study:

$$Fuel\ consumption\ change\ (\%) = K * \frac{RRC_{old} - RRC_{new}}{RRC_{old}} * 100\%$$

Where RRC_{old} in this case refers to BAU1 (actual data), RRC_{new} refers to BAU0 rolling resistance and K is a factor calculated by IDIADA based on actual measurements of cars driven on a test lane with different tyres. The K factor depends on type of tyre (and thus vehicle), the share of urban and non-urban driving and whether the rolling resistance is increasing or decreasing. K-factors are shown in Table 22. In the scenario calculations 50/50 share of urban and non-urban driving was assumed.

Table 80: K-factors used in calculation of fuel consumption from RRC development

RRC development	Road type	C1	C2	C3
Increase in RRC	Urban	0.104	0.098	0.095
	Non-urban	0.158	0.118	0.112
	Average (50/50)	0.131	0.108	0.1035
Decrease in RRC	Urban	0.145	0.109	0.106
	Non-urban	0.183	0.125	0.118
	Average (50/50)	0.164	0.117	0.112

Source: IDIADA background report on the fuel savings calculator

- **EFFECT OF WET GRIP ON SAFETY**

The societal costs related to a change in tyre wet grip rating have been estimated using a methodology from a 2014 study by TNO on Potentials benefits of Triple-A tyres in the Netherlands[113]. The general approach is shown in the figure below. It shows a relation between the grip level of the tyre, the braking distance and the resulting impact speed of an accident. The degree of personal injury (fatal, severe, slight) can be described as a function of impact speed and accordingly the distribution between fatal, severe and slightly injured people can be translated into societal costs.

112 http://www.applusidiada.com/en/aboutUs/inbrief
113 TNO

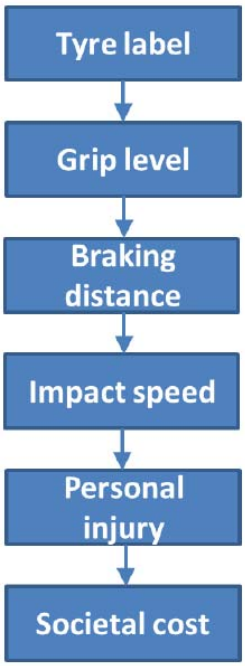


Figure 24 Methodology flow diagram[114]

Data and assumptions

- Data has been gathered through a number of sources but are all based on data from the CARE database - **C**ommunity database on **A**ccidents on the **R**oads in **E**urope. Direct sources are referenced in footnote when relevant.
- Road accident fatalities[115] are divided into mode of transportation:
    - Passenger cars (C1 tyres)
    - Lorries <3.5 tons (C2 tyres)
    - Heavy goods vehicles >3.5 tons (C3 tyres)
    - Buses (C3 tyres)
    - Pedestrians and bicycles (assumed to be inflicted by vehicles)
- Number of injuries is not distributed on mode of transportation[116] and is therefore assumed to be the same as for fatalities. The distribution between severe and slight injuries are based on rough estimates[117]:
    - 19% Severely injured
    - 81% slightly injured
- It is assumed that improved wet grip only affects accident on wet road. The share of accidents on wet road was 9%[118] in 2015. The share is assumed to be constant through the whole modelling period.
- The distribution of accidents by road type are divided into the following based on 2015 numbers[119]:
    - Urban – 37,3%
    - Rural – 55,0%

114 TNO
115 https://ec.europa.eu/transport/road_safety/sites/roadsafety/files/pdf/statistics/dacota/asr2017.pdf
116 https://ec.europa.eu/transport/road_safety/sites/roadsafety/files/pdf/observatory/historical_evol.pdf
117 https://ec.europa.eu/transport/road_safety/specialist/statistics_en#
118 https://ec.europa.eu/transport/road_safety/sites/roadsafety/files/pdf/statistics/dacota/asr2017.pdf
119 https://ec.europa.eu/transport/road_safety/sites/roadsafety/files/pdf/statistics/dacota/asr2017.pdf

- Motorway – 7,8%
- The distribution is assumed to be the same through the whole modelling period.

- Projections of fatalities and injuries in the baseline up to 2030 are based on historic trends.

Wet grip

Wet grip refers to the capacity of a tyre to brake on a wet road. The wet grip is applicable to all tyre types (C1, C2, C3), and is determined based on the wet grip index (G) according to the A-G scale specified in Table 23**Table 25**. The value of the wet grip index should be calculated based on either the average deceleration in m/s^2 or the peak brake force coefficient, which is unit-less, and compared to a Standard Reference Test Tyre (SRTT).

Table 81: G limit values for wet grip scales of the three tyre types C1, C2 and C3

C1 tyres		**C2 tyres**		**C3 tyres**	
G	Wet grip class	G	Wet grip class	G	Wet grip class
1,55 ≤ G	A	1,40 ≤ G	A	1,25 ≤ G	A
1,40 ≤G ≤ 1,54	B	1,25 ≤ G ≤ 1,39	B	1,10 ≤ G ≤ 1,24	B
1,25 ≤ G ≤ 1,39	C	1,10 ≤ G ≤ 1,24	C	0,95 ≤ G ≤ 1,09	C
Empty	D	Empty	D	0,8 ≤ G ≤ 0,94	D
1,10 ≤ G ≤ 1,24	E	0,95 ≤ G ≤ 1,09	E	0,65 ≤ G ≤ 0,79	E
G ≤ 1,09	F	G ≤ 0,94	F	G ≤ 0,64	F

Regulation 661/2009 sets out minimum wet grip requirements for C1 tyres only. For normal tyres the limit value is ≥1.1.

Braking distance

There is a clear relation between wet grip level and braking distance as seen in the table below. E.g. wet grip level F has a 55% longer braking distance than wet grip level A. To simplify the calculations a linear trend has been assumed making it possible to calculate the change in braking distance as a function of wet grip index (G). The ratio is assumed equal for all three tyre types (C1, C2, C3), but will of course vary due to different wet grip intervals.

Table 82: Braking distance for different wet grip levels compared to rating A. Assumed equal for C1, C2 and C3 tyres.

Tyre label	Increased braking distance (index)
A	**100**
B	**111**
C	**124**
D	**132**
E	**141**
F	**155**

Impact speed

The TNO study acquired data on the average impact speed for accidents at three different road types: urban, rural and motorway as seen in the table below. This data is assumed to be the reference in the baseline scenario.

Table 83 Average initial vehicle speed and impact speed of different accident scenarios

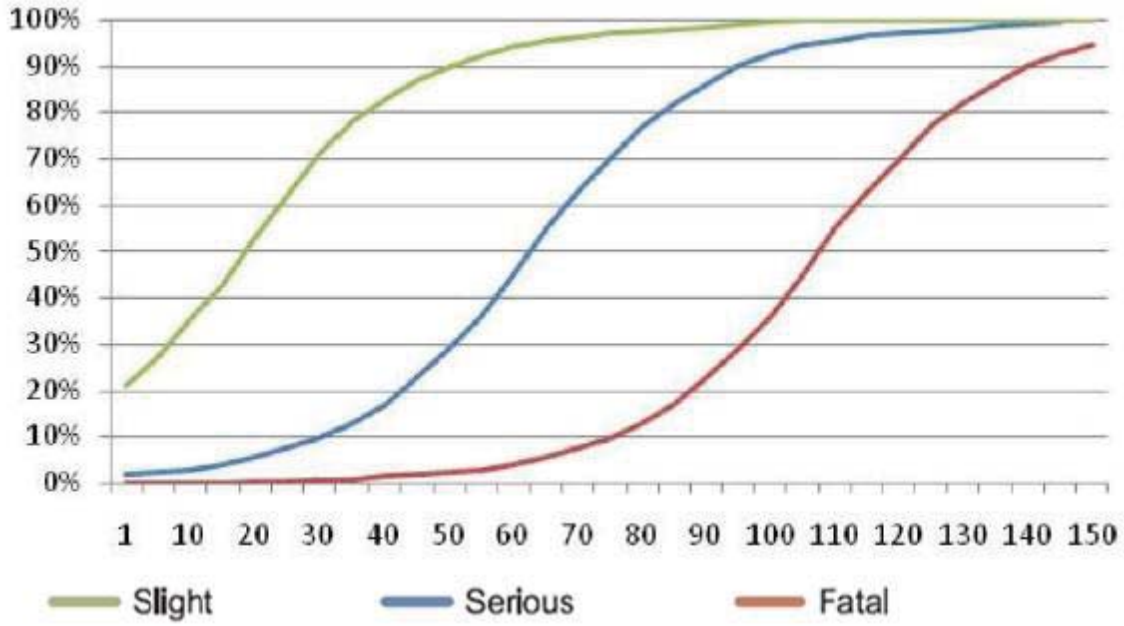
Accident scenario	Urban road car to car	Rural road car to car	Motorway car to car
Initial speed (km/h)	50	80	120
Impact speed (km/h)	30	46	91

For simplification it is assumed that a change in braking length will give an equal change in impact speed. E.g. a 10% reduction in braking length will reduce the impact speed in an accident by 10%. In reality, the relation between braking distance and impact speed will have an exponential trend and will vary depending on the initial speed.

Personal injury

The impact speed can be translated into injury risk for different levels of injuries (slight, serious, fatal) as seen in the figure below. The higher the impact speed the higher is the risk of a fatal accident.

Figure 25 Injury risk of passenger car occupants as a function of impact speed (km/h)[120]



Based on the average accident impact speed the distribution of injury types has been calculated in the table below. This is the baseline injury distribution. Since this is a theoretic distribution it is only used to determine the relative change for the three injury types between the baseline and each scenario. When the relative change has been calculated it can be coupled with the absolute number of fatalities, seriously injured and slightly injured in the baseline.

120 TNO study

Table 84 Baseline distribution of injury types based on average accident impact speeds for different road types

Road type	Impact speed (km/h)	Fatalities	Serious injuries	Slight injuries	No injury
Urban	30	1.6%	7.1%	63.4%	27.9%
Rural	46	1.8%	22.7%	62.8%	12.7%
Motorway	91	23.7%	61.2%	13.8%	1.4%

- **SOCIETAL COSTS**

The estimation of societal costs of accidents is based on values from the 2006 HEATCO report[121] recommended by the Commission for monetary valuation of road safety. It includes estimates for three different injury types – fatal, severe and slight – for individual countries in the EU-25. The values vary greatly between Member States and correlate to the GDP of the Member State. The valuation of the three remaining Member States has therefore been estimated based on GDP. The modelling approach uses a weighted average cost value for each injury type covering the whole of EU-28. The number of fatalities and injuries for each Member State have been used as weighting factors.

Values given in the HEATCO report are 2002 prices and have therefore been converted to the current price level based on the inflation rate (see Table 27).

Table 85 Societal costs based on injury types[122]

Injury type	**Societal costs thousand EUR (2017)**
Fatal	1,673
Severe	251
Slight	19

- **ECONOMY AND EMPLOYMENT**

The industry turnover has been used as a measure of economic impact and used to quantify employment changes within the industry.

Turnover and employment have been divided into three sectors:

- Manufacturer
- Wholesale
- Retail

Manufacturer

Data for manufacturer turnover has been acquired from EUROSTAT[123] for 2012-2016 (see Table 28). Data for number of employees are from ETRMA[124], which has been upscaled to EU-28 based on ETRMA's market share.

[121] Developing Harmonised European Approaches for Transport Costing and Project Assessment - http://heatco.ier.uni-stuttgart.de/HEATCO_D5.pdf
[122] Converted to 2017 price level - Developing Harmonised European Approaches for Transport Costing and Project Assessment - http://heatco.ier.uni-stuttgart.de/HEATCO_D5.pdf

Table 86 Turnover and employees - tyre manufacturers

Year	Turnover million EUR	Employees	Turnover/ employee EUR
2012	17,634	257,434	68,501
2013	16,800	258,440	65,007
2014	16,813	260,124	64,635
2015	16,801	272,018	61,764
2016	16,836	281,839	59,738
Avg.	**16,977**	**265,971**	**63,929**

The average turnover of 63,929 EUR/employee has been fixed throughout the whole modelling period and therefore assumed to be constant. Similar the mark-up factor relative to the retail turnover, calculated to an average of 2, is assumed constant through the whole modelling period.

Wholesale

It was not possible to acquire data for either turnover or employment for the tyre wholesale sector. Instead estimates on turnover are based on a suggested mark-up factor of 1.25 relative to manufacturer turnover. Number of employees is calculated based on a labour productivity of 59,241 EUR/employee[125], which is an average for all industries. It is unknown if the tyre wholesale industry deviate from this.

Retail

The yearly retail turnover has been estimated based on tyre prices and total sales numbers. The price of a tyre is determined by its combination of rolling resistance and wet grip category. The general trend is the higher the category the higher the price. Prices for C1, C2 and C3 tyres are seen in the following three tables. C1 and C2 prices are based on total sales numbers and total turnover for five major EU markets[126] giving an accurate estimate of the individual unit prices.[127] Some label class combinations have limited sales which were considered too small to give a representative estimate of the unit price. These have been adjusted based on linear interpolation and marked with a (*) in the tables below.

Similar data were not available for C3 tyres, which were therefore collected through an online web shop[128], giving a relatively low sample size. Results should therefore be considered with care.

123 Sold production, exports and imports (NACE Rev. 2) – Product codes 22111100, 22111355, 22111357
124http://www.etrma.org/uploads/20170912%20-%20Statistics%20booklet%202017%20-%20alternative%20rubber%20section%20FINAL%20web1.pdf and personal correspondence with ETRMA.
125 http://www.eurocommerce.eu/retail-and-wholesale-in-europe/facts-and-figures.aspx
126 Germany, France, UK, Spain, Italy
127 GfK data
128 http://www.daekonline.dk Based on 180 tyre models.

Table 87 Unit price matrix - 2017 EUR – GfK data – C1 tyres. *Identified as an outlier and adjusted

RRC – WG	A	B	C	E	F
A	121.8	92.2			
B	94.6	91.0	86.2		
C	101.4	89.9	86.4	78.1	66.3
E	124.5	96.6	76.0	73.7	73.7*
F	115.0	107.8	63.0	70.7	70.7*
G	80.7	103.3	80.0	61.8	

Table 88 Unit price matrix - 2017 EUR – GfK data – C2 tyres. *Identified as an outlier and adjusted

RRC - WG	A	B	C	E	F
A					
B	140.6	126.8	125.4*	124.6*	123.9
C	119.7	124.4	106.0	104.5	117.1
E	112.1	121.5	94.8	100.4	70.3
F	116.9	114.5	95.1	100.5	100.5*
G	77.1	77.4	81.4*	85.3	

Table 89 Unit price matrix - 2018 EUR – C3 tyres. *Identified as an outlier and adjusted[129]

RRC - WG	A	B	C	D	E
A	581,00*	555,25*	503,72		
B	520,50*	535,81	519,41		382,93
C	505,24	532,66	535,44	506,99	410,08
D	491,38*	477,60	529,07	360,48	368,68
E			546,86		

The division of each label class is too broad to track yearly developments. therefore the modelling is based on the exact rolling resistance coefficient (RRC) and wet grip index for each year. Consequently, unit prices must be subdivided as well, making it possible to identify a certain unit price based on a specific combination of RRC and wet grip index. The relation between label class and RRC/WG can be seen in the tables below. It is assumed the unit price of a specific label class corresponds to the middle of the interval (given in brackets below). To calculate a specific unit price in between label classes a linear interpolation has been applied.

Table 90 Relation between label class, rolling resistance and wet grip – C1 tyres

Label Class	RRC	WG
A	<6.6 (6.3)	>1.54 (1.6)
B	6.6 – 7.7 (7.2)	1.54 – 1.40 (1.47)
C	7.8 – 9.0 (8.4)	1.39 – 1.25 (1.32)
E	9.1 – 10.5 (9.8)	1.24 – 1.10 (1.17)
F	10.6 – 12.0 (11.3)	<1.10 (1.04)
G	>12 (12.4)	

129 http://www.daekonline.dk Based on 180 tyre models.

Table 91 Relation between label class, rolling resistance and wet grip – C2 tyres

Label Class	RRC	WG
A	<5.5 (5.3)	>1.39 (1.45)
B	5.6 – 6.7 (6.2)	1.39 – 1.25 (1.32)
C	6.8 – 8.0 (7.4)	1.24 – 1.1 (1.17)
E	8.1 – 9.2 (8.7)	1.09 – 0.95 (1.02)
F	9.3 – 10.5 (9.9)	<0.95 (0.89)
G	>10.5 (10.8)	

Table 92 Relation between label class, rolling resistance and wet grip – C3 tyres

Label Class	RRC	WG
A	<4.1 (3.8)	>1.24 (1.3)
B	4.1 – 5.0 (4.6)	1.24 – 1.1 (1.17)
C	5.1 – 6.0 (5.6)	1.09 – 0.95 (1.02)
D	6.1 – 7.0 (6.6)	0.94 – 0.8 (0.87)
E	7.1 – 8.0 (7.6)	<0.8 (0.72)
F	>8.0 (8.5)	

The average tyre unit price for a specific year is coupled with annual sales data acquired from ETRMA giving an estimate of the turnover in the retail sector. This is done for all three tyre types C1, C2 and C3. Subsequently, it is possible to calculate market turnovers for the manufacturer and wholesale sector based on estimated mark-up factors seen in the table below. Coupled with productivity data (turnover/employee) seen in the same table, the number of employees is calculated.

Table 93 Labour productivity and mark-up factors used in the modelling

Sector	**Turnover/employee EUR**	**Mark-up factors**
Retail	25.511	2
Wholesale	59.241	1,25
Manufacturer	63.929	1

Annex 6: Results

This annex provides further graphs and tables of the results from the model calculations made by Viegand Maagøe, for which the underlying data and assumptions are presented in Annex 4.

1. List of policy options, including modified policy option

Short name	Description
BAU	Baseline – Business as usual. How the market would develop without changing the current regulation
PO2	Policy Option 2. Non-legislative measures only
PO3	Policy Option 3. Legislative amendments
PO3B	As policy option 3, but without the effect of rescaling the label classes
PO3C	As policy option 3, but without the effect of third-party independent testing
PO3D	As policy option 3, but without the effect of online labelling
PO3E	As policy option 3, but without the effect of the Digital Registration database
PO3F	As policy option 3, but without the effect of mandatory labelling of OEM tyres
PO4	Policy Option 4: Option 2 + Option 3. Non-legislative and legislative amendments are all applied
PO4B	As policy option 4, but without the effect of rescaling the label classes
PO4C	As policy option 4, but without the effect of third-party independent testing
PO4D	As policy option 4, but without the effect of online labelling
PO4E	As policy option 4, but without the effect of the Digital Registration database
PO4F	As policy option 4, but without the effect of mandatory labelling of OEM tyres

2. End user expenditure

End user purchase prices for C1, C2 and C3 tyres (price per tyre) are shown in the three tables below.

Table 94: End user purchase prices in each scenario and sub-scenario for C1 tyres

PO short name	2017	2020	2025	2030
BAU	83	85	87	89
PO2	83	86	88	89
PO3	83	90	91	94
PO3B	83	89	90	91
PO3C	83	87	90	92
PO3D	83	89	91	94
PO3E	83	88	91	93
PO3F	83	89	91	94
PO4	83	90	91	92
PO4B	83	89	90	90
PO4C	83	88	90	91
PO4D	83	90	91	93
PO4E	83	90	92	93
PO4F	83	89	91	93

Table 95: End user purchase prices in each scenario and sub-scenario for C2 tyres

PO short name	2017	2020	2025	2030
BAU	97	97	100	103
PO2	97	100	103	106
PO3	97	107	107	105
PO3B	97	108	113	115
PO3C	97	102	103	100
PO3D	97	104	105	103
PO3E	97	103	103	99
PO3F	97	107	107	105
PO4	97	112	117	119
PO4B	97	110	114	115
PO4C	97	106	113	115
PO4D	97	110	117	118
PO4E	97	108	115	117
PO4F	97	110	117	119

Table 96: End user purchase prices in each scenario and sub-scenario for C3 tyres

PO short name	2017	2020	2025	2030
BAU	528	525	523	525
PO2	528	519	520	519
PO3	528	516	521	523
PO3B	528	514	518	518
PO3C	528	517	521	526
PO3D	528	519	521	527
PO3E	528	519	523	527
PO3F	528	516	519	525
PO4	528	515	514	517
PO4B	528	515	518	516
PO4C	528	514	514	512
PO4D	528	511	516	514
PO4E	528	514	515	514
PO4F	528	511	516	512

The three graphs below show the development in total end-user expenditure in terms of total cost of ownership (TCO) for C1, C2 and C3 tyres respectively.

Figure 26: End- user net expenditure (Total Cost of Ownership, TCO), for C1 end users

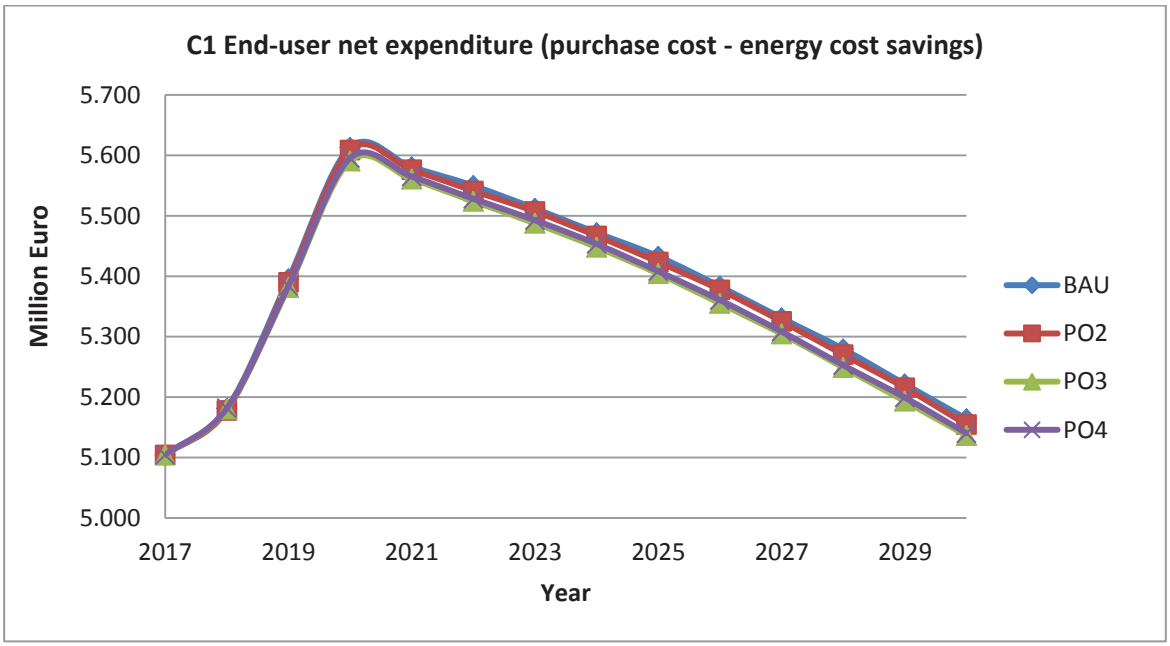


Figure 27: End- user net expenditure (Total Cost of Ownership, TCO), for C2 end users

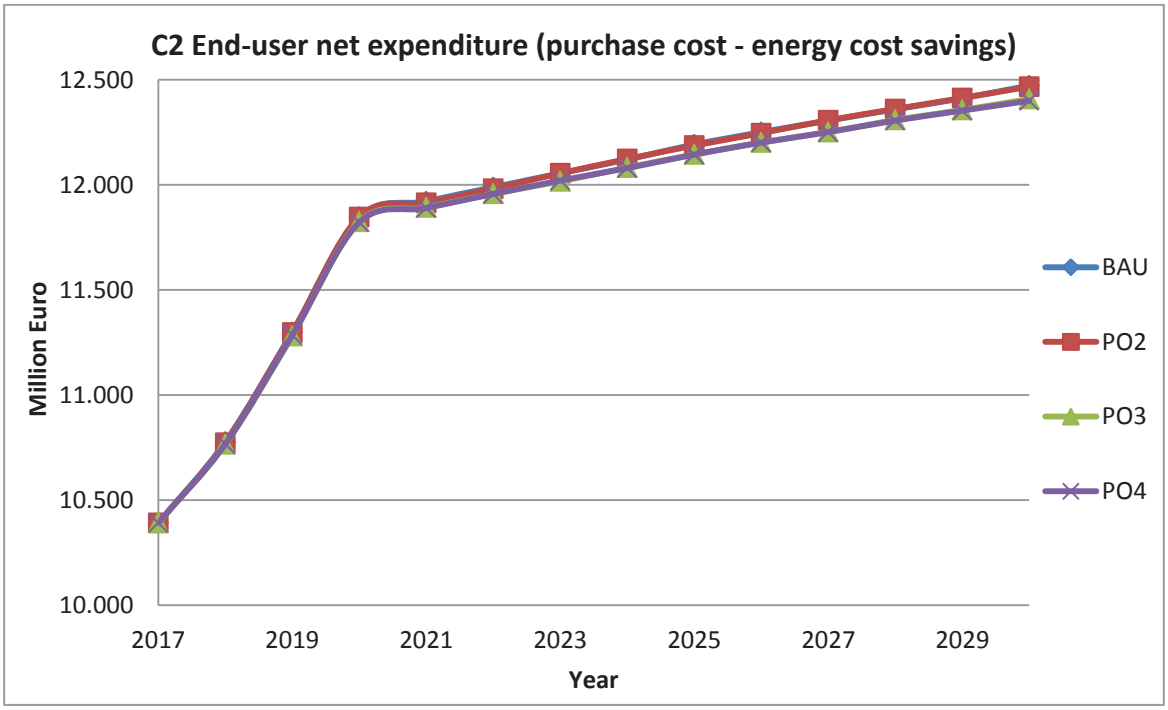
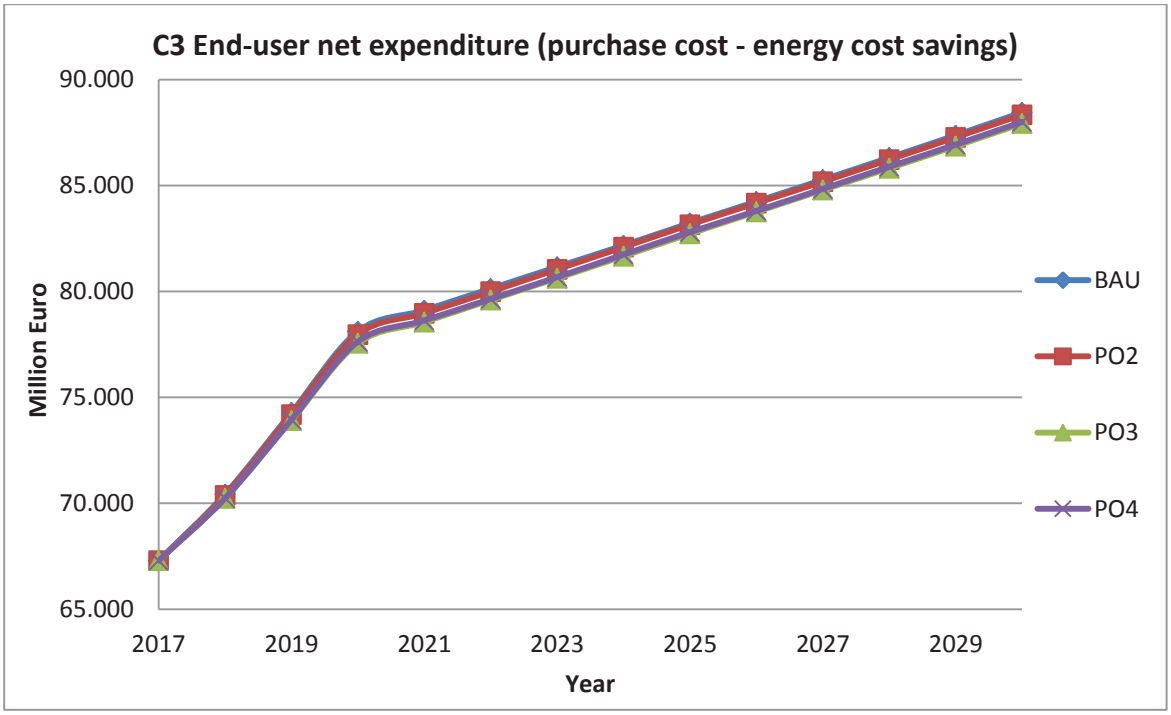
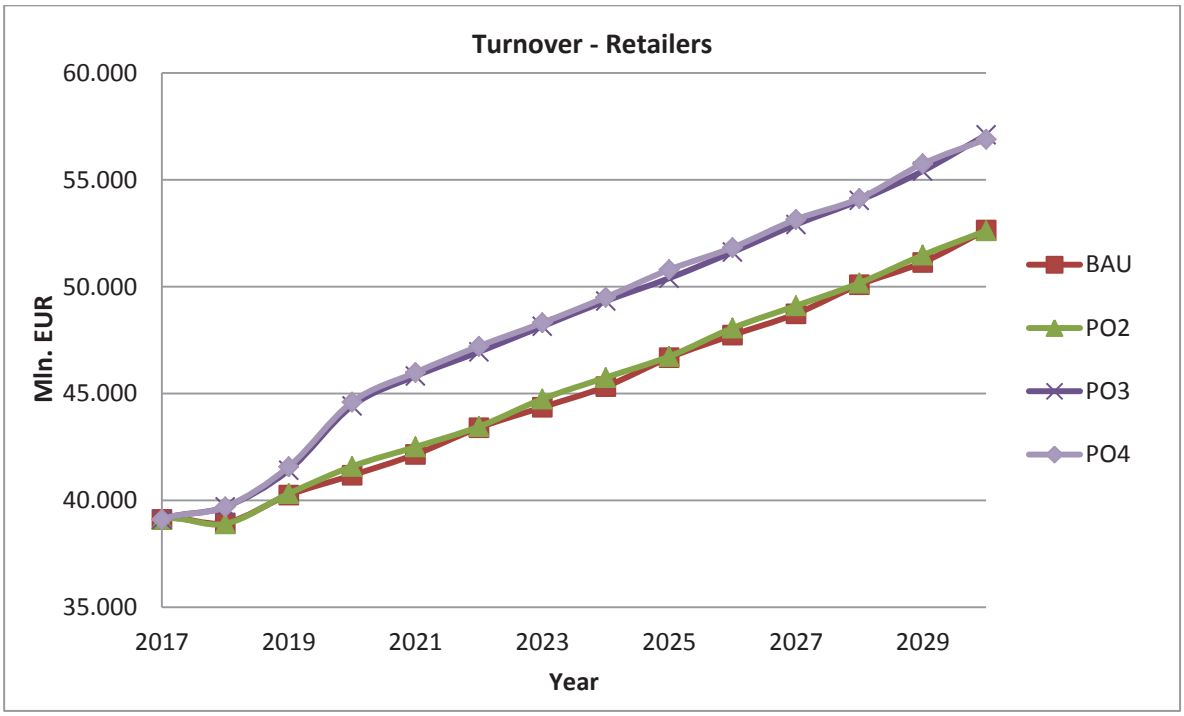
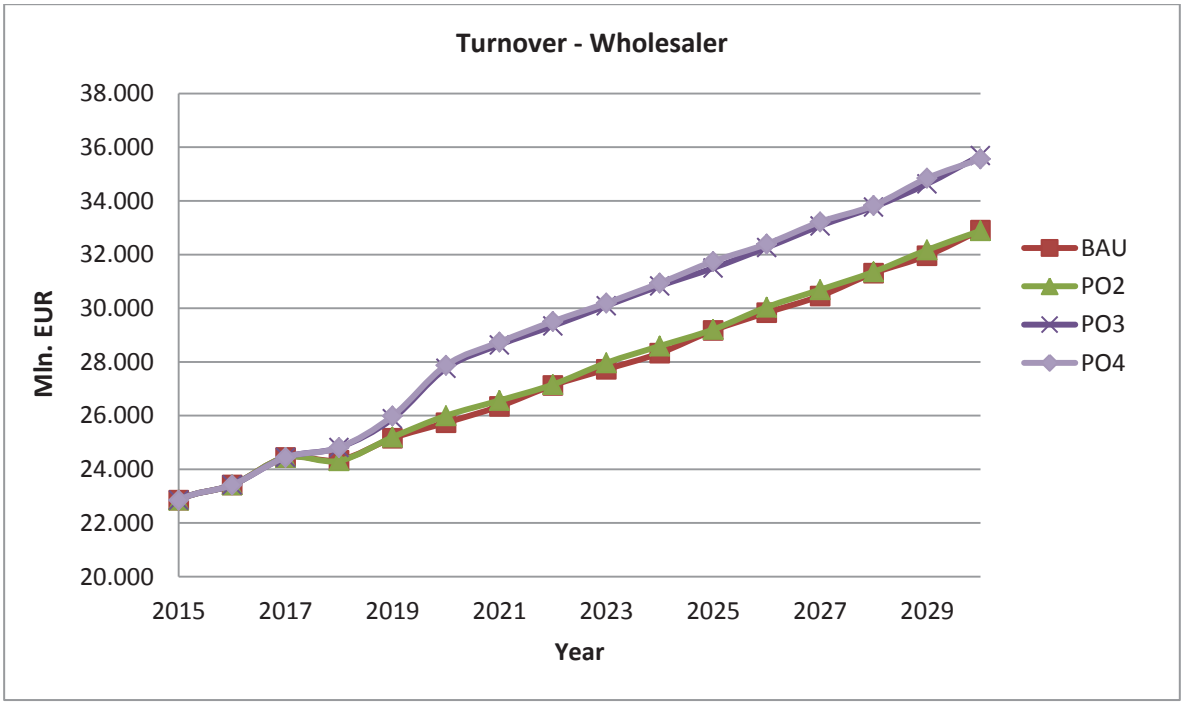


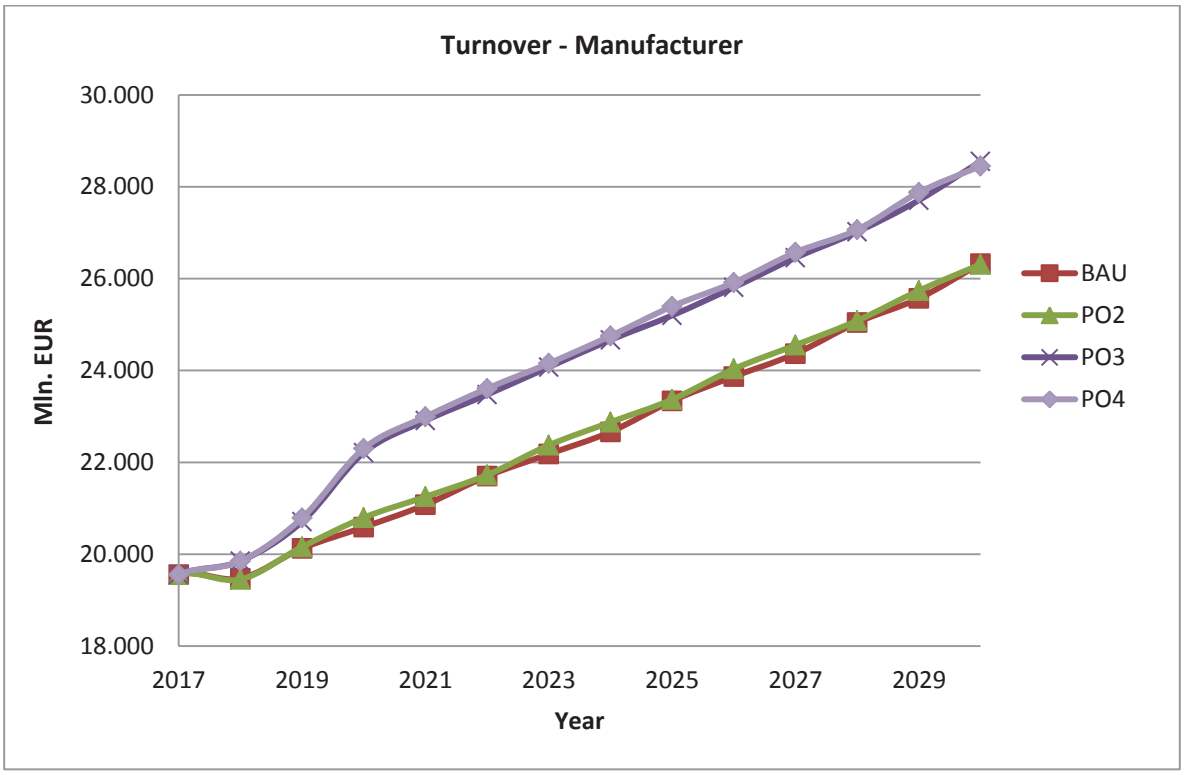
Figure 28: End-user net expenditure (Total Cost of Ownership, TCO), for C3 end users

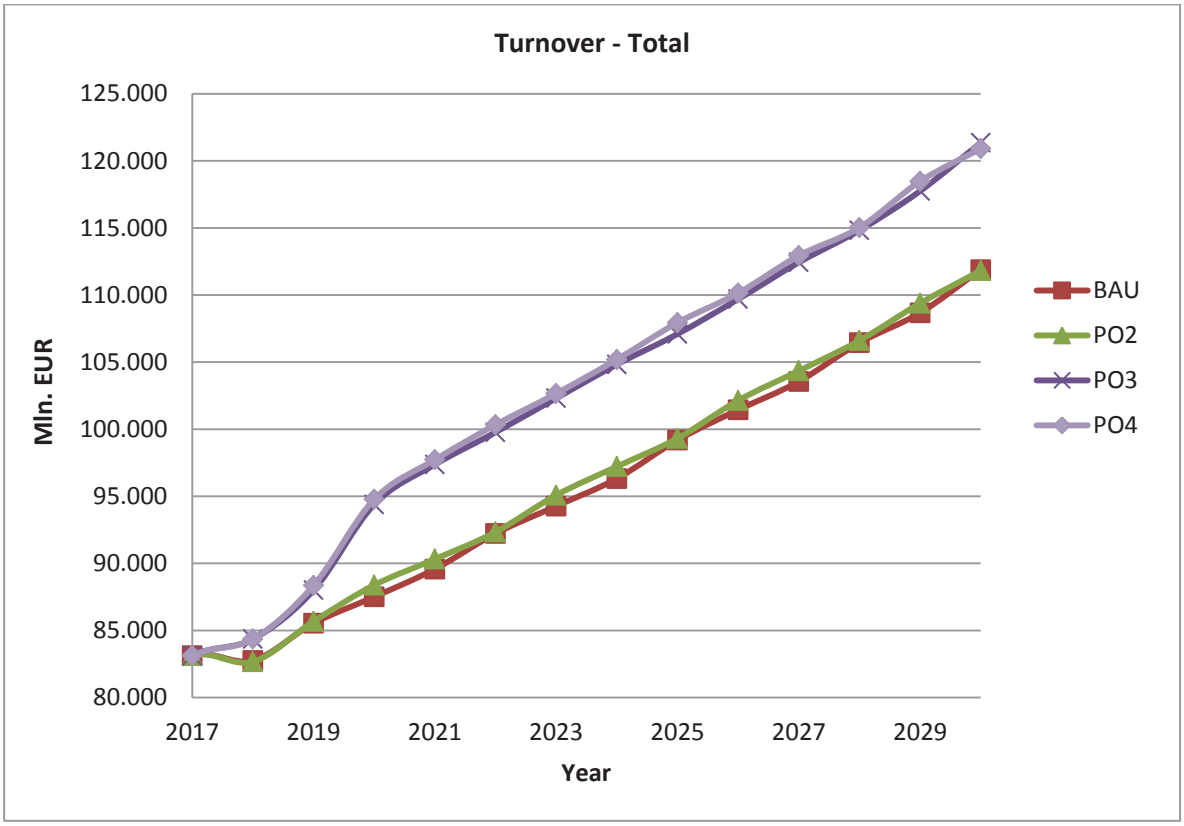


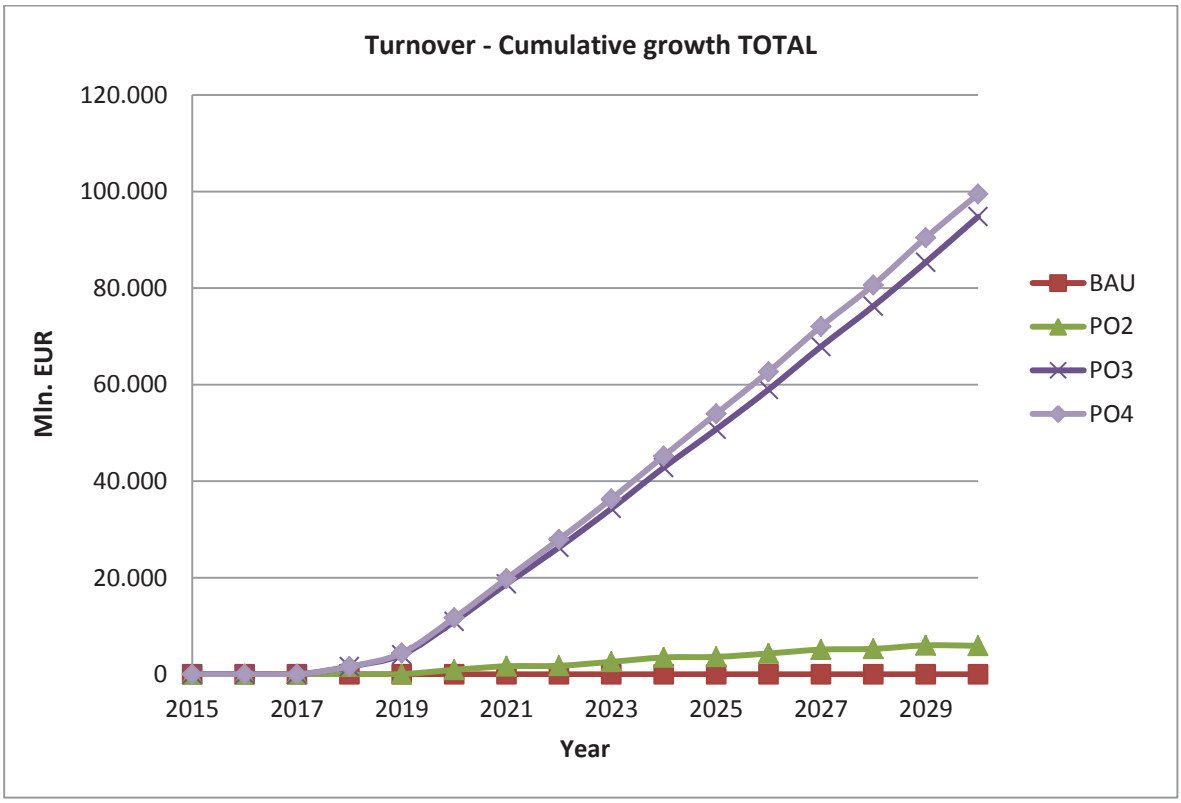
3. Economy: Business turnover

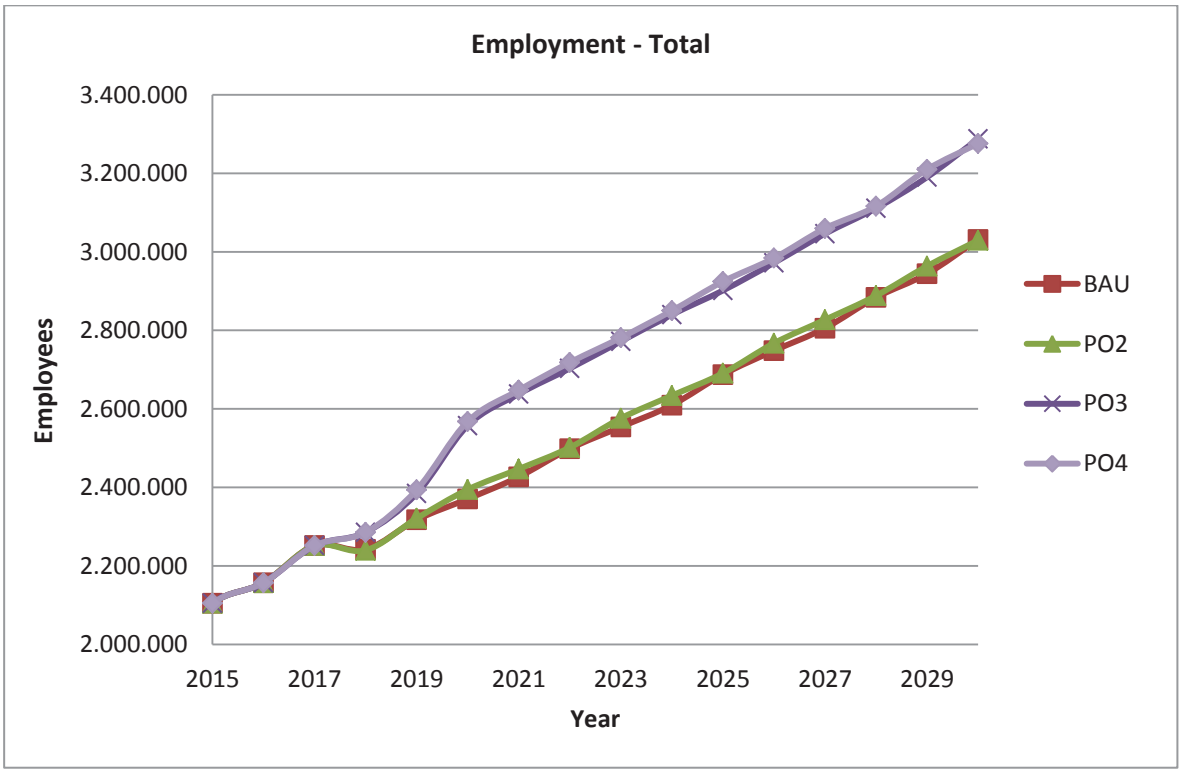




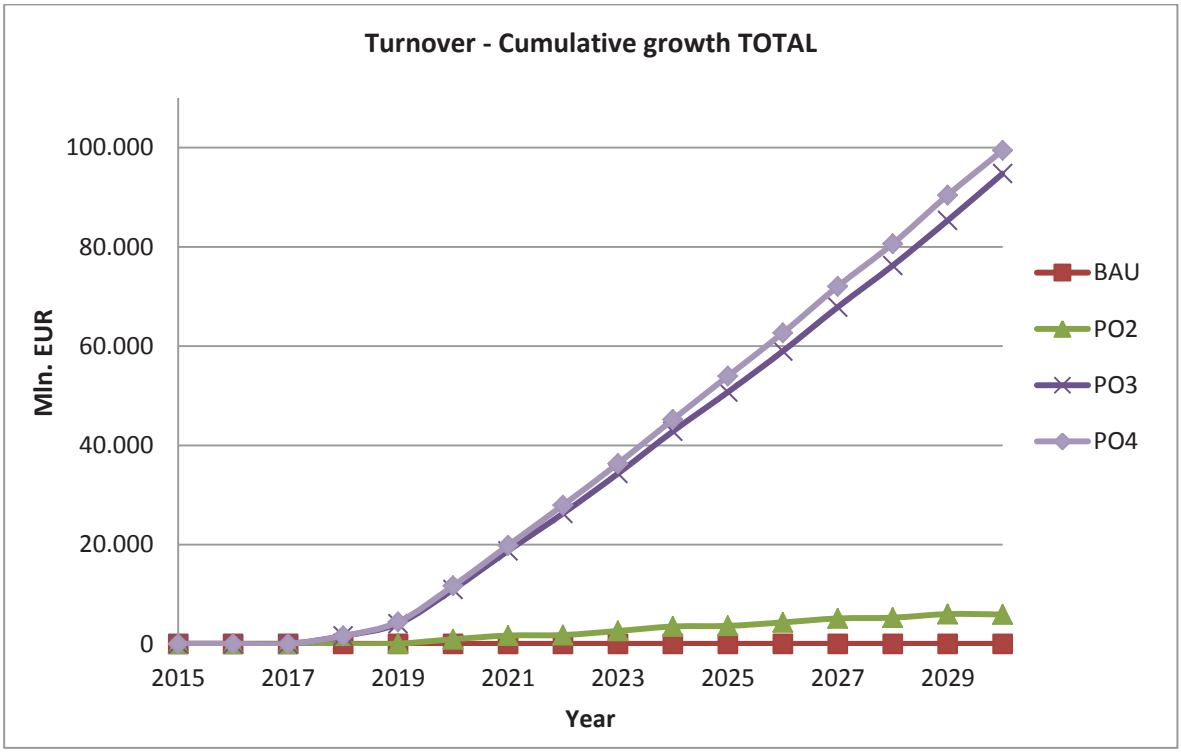

Turnover - Manufacturer
30.000
28.000
26.000
24.000
22.000
20.000
18.000
Mln. EUR
2017
2019
2021
2023
2025
2027
2029
Year
BAU
PO2
PO3
PO4

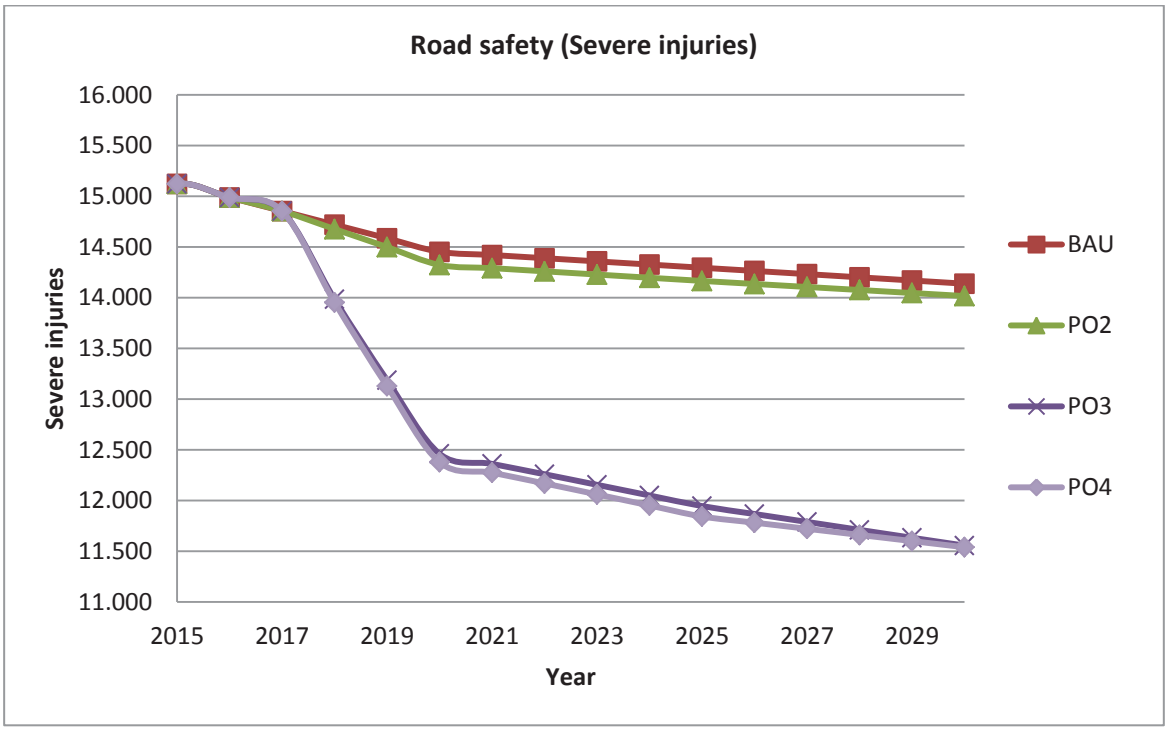

Turnover - Total
125.000
120.000
115.000
110.000
105.000
100.000
95.000
90.000
85.000
80.000
Mln. EUR
2017
2019
2021
2023
2025
2027
2029
Year
BAU
PO2
PO3
PO4

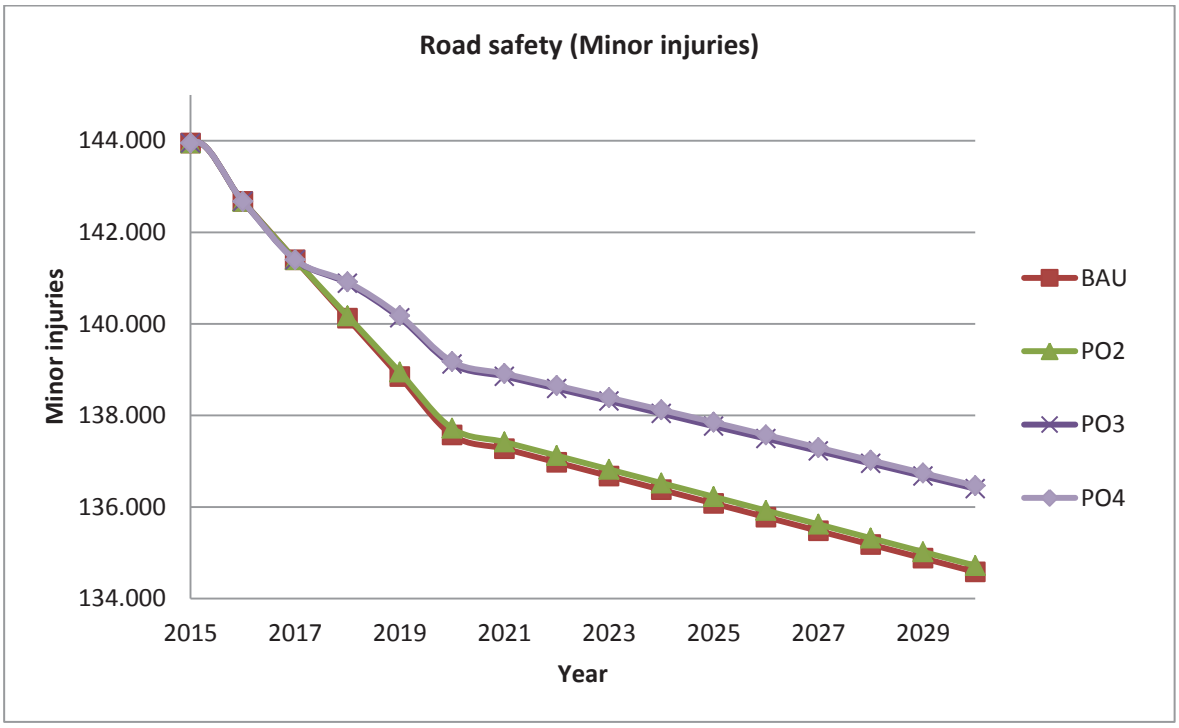

Turnover - Cumulative growth TOTAL
120.000
100.000
80.000
60.000
40.000
20.000
0
Mln. EUR
2015
2017
2019
2021
2023
2025
2027
2029
Year
BAU
PO2
PO3
PO4

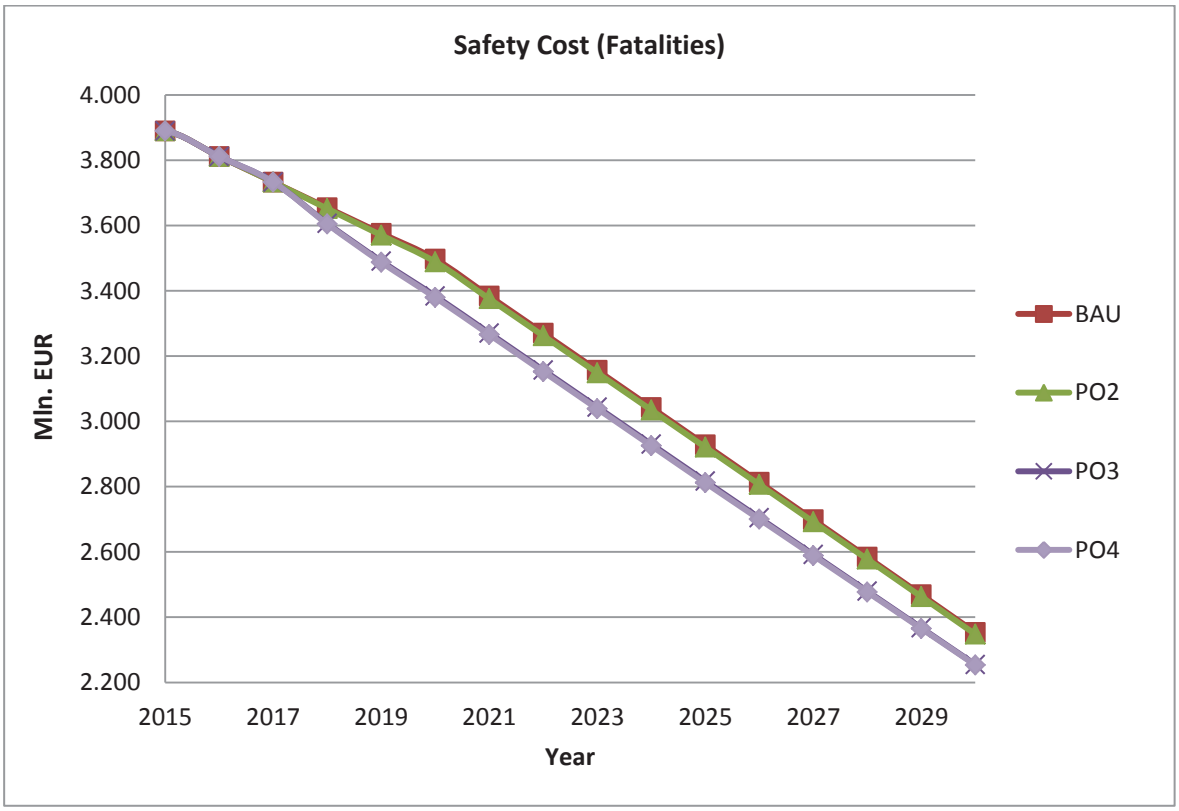

Employment - Total
3.400.000
3.200.000
3.000.000
2.800.000
2.600.000
2.400.000
2.200.000
2.000.000
Employees
2015
2017
2019
2021
2023
2025
2027
2029
Year
BAU
PO2
PO3
PO4

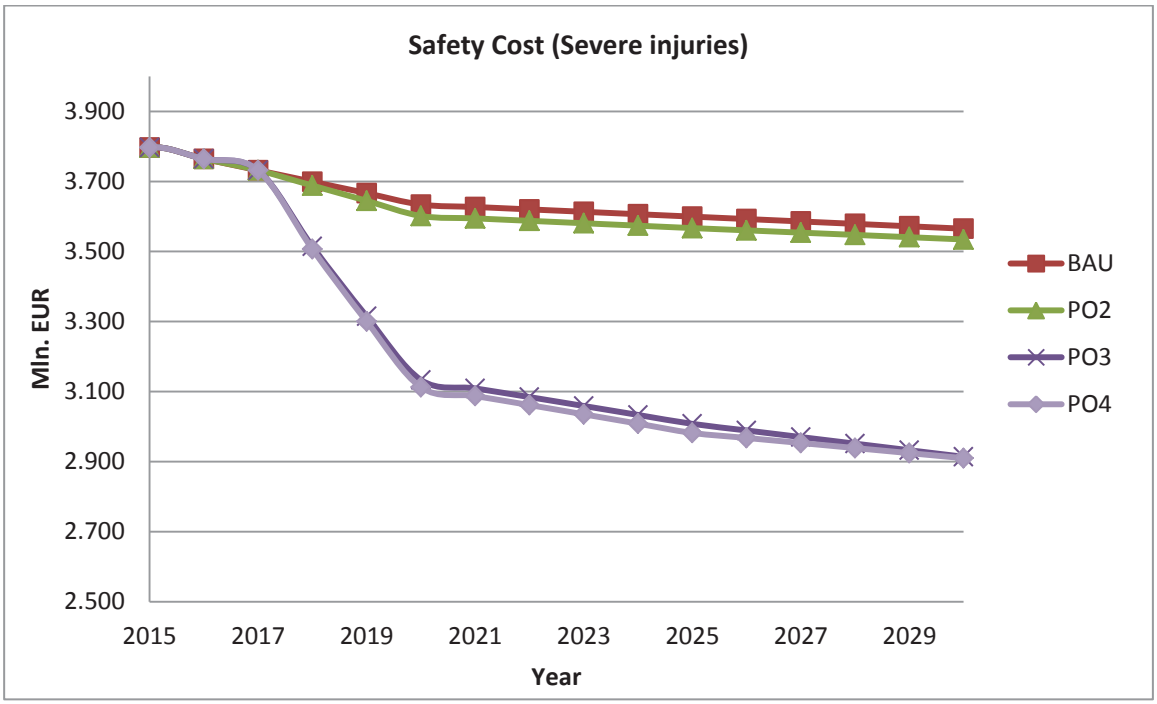
4. Safety and safety costs

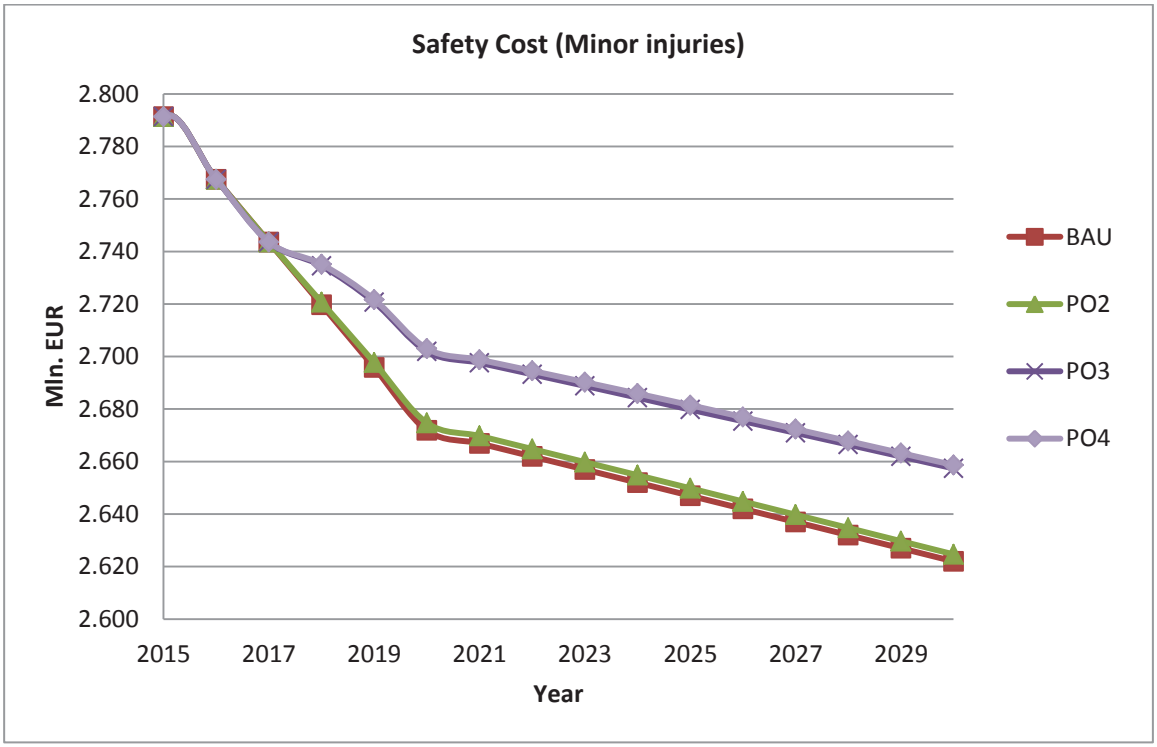


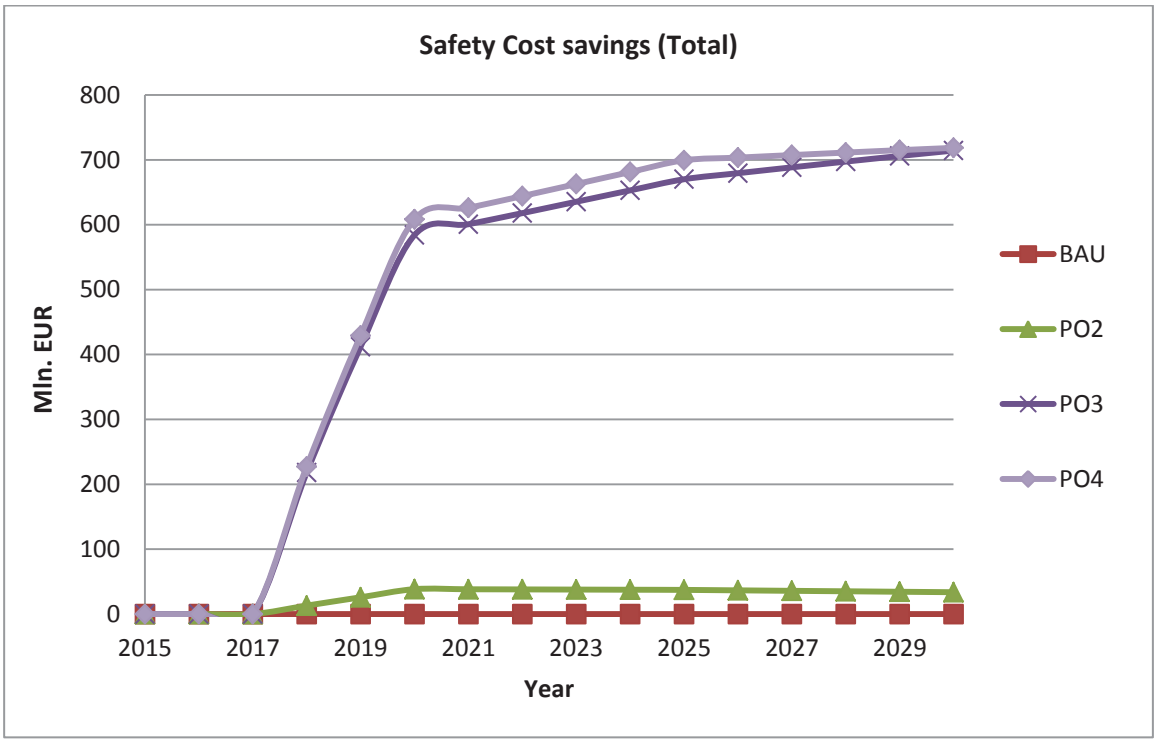



Road safety (Minor injuries)
144.000
142.000
140.000
138.000
136.000
134.000
Minor injuries
2015
2017
2019
2021
2023
2025
2027
2029
Year
BAU
PO2
PO3
PO4


Safety Cost (Fatalities)
4.000
3.800
3.600
3.400
3.200
3.000
2.800
2.600
2.400
2.200
Mln. EUR
2015
2017
2019
2021
2023
2025
2027
2029
Year
BAU
PO2
PO3
PO4

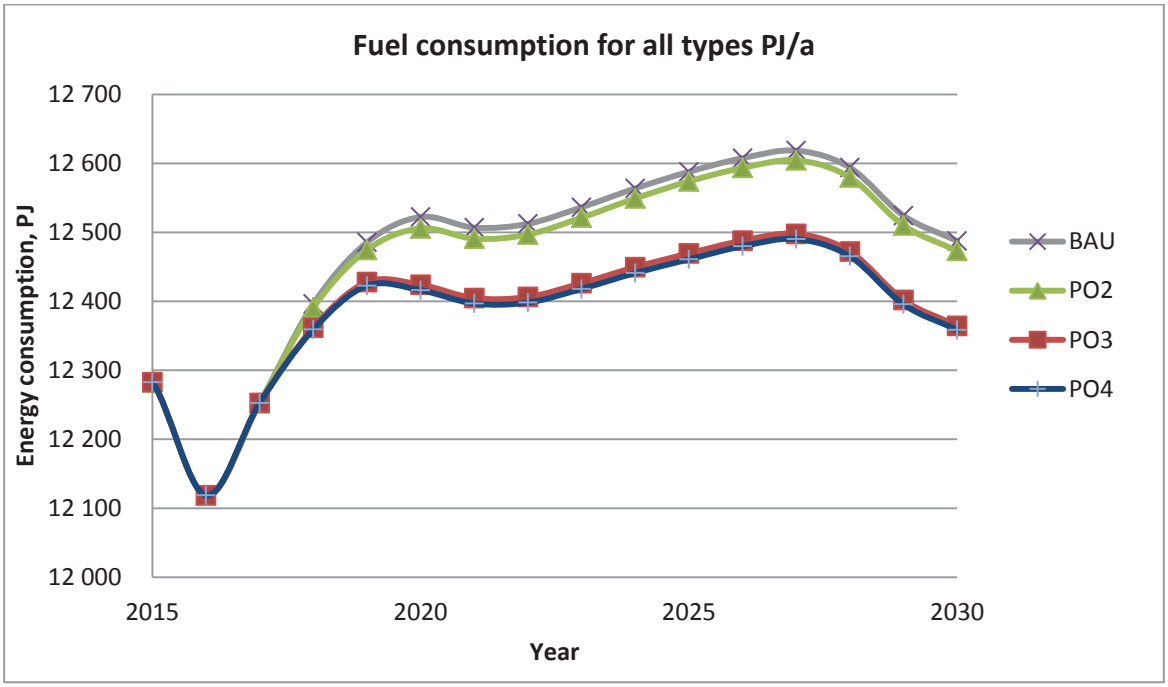

Safety Cost (Severe injuries)
3.900
3.700
3.500
3.300
3.100
2.900
2.700
2.500
Mln. EUR
2015
2017
2019
2021
2023
2025
2027
2029
Year
BAU
PO2
PO3
PO4

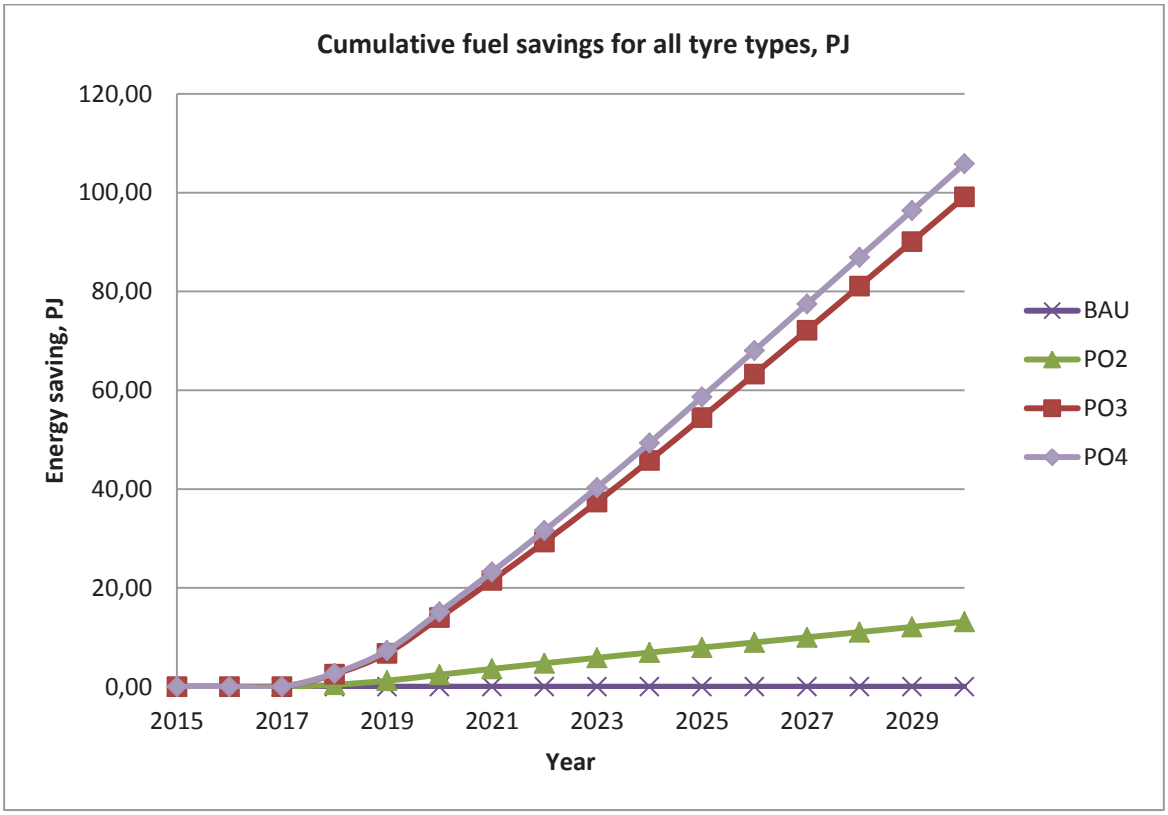

Safety Cost (Minor injuries)
2.800
2.780
2.760
2.740
2.720
2.700
2.680
2.660
2.640
2.620
2.600
Mln. EUR
2015
2017
2019
2021
2023
2025
2027
2029
Year
BAU
PO2
PO3
PO4

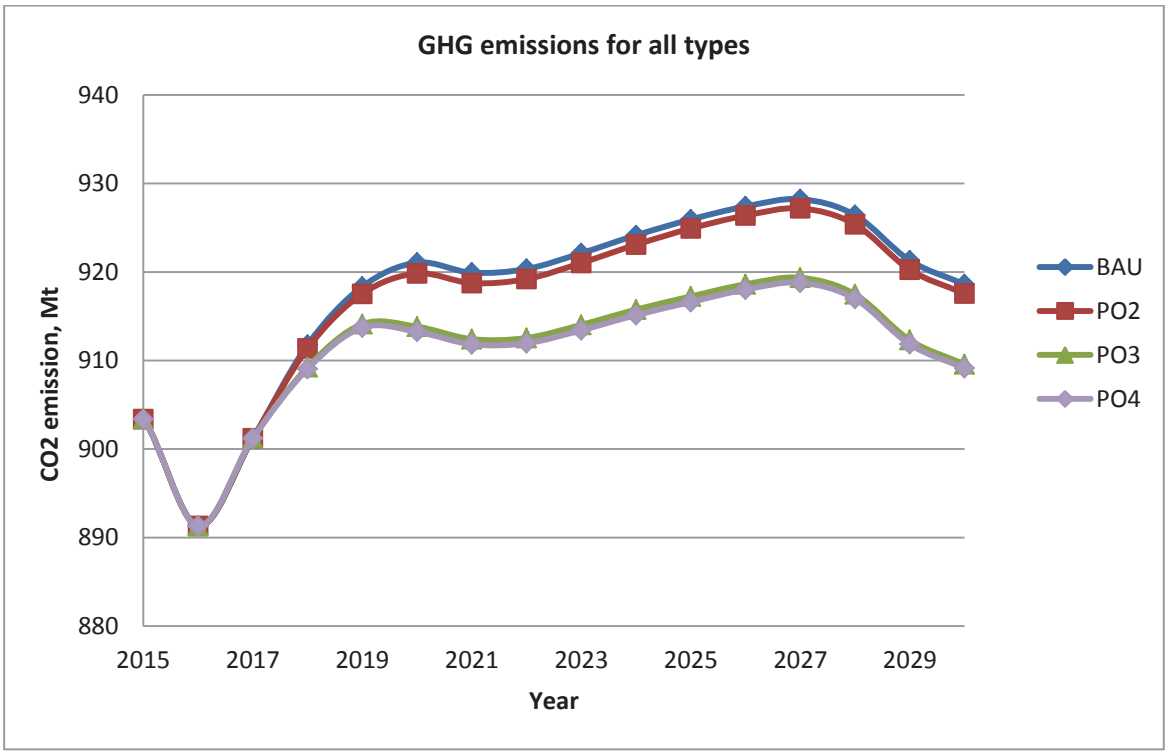

Safety Cost savings (Total)
800
700
600
500
400
300
200
100
0
Mln. EUR
2015
2017
2019
2021
2023
2025
2027
2029
Year
BAU
PO2
PO3
PO4

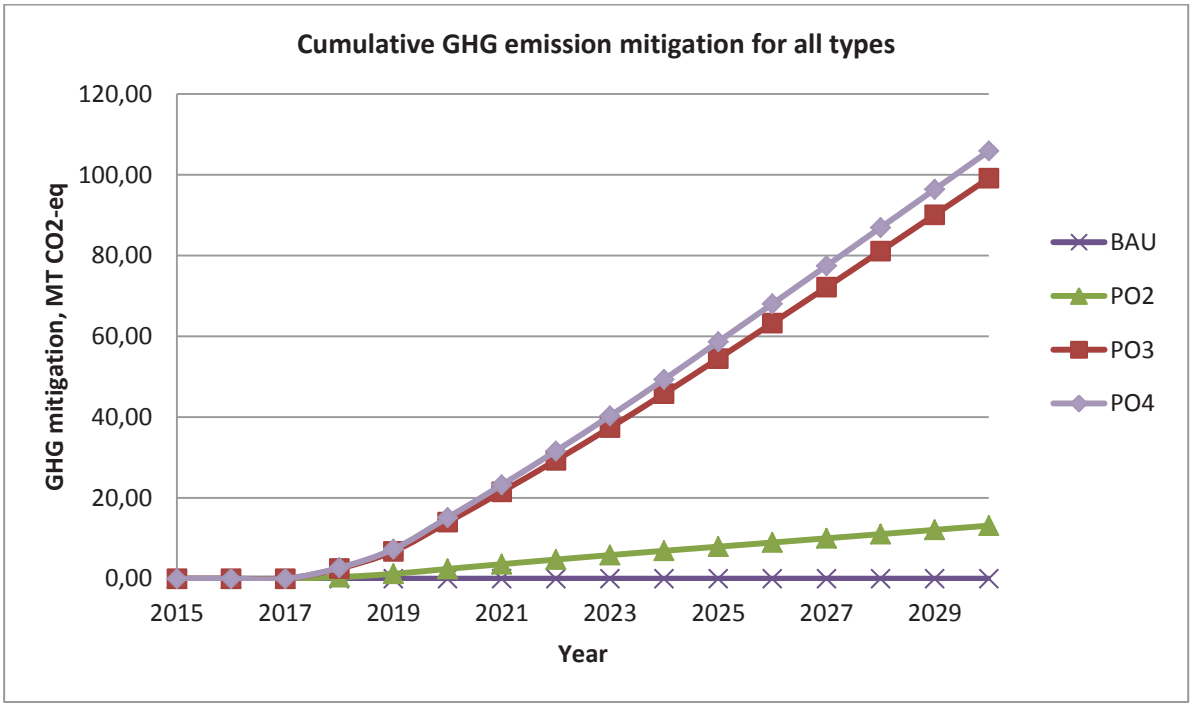

Safety Cost savings cumulative TOTAL
9.000
8.000
7.000
6.000
5.000
4.000
3.000
2.000
1.000
0
Mln. EUR
2015
2017
2019
2021
2023
2025
2027
2029
Year
BAU
PO2
PO3
PO4

5. Energy and GHG emissions






GHG emissions for all types
940
930
920
910
900
890
880
CO2 emission, Mt
2015
2017
2019
2021
2023
2025
2027
2029
Year
BAU
PO2
PO3
PO4


Cumulative GHG emission mitigation for all types
120,00
100,00
80,00
60,00
40,00
20,00
0,00
GHG mitigation, MT CO2-eq
2015
2017
2019
2021
2023
2025
2027
2029
Year
BAU
PO2
PO3
PO4

Annex 7: Glossary

Term or acronym	*Meaning or definition*
RRC	Rolling Resistance Coefficient
WG	Wet Grip
BAU	Business as Usual
PO2	Policy Option 2
PO3	Policy Option 3
PO4	Policy Option 4
OPC	Open Public Consultation
SRTT	Standard Reference Test Tyre
MSA	Market Surveillance Authority
C1 Tyres	Passenger car tyres
C2 Tyres	Light commercial vehicle tyres
C3 Tyres	Medium and Heavy commercial vehicle tyres
LCV	Light Commercial Vehicle
HCV	Heavy Commercial Vehicle
TCO	Total Cost of Ownership
LCC	Life Cycle Cost
GHG emissions	Greenhouse Gas emissions
OEM tyres	Original Manufacturer Equipment tyres (supplied with new vehicles)
TLR	Tyre Labelling Regulation, Regulation (EC) 1222/2009
GSR	General Safety Regulation for motor vehicles, Regulation (EC) No 661/2009
Type Approval Process	The tyre testing process under the GSR
OPC	Open Public Consultation
MS	Member State
3-PMSF	3-Peak Mountain Snow Flake
ICSMS	The internet-supported information and communication system for the pan-European market surveillance
ADCO groups	Administrative Cooperation Groups
SMEs	Small and Medium Enterprises
DALY	Disability Adjusted Life Years
VOLY	Value of One Life Year

Retreading	Thee worn-out tread of the tyre is replaced with a new one, which can be repeated as long as the casing integrity is guaranteed, and which extends the life of used tyres
Studded tyres	Tyres with metal studs embedded within the tread in order to increase the traction of the tyre, in particular on ice.