EUROPEAN
COMMISSION

Brussels, 30.3.2023
SWD(2023) 65 final

COMMISSION STAFF WORKING DOCUMENT

IMPACT ASSESSMENT REPORT

Accompanying the document

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

on the approval and market surveillance of non-road mobile machinery circulating on public roads and amending Regulation (EU) 2019/1020

{COM(2023) 178 final} - {SEC(2023) 145 final} - {SWD(2023) 64 final} - {SWD(2023) 66 final}

Table of contents

1. INTRODUCTION: POLITICAL AND LEGAL CONTEXT 4
   1.1. What is non-road mobile machinery? 4
   1.2. Political and legal context 4
   1.3. The non-road mobile machinery sector 8
2. PROBLEM DEFINITION 8
   2.1. What is/are the problems? 8
   2.2. What are the problem drivers? 19
   2.3. How will the problem evolve? 20
3. WHY SHOULD THE EU ACT? 20
   3.1. Legal basis 20
   3.2. Subsidiarity: Necessity of EU action 20
   3.3. Subsidiarity: Added value of EU action 21
4. OBJECTIVES: WHAT IS TO BE ACHIEVED? 21
   4.1. General objectives 21
   4.2. Specific objectives 21
5. WHAT ARE THE AVAILABLE POLICY OPTIONS? 22
   5.1. What is the baseline from which options are assessed? 23
   5.2. Description of the policy options 24
   5.3. Options discarded at an early stage 27
6. WHAT ARE THE IMPACTS OF THE POLICY OPTIONS? 28
   6.1. Policy Option 1.a – Type-approval 29
   6.1.1 Economic impacts 29
   6.1.1.1 Impact on manufacturers and distributors (large enterprises and SMEs) 29
   6.1.1.2 Impact on rental companies and end users 30
   6.1.1.3 Impact on Member States authorities 31
   6.1.1.4 Impact on technical services 32
   6.1.1.5 Impact on competitiveness 32
   6.1.1.6 Impact on single market 32
   6.1.2 Social impacts 33
   6.1.2.1 Road Safety 33
   6.1.3 Environmental impacts 33
   6.2. Policy Option 1.b – Simplified type-approval 34
   6.2.1 Economic impacts 34
   6.2.1.1 Impact on manufacturers and distributors (large enterprises and SMEs) 34
   6.2.1.2 Impact on rental companies and end users 35
   6.2.1.3 Impact on Member States authorities 35
   6.2.1.4 Impact on technical services 35

6.2.1.5 Impact on competitiveness 36
6.2.1.6 Impact on single market 36
6.2.2.1 Road Safety 36
6.2.3 Environmental impacts 36
6.3. Policy Option 2 – CE Marking (New approach type of legislation) 36
6.3.1 Economic impacts 37
6.3.1.1 Impact on manufacturers and distributors (large enterprises and SMEs) 37
6.3.1.2 Impact on rental companies and end users 38
6.3.1.3 Impact on Member States authorities 38
6.3.1.4 Impact on technical services 39
6.3.1.5 Impact on competitiveness 39
6.3.1.6 Impact on single market 39
6.3.2 Social impacts 39
6.3.2.1 Road Safety 39
6.3.3 Environmental impacts 40
6.4. Directive or regulation 40
6.5. Mandatory versus optional 40
6.6. Include (or not) towed equipment 43
6.7. Limit (or not) the scope to a maximum design speed up to 40 Km/h 43
7. HOW DO THE OPTIONS COMPARE? 45
8. PREFERRED OPTION 52
8.1. Simplified type-approval, mandatory, covering self-propelled machinery only and with a maximum design speed limit up to 40 km/h 52
8.2. Choice of the instrument: a regulation. 53
9. HOW WILL ACTUAL IMPACTS BE MONITORED AND EVALUATED? 54
ANNEX 1: PROCEDURAL INFORMATION 56
1. LEAD DG, DECIDE PLANNING/CWP REFERENCES 56
2. ORGANISATION AND TIMING 56
3. CONSULTATION OF THE RSB 56
4. EVIDENCE, SOURCES AND QUALITY 58
ANNEX 2: STAKEHOLDER CONSULTATION 61
ANNEX 3: WHO IS AFFECTED AND HOW? 74
1. PRACTICAL IMPLICATIONS OF THE INITIATIVE 74
2. SUMMARY OF COSTS AND BENEFITS 74
ANNEX 4: ANALYTICAL METHODS 76
ANNEX 5: VEHICLE FEATURES 77

Glossary

Term or acronym	*Meaning or definition*
Certificate of Conformity	A Certificate of Conformity is a statement by the manufacturer that the vehicle conforms to EU type-approval requirements
Conformity Assessment	Conformity assessment is the name given to the processes that are used to demonstrate that a product, service or management system or body meets specified requirements
EU	European Union
Homologation	Homologation is the granting of approval by an official authority
Motor vehicle registration	Motor vehicle registration is the registration of a motor vehicle with a government authority, either compulsory or otherwise. The purpose of motor vehicle registration is to establish a link between a vehicle and an owner or user of the vehicle. This link might be used for taxation or crime detection purposes. While almost all motor vehicles are uniquely identified by a vehicle identification number, only registered vehicles display a vehicle registration plate and carry a vehicle registration certificate
NRMM	Non-road mobile machinery
PRODCOM	Statistics on the production of manufactured goods
SMEs	Small and Medium Enterprises
Type-Approval	Type approval or certificate of conformity is granted to a product that meets a minimum set of regulatory, technical and safety requirements. Generally, type approval is required before a product is allowed to be sold in a particular country, so the requirements for a given product will vary around the world. Processes and certifications known as type approval are generally called homologation.
EU Type-Approval Category M	Vehicles carrying passengers
EU Type-Approval Category N	Vehicles carrying goods
EU Type-Approval Category O	Trailers
EU Type-Approval Category L	2- and 3-wheel vehicles and quadricycles
EU Type-Approval Category T	Wheeled agricultural and forestry tractors
EU Type-Approval Category C	Tracked agricultural and forestry tractors
EU Type-Approval Category R	Agricultural trailers
EU Type-Approval Category S	Agricultural interchangeable towed equipment

1. INTRODUCTION: POLITICAL AND LEGAL CONTEXT

1.1. What is non-road mobile machinery?

Non-road mobile machinery (hereafter 'NRMM', or simply 'non-road mobile machinery') means any self-propelled or towed vehicle machinery that is designed and constructed specifically to perform work and which, because of its construction characteristics, is not suitable for carrying passengers or for transporting commercial goods. In this impact assessment, tractors are not considered non-road mobile machinery[1].

In the execution of their work, these machines are often required to move around and may, from time to time, need to circulate on the road to go from one workplace to another.

The main types of non-road mobile machinery belong to the agricultural and forestry, construction, garden, material handling and municipal equipment sectors. Non-road mobile machinery may have a huge variety of designs, depending on the intended use of the machinery. Some examples[2] of non-road mobile machinery are:

- Agricultural and forestry: Combine harvesters, forage harvesters, sprayers;
- Construction: Loaders, excavators/diggers, dumpers, telescopic loaders, mobile cranes;
- Garden: Ride-on mowers;
- Material handling: Forklifts, side loaders, tele handlers;
- Municipal: Street sweepers, lifting platforms, snow cleaners.

Figure 1. Main non-road mobile machinery sectors

Agricultural Construction Garden Material handling Municipal

1.2. Political and legal context

Over the last decades, substantive efforts have been made to harmonise different aspects affecting non-road mobile machinery, such as the product safety[3], pollutant emissions[4],

[1] In this impact assessment, agricultural tractors are not considered non-road mobile machinery since their road safety requirements are covered by a separate legal act, namely Regulation (EU) No 167/2013 of the European Parliament and of the Council of 5 February 2013 on the approval and market surveillance of agricultural and forestry vehicles.

[2] List not exhaustive.

[3] Directive 2006/42/EC of the European Parliament and of the Council of 17 May 2006 on machinery, OJ L 157, 9.6.2006, p. 24–86.

[4] Regulation (EU) 2016/1628 of the European Parliament and of the Council of 14 September 2016 on requirements relating to gaseous and particulate pollutant emission limits and type-approval for internal combustion engines for non-road mobile machinery, OJ L 252, 16.9.2016, p. 53–117.

noise emissions[5] as well as electromagnetic disturbances generated by these machines[6]. However, no harmonisation exists as regards the technical requirements for the road circulation of non-road mobile machinery.

The Machinery Directive[7] is the regulatory basis governing the safety of non-road mobile machinery placed on the EU market. It requires that non-road mobile machinery placed on the single market meet the essential health and safety requirements set out in the Annex I to the Directive. These requirements cover the off-road travelling function of non-road mobile machinery such as slowing down, stopping, braking, driving seats, restraint systems, etc. However, the essential health and safety requirements in the Machinery Directive are designed to cover the occupational safety, i.e. when machinery is at work, but do not cover the safety aspects related to the circulation of this machinery on public roads[8].

In EU law, the technical safety of vehicles, including the requirements for road circulation are harmonised and regulated in vehicle type-approval legislation such as Regulation (EU) 2018/858 on the approval and market surveillance of motor vehicles and their trailers[9], or Regulation (EU) No 167/2013 on the approval and market surveillance of agricultural and forestry vehicles[10]. However, these legislative acts do not cover non-road mobile machinery, with the following exceptions: categories **R (agricultural trailers)** and **S (agricultural interchangeable towed equipment),** for which manufacturers can apply for road approval **under Regulation (EU) No 167/2013** on an optional basis, and **most of the towed equipment today can be homologated under category O (trailers). All other mobile machines are not covered by the type-approval framework**. This leaves a gap in the single market as manufacturers need to comply with different technical rules and conformity assessment procedures set up by each EU country.

For many years, the industry has informed the Commission about the administrative and cost burdens manufacturers are facing due to non-harmonisation of road approval requirements for non-road mobile machinery.[11]

The Commission proposal for a Tractor Regulation in 2012[12] included a category type of agriculture non-road mobile machinery. However, during the legislative process, this

[5] Directive 2000/14/EC of the European Parliament and of the Council of 8 May 2000 on the approximation of the laws of the Member States relating to the noise emission in the environment by equipment for use outdoors, OJ L 162, 3.7.2000, p. 1–78.

[6] Directive 2014/30/EU of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of the Member States relating to electromagnetic compatibility, OJ L 96, 29.3.2014, p. 79–106.

[7] Directive 2006/42/EC of the European Parliament and of the Council of 17 May 2006 on machinery, OJ L 157, 9.6.2006, p. 24–86.

[8] The European Commission adopted a proposal for a new Regulation on Machinery Products on 21 April 2021, which will replace the existing Machinery Directive. Like the current directive, the proposed Regulation will not cover the safety aspects related to the circulation of non-road mobile machinery on public roads. The proposed Regulation is undergoing inter-institutional negotiations and can be found at: https://ec.europa.eu/docsroom/documents/45508.

[9] Regulation (EU) 2018/858 of the European Parliament and of the Council of 30 May 2018 on the approval and market surveillance of motor vehicles and their trailers, and of systems, components and separate technical units intended for such vehicles, OJ L 151, 14.6.2018, p. 1–218.

[10] Regulation (EU) No 167/2013 of the European Parliament and of the Council of 5 February 2013 on the approval and market surveillance of agricultural and forestry vehicles, OJ L 60, 2.3.2013, p. 1–51

[11] Industry position available at: https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/1198-Road-circulation-requirements-for-mobile-machinery/feedback_en?p_id=131560&page=1.

[12] COM/2010/0395.

category was disregarded. Instead, **Recital 6 of Regulation (EU) 167/2013[13] was introduced, asking the Commission to carry out a study to identify policy options for harmonising road approval requirements for non-road mobile machinery**. In reply, the Commission launched an impact assessment study, which was finalised in 2016 (the 'impact assessment study'[14]). This study focused on the direct costs faced by stakeholders in compliance with the different requirements in the EU countries and did not provide enough reliable information on the indirect costs incurred by the different stakeholders, despite these costs being significant. As a result, the Commission commissioned a second study focusing on the costs and benefits of the different policy options that are the subject of this impact assessment. This second study was finalised in 2019 (the 'costs and benefits study'[15]). Both studies are contributors to this impact assessment report, together with public and targeted consultations, workshops and other meetings held with stakeholders including Member State authorities, technical services for road approvals, manufacturers and distributors, rental companies and individual end users (see Annex 2 to this report for more details).

The following table presents the existing legal frameworks as regards vehicle safety legislation:

Table 1. Vehicle safety legal framework

Type of vehicle	Vehicle occupational safety (safety at work)	Vehicle road circulation safety	Road circulation safety other than vehicle safety
Cars, trucks, trailers, motorbikes, tractors	Regulations 2018/858, 167/2013 and 168/2013 on motor vehicle categories; M, N, O, L, T, C		Other legislation on road rules other than vehicle safety (such as road infrastructure, road circulation rules, rules on vehicles allowed or not to circulate in certain roads, driving license, etc.)
Agricultural trailers and interchangeable towed equipment	Directive 2006/42/EC on machinery	Regulation 167/2013 for categories R and S (optional) or national rules	
Self-propelled mobile machinery	Directive 2006/42/EC on machinery	Technical safety requirements for road circulation -> 27 sets of national rules	

EU 'Old approach' legislation (Type-approval)

EU 'New Approach' legislation

Not harmonised at EU level

Category descriptions: M: vehicles carrying passengers; N: vehicles carrying goods[16]; O: Trailers; L: 2- and 3-wheel vehicles and quadricycles; T: wheeled agricultural and forestry tractors; C: tracked agricultural and forestry tractors; R: agricultural trailers; S: agricultural interchangeable towed equipment.[17]

[13] Regulation (EU) No 167/2013 of the European Parliament and of the Council of 5 February 2013 on the approval and market surveillance of agricultural and forestry vehicles, OJ L 60, 2.3.2013, p. 1–51.

[14] "Study on the EU harmonisation of the requirements for the road circulation of mobile machinery". ECORYS, 2016. Available at: https://single-market-economy.ec.europa.eu/sectors/mechanical-engineering/mobile-machinery_en.

[15] "Cost/benefit analysis study for Impact Assessment on road circulation of Non-road mobile machinery", PPMI, 2019. Available at: https://op.europa.eu/en/publication-detail/-/publication/c0d598e2-17d8-11ea-8c1f-01aa75ed71a1/language-en.

[16] Vehicles built on a truck platform are truck-like, and as such, are covered by the category 'N' type-approval legislation, since speed and characteristics are those of a truck. They are therefore out of the scope of this initiative.

[17] Available at: https://ec.europa.eu/growth/sectors/automotive/vehicle-categories.

Type-approval legislation and the Machinery Directive are fundamentally different frameworks for product safety legislation. The type-approval framework (in green in the above table) is sometimes referred to as the 'old approach' legislation, where technical specifications are embedded in the legal text itself. Type-approval describes the process applied by national authorities to certify that a model of a vehicle meets all EU safety, environmental and conformity of production requirements before authorising it to be placed on the EU market. In practice, the manufacturer makes available a number of pre-production vehicles that are equal to the final product. These prototypes are used to test compliance with EU safety rules (installation of lights, braking performance, stability control, etc.). If all relevant requirements are met, the national authority delivers an EU vehicle type-approval to the manufacturer authorising the sale of the vehicle type in the EU. The approval granted by one Member State authority is valid throughout the entire EU (i.e., certified once, accepted everywhere in the EU). Every vehicle produced is then accompanied by a certificate of conformity, in which the manufacturer certifies that the vehicle corresponds to the approved type. Based on this document, the vehicle can be registered anywhere in Europe.

In contrast, the Machinery Directive (in orange in the above table) follows the 'new approach' principles of EU legislation, where the legal text only lays down the essential health-and-safety requirements to be complied with by the product, without prescribing any specific technical solution for complying with those requirements. This creates a technologically neutral legal act that allows manufacturers to develop new innovative designs to comply with the legislative requirements. To help manufacturers prove that their machinery conforms to the requirements, harmonised standards whose references are published in the Official Journal of the European Union provide a presumption of conformity with the requirements in the legal act. However, their use always remains voluntary.

In the absence of harmonised rules, the principle of mutual recognition allows for the free movement of goods in the single market. Mutual recognition guarantees that any good lawfully sold in one EU country can be sold in another Member State without the need for dedicated EU harmonising legislation. However, the principle of mutual recognition is hard to apply in highly technical and regulated areas of the economy. The strong diversity of national rules, the big variety of machinery products, the sensitive political nature of road safety for Member States and the strong burden of proof with respect to the demonstration of technical equivalence, all prevent mutual recognition from being an adequate alternative to EU harmonising legislation (see sections 2 and 5).

Both the Type-Approval legislation and the Machinery Directive are frameworks regulating product safety features and do not affect other aspects that may be regulated with the aim to ensure safety on the roads, such as road infrastructure rules, circulation rules (speed limits, prohibition to circulate in certain roads, etc.), driver licences and other.

This initiative is consistent with the Commission's New Legislative Framework[18] and policy on the Single Market (Single Market Act)[19].

[18] To improve the internal market for goods and strengthen the conditions for placing a wide range of products on the EU market, the new legislative framework was adopted in 2008. It is a package of measures that aim to improve market surveillance and boost the quality of conformity assessments. It also clarifies the use of CE marking and creates a toolbox of measures for use in product legislation.https://ec.europa.eu/growth/single-market/goods/new-legislative-framework_en.

1.3. The non-road mobile machinery sector

The non-road mobile machinery industry cannot be statistically defined as a 'sector', as it consists of a range of products that cover different sectors such as agricultural (excl. tractors), construction, garden, material handling and municipal equipment.

The overall non-road mobile machinery EU production value can be estimated at **€12.5 billion, based on 2019 data**[20]**.** The covid-19 pandemic in 2020 affected the sector, which presented lower production figures. Nonetheless, the industry showed a relatively prompt recovery from the crisis in 2021. In any case, production figures for 2019 are considered more representative for the sector than those for 2020. Annual production figures for each category of self-propelled and towed non-road mobile machinery in 2019 are reported in Annex 4.

The **production** of non-road mobile machinery in the EU is **highly concentrated in a small number of EU countries**. Almost 80% of the production is in just six EU countries: Germany (37 %), Italy (11%), France (10%) and Finland, Sweden and Austria (7% each).

The production of non-road mobile machinery in the EU is carried out by both **large and small manufacturers**. Like in other segments of the machinery industry, a small number of large companies control large shares of the market, while SMEs tend to be more specialised in niche markets. An estimation of size distribution points to SMEs accounting for 98% of all companies registered. Nevertheless, large enterprises contribute 82% of the sector's revenues and 70% of employment[21].

The EU non-road mobile machinery sector is a significant producer and **strong exporter** of non-road mobile machinery globally. Out of the annual production value, 42% exported to non-EU countries and 54% is traded intra-EU, hence **only 4% is sold in the EU country where production takes place**[22]. Thus, non-road mobile machinery producers are extremely reliant on road approval in other countries.

2. PROBLEM DEFINITION

2.1. What is/are the problems?

The lack of harmonisation leads to considerable differences across EU countries in technical requirements and approval procedures, and therefore harms the correct functioning of the single market. Some EU countries have a conformity assessment procedure for the entire non-road mobile machinery similar to a type-approval with third party testing (e.g., Austria, Germany, Italy, Portugal, Slovak Republic, Spain; France for agricultural self-propelled machinery only, but not for construction machinery). Other countries have lighter processes, based on documentation from the manufacturer (e.g., Belgium, Luxembourg, Greece), on internal production control (Estonia), on CE

---

[19] http://ec.europa.eu/growth/single-market.

[20] Eurostat 2019 data: Sold production, exports and imports by PRODCOM list (NACE Rev. 2) - annual data [DS-066341].

[21] ESTAT 2018: Annual enterprise statistics by size class for special aggregates of activities (NACE Rev. 2), C283 and C289 [SBS_SC_SCA_R2__custom_1485219]

[22] Eurostat 2019 data: Sold production, exports, and imports by PRODCOM list (NACE Rev. 2) - annual data [DS-066341].

Declaration of Conformity under the Machinery Directive (Finland, Latvia) or on in-house certification (Sweden). [23]

The most demanding requirements categories include vehicle performance and control (especially braking and max. speed), vehicle dimensions (max. weight/length/width), road surface protection (max. axle loading, max. surface contact pressure), vehicle awareness (in particular, lighting, signalling and reflectors), operator vision (including operator field of vision and mirrors) and vehicle design (mechanical towing couplings). The following table provides a detailed overview on each category of requirements.

Table 3. Vehicle features relevant for road safety

Vehicle features	Vehicle detailed features
Vehicle masses, dimensions and structure	Maximum authorized mass, maximum length /width /height, vehicle structure integrity, swinging upper structure
Vehicle performance & control	Braking system, steering system, turning radius, maximum design speed, speedometer
Road surface protection	Maximum axle loading, maximum surface contact pressure, tyres and tracks
Vehicle awareness	Audible warning device, lighting, signalling installation, side reflectors, rotating beacon, external sound level
Operator vision	Field of vision, windscreen wipers, rear-view mirrors, sun visor, glazing and installation
Vehicle components related to functional safety	Vehicle structure integrity, heating /ventilation/filtration systems, mechanical couplings/towing devices, fuel tank pressurization and leakage, guards and fenders, operator controls related to circulation, unauthorised use prevention

It is estimated that about half of current national technical requirements mainly translate into **high administrative hindrance** for non-road mobile machinery manufacturers, as the technical differences are minor, but manufacturers need to keep track of the different requirements between Member States[24]. For example, there are different requirements for markings across Member States. These markings come in different sizes, colours, shapes. The manufacturer needs to ensure that the right markings are installed in the right place on the machines. This procedure is not technically challenging, but requires additional logistics, proper sequencing and high doses of precision. In addition, technical requirements also can be **contradictory** in areas such as markings, lights or warnings, where the requirements in terms of position, colour or shape may be different and overlap, creating contradictory requirements.

The other half of the current national technical requirements present a more **technical challenge** for implementation. For example, certain diverging requirements such as those related to braking are technically difficult to implement and require much more effort as they may require changes to the core design of the vehicle in question.[25] On complex technical requirements, what often happens is that some may be **more stringent**, rather than contradictory. For instance, on vehicle performance and control braking systems,

[23] Working document 'NRMM-2019.03 MS Targeted Consultation Feedback' summarising the findings of the targeted consultation done by the Commission on differences between member states approval for the road circulation of non-road mobile machinery. Available in the library section of the CIRCABC interest group "New legislative initiative - Road circulation approval requirements for non-road mobile machinery".

[24] "Study on the EU harmonisation of the requirements for the road circulation of mobile machinery". Page 36.

[25] "Study on the EU harmonisation of the requirements for the road circulation of mobile machinery". Page 36.

some countries require two braking systems, whereas other countries require three braking systems (service, parking, and emergency braking).[26]

Due to the lack of harmonisation at EU level, individual countries have issued specific requirements to address safety of non-road mobile machinery circulating on the road, and this has led to a situation where this kind of equipment may not be developed and produced in a single version to fulfil those requirements. Such non-harmonisation leads to entry **barriers to EU markets**, and **increased direct and indirect costs for manufacturers**. In fact, the multiplication of different requirements in the various EU countries obliges manufacturers to produce many versions of the same machine model in order to sell it within the EU. The effort to get familiarised and comply with multiple rules is proportionally bigger for SMEs than for large companies, particularly for those SMEs producing low volume but highly specialized export-oriented machines[27].

Depending on the market situation, these **costs may be passed on towards downstream clients**, preventing a level playing field for downstream clients, who do not have access to the same variety of products[28] and at the same prices across the EU[29].

In addition, also the use of non-road mobile machinery is reduced due to national requirements. For example, rural contractors or construction companies, which provide services in multiple EU countries, **may not be able to use their non-road mobile machinery across Member State borders,** due to the costs and regulatory requirements associated with the need to adapt to different rules for circulation in border countries.

Finally, feedback from stakeholders suggests that the different national legal requirements for the road approval result in **differences in the level of safety** requested between EU countries. Germany, Italy and France can be considered not only the main producers of non-road mobile machinery but also the most demanding Member States in

[26] Working document 'NRMM-2019.06 Technical requirements' summarising the findings of the targeted consultation done by the Commission on differences between member states requirements for the road circulation of non-road mobile machinery. Available in the library section of the CIRCABC interest group "New legislative initiative - Road circulation approval requirements for non-road mobile machinery".

[27] Inception Impact Assessment Feedback. Accessible from: https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/1198-Road-circulation-requirements-for-mobile-machinery/F8305_en.

[28] Anecdotal evidence collected in the impact assessment study carried out in 2016, suggested that this is not only the case in small markets (e.g., the Baltic States), but that this problem can also extend to larger countries, e.g., Spain or Italy which may be less interesting for a particular niche product. For example, it means that a beet or potato farmer in one country has access to the latest range of self-propelled harvesting machines, whilst his colleague from a neighbouring country does not have the option to purchase this product. This differentiated access to machinery can lead – ultimately – to differences in productivity of downstream producers across the EU. Phrased differently, a farmer in one country seeking for example an oilseed machine may be confronted with limited or no choice. Hence, this can lead to rent-seeking behaviour from monopolies or duopolies – which runs against consumer interests. In addition, it leads to an uneven playing field for competing companies from different Member States and hence reflects a malfunctioning of the Single Market.

[29] The impact assessment study carried out in 2016 showed that, prior to the introduction of harmonised requirements for tractors (Regulation (EU) No 167/2013), significant price differences have been observed between EU countries in the period between 2005 and 2011. The 7th Framework Programme project FACTOR MARKETS identified Germany as the market with the highest competition. Benchmarking prices in Germany with those in the Netherlands, the UK, Finland, France, Italy and Sweden for the same vehicle models, an estimated average of 10.3% price difference was identified with products being cheaper in Germany. Cross-border transport and red-tape costs were found to account for 4.4% of the price difference. The rest 5.9% was attributed to a combination of factors, most significant considered to be the market power of manufacturers and distributors in markets with a lack of competition, differences in demand, local distribution costs and to a lesser extend the impact of the market size on economies of scale. Considering the similar nature to the non-road mobile machinery sector, but accounting for the significantly smaller sector size, it can be reasonably assumed that intra-EU price differences for these mobile machines are at least equivalent to the one's previously found for tractors.

terms of road approval requirements. Other Member States still have comparatively lower requirements.

According to the costs and benefits study, under the current system, all stakeholders in the EU incur costs of just over **€6 billion over ten years**[30] to comply with, and to maintain the road safety requirements for non-road mobile machinery. Such costs are borne by three stakeholder groups: **€3 561 million (59%) by manufacturers and distributors**[31]**; €2 442 million (41%) by rental companies and end users**[32]**; and €23 million by MS authorities**[33]. Costs for MS authorities are limited in comparison with the other two. Out of 19 authorities responding to a targeted consultation carried out by the Commission[34], only 3 estimated a significant effort' to enforce new EU rules, corresponding to countries where road circulation rules are very loose or non-existing today.

- EU **manufacturers and distributors**[35] **(large enterprises and SMEs) are presently incurring compliance costs of approximately €3 561 million over ten years** to comply with the current safety requirements and to obtain the necessary certification and approvals for the road circulation of non-road mobile machinery, as defined in national legislation set by the Member States. Compliance costs for manufacturers and distributors were estimated at 4% of the industry's production value.

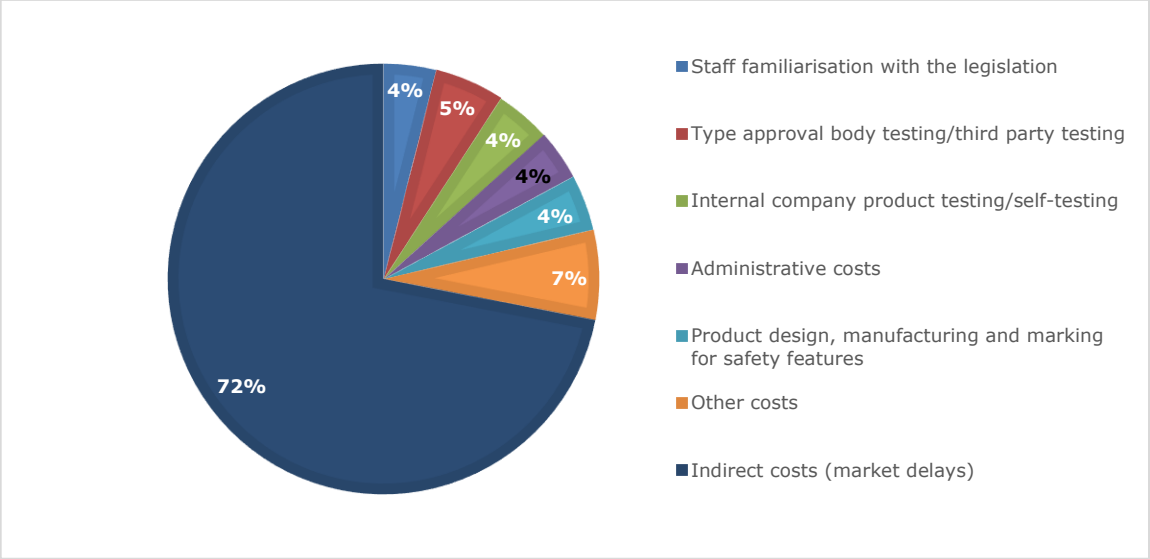
As seen in section 1, SMEs account for 18% of the NRMM market revenue, hence out of the €3 561 million compliance costs borne by manufacturers and distributors over ten years, at least €641 million are borne by SMEs.

The direct costs for manufacturers and distributors **account for 28% of total compliance costs**. However, the biggest cost are the **indirect costs, amounting to 72% of the total compliance costs,** which are mostly due to **market entry delays**[36]**.** As a result, of the total compliance costs estimated over ten years at €3 561 million, €2 564 million (72%) are indirect costs and €997 million (28%) are direct costs.

The figure below presents the breakdown of costs that manufacturers currently incur due to the non-harmonised system of homologation of non-road mobile machinery as shown in the costs and benefits study, classified as direct or indirect.

[30] The study considered 10 years as a reasonable timeframe to measure costs and benefits, since the life average life cycle of this type of machinery is not considered to be lower.
[31] Estimated at 4 % of the industry's revenue.
[32] Estimated according to the methodology explained in Annex I to this report.
[33] Estimated based on consultation to the authorities.
[34] Working document 'NRMM-2019.03 MS Targeted Consultation Feedback' summarising the findings of the targeted consultation carried out by the Commission on differences between member states approval systems for the road circulation of non-road mobile machinery. Available in the library section of the CIRCABC interest group "New legislative initiative - Road circulation approval requirements for non-road mobile machinery".
[35] For the sake of simplicity, in the report it is often used 'manufacturers' to refer to both 'manufacturers and distributors.
[36] This figure is significantly high. It was provided by a representative part of the industry, since the 2019 study gathered data from 39 manufacturers of non-road mobile machinery from 11 Member States, representing around 50 % of the total industry turnover, and extrapolated the results to the whole industry turnover. However, this figure could not be confirmed by other sources.

Figure 2. Manufacturers and distributors compliance costs composition at the baseline



Source: Cost and benefit study - PPMI analysis.

- **Direct costs** comprise recurring and one-off compliance costs. **One off compliance costs** include staff familiarisation with the legislation costs, type-approval body testing/third party testing costs, internal company product testing/self-testing costs and product design. **Recurring compliance costs** include the manufacturing and marking for safety features. **Administrative costs** relate to the road homologation administrative procedures and are estimated at **4%** of the total compliance costs.

- **Indirect costs** are measured by the costs incurred due to the market delays. The costs incurred by manufacturers due to market entry delays are the lost revenues of manufacturers who, after having completed production of a new machine model, cannot export it. Market delays can originate simply from the need to perform multiple procedures, for instance performing conformity assessment in several countries, storing production and waiting times before being able to export products. According to the industry, the indirect costs related to market delays are the biggest negative economic impact for them, because the lost revenues due to delays in market launches are directly impacting companies' sales and cash flow, which has stronger financial consequences than the direct compliance costs.

The market entry delays also lead to unpredictable delivery of machines. Due to the highly specialised and in some cases tailor-made aspects of the machinery, many manufacturers produce on-demand only. In the agricultural sector, this leads to strong cyclical peaks, e.g., orders are placed in winter and delivery is expected in the middle of the year, typically prior to harvesting. In such cases, delays in delivery can be more harmful than in a regular and more standard production and may result in machinery not being available in time for a particular construction project or the harvest, with production losses as a possible consequence for end users.

- ➢ EU **rental companies and end users presently incur costs of approximately €2 442 million over ten years** to comply with the current safety requirements for the road circulation of non-road mobile machinery and to obtain the necessary certification and approvals as defined by national legislation set by the Member

States (when this has not been dealt with by manufacturers or distributors). This amount includes both the direct and indirect costs.

The main direct costs for rental companies stem from: familiarisation with the legislation for the road approval of mobile machinery; technical and administrative procedures that include fixing national vehicle compliance or warning signs to meet national road safety requirements; modifying machinery or sending it back to manufacturers. The main indirect costs experienced by rental companies come from time delays due to having to follow the national road safety requirements for the machinery produced in other EU countries.

The main direct costs experienced by end users relate to the need to modify mobile machinery to meet national road safety requirements if manufacturers or distributors have not dealt with this. The main indirect costs for end users stem from lost earnings due to the delay and/or unpredictable delivery of machines.

- In total, all EU Member State authorities currently spend around **€23 million over ten years on the enforcemen**t of existing rules for the requirements of the road circulation of non-road mobile machinery. The enforcement activities usually include tasks such as granting the approval for non-road mobile machinery, market surveillance, vehicle conformity spot checks, and the removal and storage of non-conforming vehicles.

- **Technical services** were interviewed, although they were not included in the costs and benefit study calculations. The study found out that seven out of eight technical services interviewed claimed that the fee is determined based on the complexity of the product[37]. It is common practice that technical services also spend time and money to drive to the manufacturers' plants where they carry out the testing and/or inspection. According to the manufacturers' data, the average annual fee paid for third party testing and certification purposes by a manufacturer is approximately €82 000. Large manufacturers pay around €104 000 annually on average and SMEs pay approximately a third of what large manufacturers pay. Considering that SMEs sell on average 238 machines per year, which is only one-tenth the number of machines sold by manufacturers, SMEs pay a higher fee per machine than manufacturers and therefore experience higher cost burden compared to large firms.

To facilitate the definition of the problems encountered in the market of non-road mobile machinery, they have been split in distinct aspects below.

- **Problem 1: Barriers to market entry and market delays in the introduction of new machines**

As explained above, the cost and benefit study estimated that about **72% of the costs manufacturers face when getting multiple approvals are indirect costs due to market delays**, which could be spared if requirements would be harmonised and approvals would be done only once. The major driver of such costs is market delays. Most manufacturers and distributors expect reduced delays under a harmonised system. However, none of them believes that the delays will be cut out completely.

[37] "Cost/benefit analysis study for Impact Assessment on road circulation of Non-road mobile machinery". Page 34.

In practice, before the non-road mobile machinery is put on the market, the manufacturer must complete the necessary national approval procedure, also known as 'homologation', which in some countries requires third party verification, to certify that the design and construction respect the requirements stipulated in the national legislation.

Because the requirements for homologation are different between EU countries, manufacturers need to complete the homologation process in each country in which they plan to market their new models of machinery. This creates **market entry delays** and a consequent significant delay in return on investment for the manufacturer. While large manufacturers are seen as being able to cope with such complexity to cover the whole EU, even if at a higher cost[38], SMEs producing low volume highly specialized machines perceive such differences often as **entry barriers** and thus focus on their home countries[39].

According to manufacturers consulted in the costs and benefits study, the biggest problem is the delays in making profit out of new machine models, caused by the need to go through **lengthy homologation processes** in various countries. During the interviews with the manufacturers, it emerged that market delays occur when a manufacturer has to adapt machinery to comply with the regulations in other countries. They can also face delays while waiting for national approvals once they reach another EU Member State. The end users, in turn, suffer delayed and/or unpredictable delivery time of machines. Due to the highly specialised and in some cases tailor-made aspects of the machinery, many manufacturers produce on-demand only. Clients are often requested to make up-front down payments and, in advance of the receipt of their ordered products, they prepare time specified plans for the use of their machinery. However, as mentioned already, road approval requirements can lead to delays in delivery, which can result in machinery not being in time for a particular construction project or the harvest, with production losses as a possible consequence. This problem is especially acute for some products subject to strong seasonality, as it is often the case in the agricultural sector.

- **Problem 2: High compliance costs for companies**

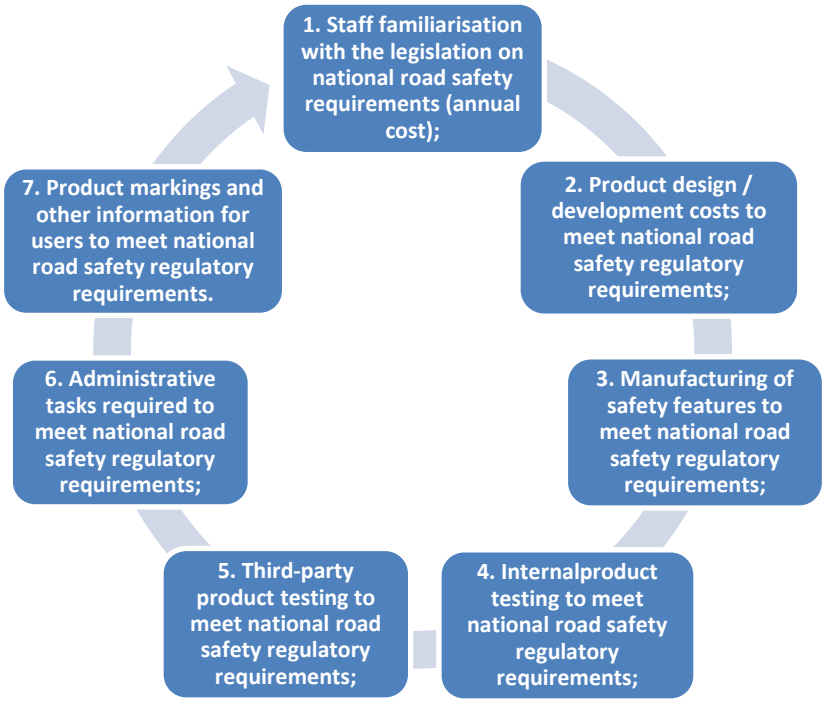
Manufacturers are usually responsible for the homologation of series production machinery, which covers most of the cases. However, for individual approvals, homologation can be undertaken either by the manufacturer or by the owner/end user.

The cost and benefit study estimated that about **28% of the costs manufacturers face when getting multiple approvals are direct costs of compliance to divergent or multiple requirements**, i.e., could be significantly reduced if requirements would be harmonised and approvals would be done only once. The figure below depicts the key compliance activities that generate direct costs to industry.

Figure 3. Road approval compliance activities

[38] Delays on profitability until the various road approvals are completed in every EU country.

[39] Inception Impact Assessment Feedback from FEDERUNACOMA (Italian Agricultural Machinery Manufacturers Federation). Available at: https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/1198-Road-circulation-requirements-for-mobile-machinery/F8305_en.



➢

On design and manufacturing costs, to meet the different homologation requirements in every EU country, manufactures are often bound to adopt different designs of their machinery parts in order to conform to those various national rules. This results in increased costs, which may be passed further down the supply chain until the final user. This also leads to companies limiting their investment in innovation. As an example, non-road mobile machinery designs need to consider different requirements for lighting. In France, lights often need to be designed to fold, or remain in a position where they are more likely to not be damaged when the machinery is in use. Other countries require R65-R10 beacons. It is difficult to design a machine according to ISO visibility standards and at the same time according to each specific national road requirement further testing or technical requirement[40].

The efforts required for type-approval in some Member States can be very high. Here below are reported examples of three member states[41]:

- ❖ In Germany: In order to be able to apply for national type-approval, the manufacturer or dealer needs to provide information about ISO9002 equivalent standard to the road approval body (initial procedure). The technical service asks the manufacturer for the provision of written information on the machine, specific designs and testing results that indicate that there is conformity with existing regulations[42]. Moreover, independent tests are carried out to evaluate the results. The technical service test report based on the company's information is the document that is transferred to the public administration responsible for the national road approval regulation. The procedure is concluded if this public body decides on the road approval of one specific type of off-road machines.

[40] "Study on the EU harmonisation of the requirements for the road circulation of mobile machinery". Page 35.
[41] Inception Impact Assessment Feedback from FEDERUNACOMA (Italian Agricultural Machinery Manufacturers Federation). Available at: https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/1198-Road-circulation-requirements-for-mobile-machinery/F8305_en.
[42] KBA (2016): http://www.kba.de/DE/Fahrzeugtechnik/Typgenehmigungen/typgenehmigungen_node.html; Interview with manufacturer.

- In Italy, third party testing is carried out by the relevant regional office of CPA[43], a public authority under the Ministry of Transport. The Ministry of Transport checks the report of the regional CPA bureau. If the Ministry of Transport decides on the road approval, this decision is binding for the whole country. In addition, every two years an audit by an organisation appointed by the government takes place in order to review the management system of the manufacturer.

- In Sweden: The manufacturer of the machine has to provide a certain amount of technical documentation and certification that systems and components fulfil the requirements of the legislation and must certify that the machine complies with applicable legislation[44]. Additional extensive practical tests are to be conducted at the discretion of the technical service and paid by the manufacturer. The assigned type designation has to be reported to Swedish Road Authorities as a basis for registration.

Granting road approval for highly specialised machines requires specific expertise, which is not always available at the authorities concerned; it can lead to delays and less prioritisation of the files. Such delays can last up to 6 months or even several years in certain instances [45]. Such delays are problematic especially for smaller players, who might not be able to engage in such an administrative exercise for a long time. As a result, they might focus on home markets. This could lead to limited choice of machines and less competition in the European market.

Different requirements lead to different costs, and these would likely be passed on to consumers[46]. Based on the higher costs (and depending on the pass-on capabilities), downstream clients will need to purchase products at **higher prices**. The costs borne by manufacturers to launch their new machines in each EU country lead (depending on price elasticity) to downstream clients purchasing machines for higher prices.

In addition to the higher general prices, the barrier to market entry may also introduce a **differentiation of sales prices between EU countries**[47]. As an example, prior to the introduction of harmonised requirements for tractors (Regulation 167/2013), significant price differences were observed between EU countries in the period between 2005 and 2011. An analysis carried out in 2013 compared prices in Germany, Netherlands, the UK, Finland, France, Italy and Sweden for the same vehicle models, and estimated an average price difference of 10.3%. Cross-border transport and red tape costs accounted for 4.4% of the price difference. Considering the similar nature of the non-road mobile machinery sector, but accounting for the significantly smaller sector size, it can be reasonably assumed that intra-EU price differences for these mobile machines are at least equivalent to the ones previously found for tractors. Industry testimonials confirm the existence of higher prices and price differentiation due to the lack of harmonised rules.

A further reason behind higher and different consumer prices for the same products is related to production and **stock management** issues. Whilst certain non-road mobile

[43] Centro Prova Autoveicoli (Vehicle Testing Center)
[44] SMP Swedish Machinery Testing Institute (2016): https://www.smp.nu/en/Inspection/Services/WorkEnvironment/Import/Sidor/default.htm
[45] "Study on the EU harmonisation of the requirements for the road circulation of mobile machinery". Page 30.
[46] Manufacturers typically sale the machinery to dealerships (wholesale), which in turn sale it to the customers (retail sale). Customer can be rental companies, contractors or individual end users.
[47] Inception Impact Assessment Feedback from CEETTAR (European Organisation of Agricultural, Rural and Forestry Contractors). Available at:https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/1198-Road-circulation-requirements-for-mobile-machinery/F8305_en.

machinery manufacturers are producing on demand only, others are producing in large series. This requires detailed production planning, and detailed forecasts about sales volumes for each product in each market. If these forecasts prove incorrect (which is not unusual), stocks of machinery for certain countries can pile up whilst there may be shortage of machinery originally planned for export to other countries. This will require the manufacturer to either manage this stock (with capital costs incurred as a result) or reconfigure the machinery to adapt it other countries rules (e.g., from a machine destined for the French market to one for the German market). Both options lead to higher costs and inflate production prices, which maybe passed-on to consumers.

This differentiation in product specification and pricing also has a bearing on **second-hand market** prices, as non-road mobile machinery homologated in one country can be difficult to resell in another country without substantive modifications. This may lead to price decreases for second-hand machines[48], especially in smaller markets where a second-hand market for specialised pieces of machinery is sometimes non-existent given the high homologation costs.

A further consequence for clients, triggered by the above-mentioned indirect industry costs, is a **limited access to certain machines**. A farmer in one country has access to the latest range of machines, whilst his colleague from a neighbouring country does not have the option to purchase this product. This differentiated access to machinery can lead ultimately to differences in productivity of downstream producers across the EU. In addition, it leads to axn uneven playing field for competing companies from different EU countries and hence reflects a malfunctioning of the single market.

Because of the high compliance costs for companies, manufactures may reduce investment in product innovation, and this could contribute to the existence of sub-optimal products. Manufacturers are likely to stick to design solutions that work and have been approved in several Member States, rather than innovate on designs and risk expensive, and time consuming, new homologation procedures. Consequently, downstream clients are often in the position where the latest technological advanced machines are not offered in their markets. This reduces the productivity and safety of the users and thus affects their competitiveness.

- **Problem 3: Difficulties in the use of machinery across intra-EU borders**

In addition to the indirect costs associated with the homologation of the vehicle itself, the use of non-road mobile machinery itself can be reduced due to national requirements. For example, for rural contractors or construction companies which provide services in multiple EU countries (such as the harvesting of crops for others, or the renting of construction equipment, etc.), the use of non-road mobile machinery across different borders is not always possible.

Stakeholders indicate that in some cases there have been difficulties for construction service providers to take non-road mobile machinery across borders for projects in other EU countries as a result in differences in the national road safety requirements[49]. As a

[48] Inception Impact Assessment Feedback from CEETTAR (European Organisation of Agricultural, Rural and Forestry Contractors). Available at: https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/1198-Road-circulation-requirements-for-mobile-machinery/F8305_en.

[49] Inception Impact Assessment Feedback from CEETTAR (European Organisation of Agricultural, Rural and Forestry Contractors). Available at: https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/1198-Road-circulation-requirements-for-mobile-machinery/F8305_en.

result, it is sometimes more cost effective for service providers to hire compliant non-road mobile machinery in the relevant country where the project is taking place[50]. Alternatively, machinery is moved between workplaces on trucks, without road approval.

However, a quantification of these problems was not possible.

- **Problem 4: Need for authorities to adapt technical provisions**

The current situation obliges each of the EU countries road approval authorities to set up and maintain specific legislation on requirements for the road approval of non-road mobile machinery, whenever there is an evolution in the start of the art. This, however, is seen as a minor problem even by the authorities themselves since they are already handling several approval processes for different types of vehicles. Therefore, it does not translate into a specific objective of this impact assessment.

- **Problem 5: Unequal requirements and technical solutions for the road safety of non-road mobile machinery in the EU**

Feedback from stakeholders suggests that different national legal requirements for the road approval result in differences in the level of road safety between EU countries, but does not prove it, due to the lack of granular data. Indeed, several Member States responding to the consultation highlighted the lack of specific statistics on road safety of non-road mobile machinery (e.g., countries accident statistics include tractors and non-road mobile machinery). And even when specific statistics do exist, the data rarely allows for the identification of the vehicle types involved and the causes of the accident. Annex 2 provides road accident statistics including non-road mobile machinery received from Member States.

Nevertheless, during the public consultation, 36 out of 74 respondents replied they were aware of accidents linked to non-road mobile machinery circulating on public roads in their country, among which 31 respondents referred to road accidents that led to the personal injury of one or more persons. Respondents also mentioned knowledge of specific accidents related to movement and manoeuvring of heavy equipment, such as street sweeper trucks and larger construction equipment. The accidents appear to be caused by a lack of visibility when in motion because the operational devices are located under the cab or behind the driver, or related to manoeuvring operations that require constant reversing. Other accidents appear to be related to stability issues and braking failure. Annex 2 includes a list of vehicle features that were mentioned during the public consultation as a cause or a contributor to these accidents.

In addition, the Dutch Safety Board informed about an analysis done in the Netherlands in 2010. Such analysis established then that the width of the construction vehicle, in combination with narrow roads, is a major cause of accidents, as well as the fact that the driver's view is often blocked by parts of the vehicle, tools or charge. In addition, the Dutch Safety Board concluded that the visibility and recognizability of agricultural vehicles in the dark could be a problem. These conclusions are based on an in-depth investigation of 11 serious accidents (in which a serious road injury or death occurred) and the study of 73 fatal accidents involving agricultural vehicles[51].

[50] "Study on the EU harmonisation of the requirements for the road circulation of mobile machinery". Page 58.
[51] https://www.swov.nl/feiten-cijfers/factsheet/landbouwverkeer (in Dutch)

Over a period of ten years (2006-2015), an average of 11 road deaths per year in the Netherlands were registered in accidents involving agricultural vehicles. Compared to the early 1990s, the average number of road deaths resulting from accidents involving an agricultural vehicle increased from 1% to 2% of the total number of road deaths in the Netherlands. Agricultural vehicles include agricultural and forestry tractors (tractors) as well as self-propelled work equipment used for agriculture, construction, ground, road and hydraulic engineering and green maintenance. Due to ever-increasing scaling up in agriculture, companies own more and more lots spread over a larger area, which means that their agricultural vehicles travel greater distances on public roads.

Although the accidents reported have not been documented as caused by diverging legislation, a set of technical requirements agreed by all EU countries would likely increase and level the road safety of non-road mobile machinery across the EU. Indeed, because of the lack of available data and personal experiences with accidents, none of the manufacturers and distributors interviewed were certain about the positive impact of harmonisation on road accidents. However, from a normative point of view, most of the participating technical services, and almost half of the Member State authorities, believed that having a harmonised system could raise standards and decrease NRMM road accidents in Europe.

It must be noted that **some Member States limit the road circulation speed for non-road mobile machinery at 40 km/h**, for safety reasons. As regards potential **damage of road infrastructure**, the relevant requirements are the maximum axle loading and the maximum surface contact pressure of tyres and/or tracks. However, no particular concerns have been raised in this area.

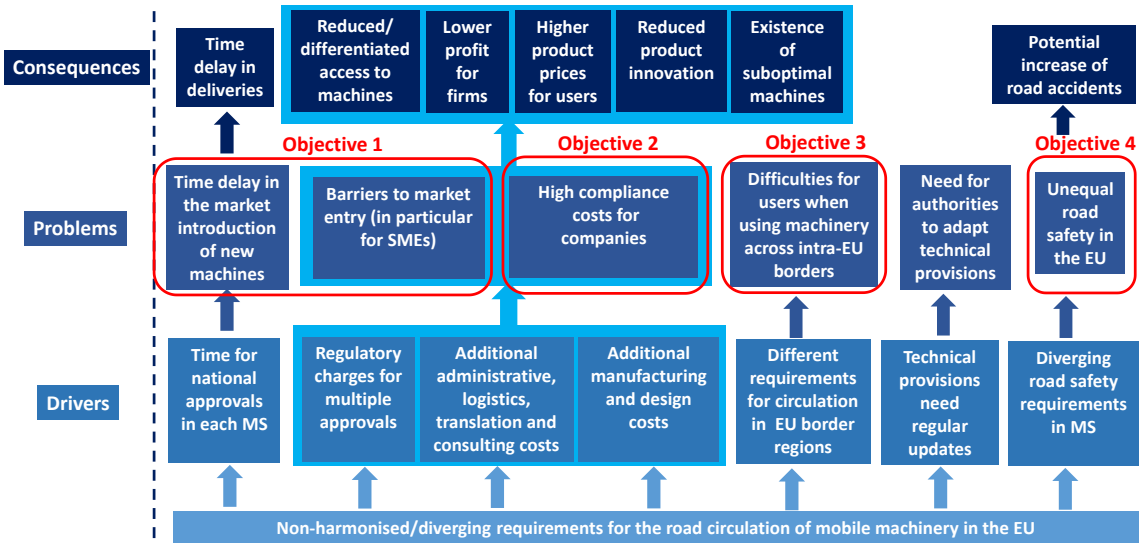
Differences in rules will continue to widen as has happened over the years, since it has been observed that Member States with stringent road approvals have gradually adapted them following the path of other type-approval legislation, while countries with looser legislation do not tend to make them more stringent. Therefore, in the absence of a policy intervention, a market-driven evolution towards standardisation for an improved safety across the EU would not spontaneously happen. On the contrary, a harmonised policy would allow manufacturers' competitive strategy to take advantage of economies of scale, by precisely aligning their models to best available standards without any 'technical contradictions' imposed by national legislations.

As explained earlier in this section, technical requirements can be contradictory in areas such as markings, lights or warnings, where the requirements in terms of position, colour or shape may be different and overlap. Alignment of machinery models to best available standards is happening on functional safety, ruled by the Machinery Directive, but not on road safety, precisely due to diverging requirements.

2.2. What are the problem drivers?

The problem drivers were explained in section 2.1 together with the problems. A summary is presented here below.

Figure 4. Problem tree



2.3. How will the problem evolve?

If no EU-wide action were taken, Member States would continue setting and updating their own national road safety legislation for non-road mobile machinery, and the divergences would remain and likely increase, as they have been doing over the years. Indeed, several Member States have been aligning some of their procedures for non-road mobile machinery to what is done for other vehicles, while other Member States have taken no particular steps in that sense. In addition, in some Member States national acts are different per sector, e.g., for agricultural and construction equipment. Therefore, the already high burden and cost for manufacturers to have an up-to-date overview of requirements and to comply with them in each MS would likely rise further in the future. In addition, the road safety standards would remain suboptimal.

3. WHY SHOULD THE EU ACT?

3.1. Legal basis

The present initiative would be based on Article 114 of the Treaty on the Functioning of the European Union, and is fully justified since it aims to harmonise the existing different regulatory regimes in the 27 Member States and improve the functioning of the internal market.

The different regulatory regimes in the Member States have created discrepancies in the single market, adding economic and administrative burden and creating barriers for the free circulation of non-road mobile machinery.

The harmonization of the safety rules for the road approval of non-road mobile machinery can be done only at the EU level and is expected to reduce the administrative burden and provide a high degree of safety on the public roads.

3.2. Subsidiarity: Necessity of EU action

The internal market is a competence that is shared between the Union and the Member States in accordance to Article 5 TEU. The principle of subsidiarity requires in particular that the Union shall only act if, and in so far as, the objectives of the proposed action

cannot be sufficiently achieved by the Member States, but can rather by reason of scale or effects proposed action, be better achieved at the Union level.

Currently, the technical requirements for road approval of non-road mobile machinery and the respective approval procedures are decided at Member State level. This legislation set by Member States often differs and manufacturers selling on several markets are obliged to vary their production according to the Member States for which their products are intended and have their vehicles tested in every Member State, which is time consuming and costly. Different national rules consequently hinder trade, and have a negative effect on the establishment and functioning of the internal market.

It is therefore important to approach the homologation framework for these machine vehicles at EU level. This initiative contributes to a more complete internal market for non-road mobile machinery and to a high and equal level of road safety across Europe, and is therefore in line with the subsidiarity principle set out in Article 5 TEU.

3.3. Subsidiarity: Added value of EU action

Without EU intervention, the single market will remain fragmented, and requirements will continue to be formulated at national level, leading to ever widening differentiation in road approval requirements for non-road mobile machinery across the EU.

Acting on the homologation framework for non-road mobile machinery at EU level is an important means to achieve a fairer and deeper internal market for the sector. These results could not be achieved to a comparable degree by national legislation because the fragmentation in approaches by different national /regional legislation, creates a barrier entry to other EU countries, as manufacturer have to customise their products adapting them to the specific national requirements in each country.

4. OBJECTIVES: WHAT IS TO BE ACHIEVED?

4.1. General objectives

The general objectives are:

General Objective 1: Ensure the free movement of non-road mobile machinery within the single market by filling an existing regulatory gap in the single market of non-road mobile machinery as regards road approvals; and

General Objective 2: Increase road safety in the EU.

4.2. Specific objectives

The specific objectives are:

- **Specific objective 1: Eliminate barriers to market entry (in particular for SMEs), and reduce market delays in the introduction of new machines**

This objective focuses in reducing the current manufacturer's market delays in the introduction of new machines in the EU countries, and thus lowering the market barriers, and as a result would favour intra-EU trade of machinery and improve the functioning of the internal market. The reduction of market delays would improve companies'

profitability, which may in turn reduce their prices and improve their competitiveness inside and outside Europe.

Less market barriers would ensure an equal level of access to goods for all users, and a greater variety of machinery available in the EU market, at potentially lower prices for the benefit of users in all sectors involved (agricultural, forestry, construction, garden and municipal machinery).

- **Specific objective 2: Reduce compliance costs, and facilitate product innovation**

This objective focuses in avoiding multiple homologations, and thus reducing the current manufacturer's multiple compliance costs (such as manufacturing, design, logistics, administrative, translation and consulting costs) generated in each of the EU market where they decide to market their non-road mobile machinery. Consequently, companies may free more resources for product innovation and may lower their market prices, increasing their export ability within and outside the EU, and improving the functioning of the internal market.

- **Specific objective 3: Facilitate use of machinery across intra-EU borders**

This objective focuses in allowing the use of machinery across intra-EU borders, in the many border areas existing within the EU, for the benefit of rental companies and contractors working in such areas.

- **Specific objective 4: Ensure high and equal requirements and technical solutions for the road safety of non-road mobile machinery across the EU**

The objective of guaranteeing a high standard of road safety across the EU would create an opportunity to enhance the safety level required in some member states.

In theory, road safety would require just sufficiently **high** requirements. In practice, however, complying with such requirements by the manufacturers, as well as ensuring their enforcement by the relevant authorities, would be very much facilitated by having **equal** requirements across the EU.

Each of the vehicle features that are relevant for road circulation (vehicle masses, dimensions and structure, vehicle performance & control, road surface protection, vehicle awareness, operator vision) needs to be regulated. Once there is agreement at technical level on what should be requested considering the state of the art, there is not much room for deviations.

5. WHAT ARE THE AVAILABLE POLICY OPTIONS?

The policy options defined as possible answers to achieve the objectives, based on the problem analysis, range from no EU intervention (i.e., 27 sets of national legislation), to mutual recognition, harmonising legislation according to the 'new approach' and the introduction of an EU road type-approval for non-road mobile machinery.

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

Mutual recognition is not part of the baseline. Member States do not generally accept other Member States' road approvals in their territory, because of the highly technical and politically sensitive nature of this area, and because of the quite different systems currently existing the EU.

The current compliance costs borne by manufacturers, distributors, rental companies, end users, and Member State authorities were explained in section 2.1. In the absence of EU action, these unnecessary costs due to multiple legislation for one same purpose will persist. Manufacturers will bear more and more the costs and burden to be familiarised and comply with 27 sets of road safety legislation. As a result, manufacturers would decrease profitability and investment in innovation, hence minimising competitiveness inside and outside the EU.

Since the baseline means no EU action, road approval authorities would continue to issue and update legislation in each EU country, likely leading to 27 increasingly diverging systems for road homologation. For Member States introducing more stringent rules over time, costs would even increase in the baseline option. Therefore, manufacturers and distributors would continue bearing the compliance costs mentioned in section 2.1, if not more, to be familiarised and comply with these various road safety rules. As a result, manufacturers and distributors would suffer decreased profitability, reduced investment in innovation and general loss of competitiveness inside and outside the EU.

A similar effect will take place on rental companies and end users, for which costs would also increase in the baseline option. Differences in legal treatment of the same machinery by different Member States in the internal market entails legal uncertainty for manufacturers and end users which is likely to reduce free circulation of this type of machinery in the internal market. The barriers to enter the market and the decreased profitability of manufacturers and distributors may lead to less variety of machinery types and versions for rental companies and end users, as well as to price increases for the available machines. In addition, application of different national rules for cross-border use of the machinery is likely to continue to cause administrative burden to end users.

As regards the EU Member State authorities, with no EU action, road approval authorities would continue to issue and update legislation in each EU country, likely leading to 27 increasingly diverging systems for road homologation. They will have the burden to adapt the national technical provisions to the technical progress. Some authorities noted that this was a significant effort, since approval authorities in charge to check the entire technical file need to have the competency for all types of different machinery and different very specific technical aspects.

In absence of EU action, Member States that currently require technical services' involvement for the road approvals will continue to do so, while others with simpler systems not requiring their involvement will likely not involve them in the future.

As regards **competitiveness**, no action will be detrimental for companies' profitability and innovation, and will keep market prices up, hence diminishing the competitiveness of the sector.

In relation to **the single market**, multiple diverging road approvals negatively affect the free movement of non-road mobile machinery, thus creating a gap in the single market and restrains the availability of machinery models in the market. Moreover, it hinders the cross-border use of non-road mobile machinery.

As regards **road safety**, road approval authorities would continue to issue and update legislation in each EU country, likely leading to 27 increasingly diverging systems for road homologation. Road safety may increase in those countries revising their own national systems towards more stringent options; however, this may not happen in the EU as a whole.

On environmental impacts, currently there is no uniform noise emission limits for the road circulation of non-road mobile machinery. Noise might be decreased in those countries revising their own national systems towards more stringent options, but this will not happen in the EU as a whole.

Overall, in a baseline scenario without EU policy, safety requirements of the design and manufacturing of non-road mobile machinery intended to travel on public roads would continue to differ in each Member State.

5.2. Description of the policy options

- **Policy option 1. EU approval of the entire mobile machine granted by Member States authorities ('old approach' type of legislation).**

This policy option follows the principles of the EU legislation on vehicles e.g. Regulation 167/2013 on the approval of agricultural and forestry vehicles.

Besides the general requirements e.g. administrative, functional safety, conformity assessment, the technical specifications to comply with the general requirements are also integrated in the legislation.

The conformity assessment process includes testing of the products and issuing a certificate of conformity. To perform the testing of the products, the manufacturer should either involve a third party (most of the cases) which is a competent laboratory called "technical service" or do it in-house. More specifically, third party involvement would be required for the conformity assessment of either safety critical parts (e.g. breaking, steering) or both safety critical and non-safety critical parts.

After performing the conformity assessment process, the manufacturer will ask the **final approval for the whole non-road mobile machinery to the Member State authority**, which will issue a 'EU type-approval certificate' if all requirements are met. Following to this, for every machine produced of that type, the manufacturer must issue a document called 'certificate of conformity', which certifies that the produced vehicle conforms to the approved vehicle type.

Under this system, the market surveillance authorities from Member States will check on random basis the effective compliance of products to the approved type.

Overall the manufacturer must carry out the following steps: apply the relevant technical requirements, carry out the tests involving a third party body or not, compile the technical file of the product, obtain the EU type-approval from the Member States' authorities and issue a certificate of conformity.

The new EU **legal act would include all technical specifications** for components, systems and separate technical units like for other motor vehicles.

This policy option includes two alternatives:

1.a) Type-approval:

For most components, systems and separate technical units the road approval (i.e., conformity assessment) would involve a third party (independent authorised body).

This is the case in the current legal framework for vehicles, such as passenger cars[52].

1.b) Simplified Type-approval:

For components, systems and separate technical units that are more critical for road safety (e.g., braking and steering), the conformity assessment would involve a third party (independent authorised body).

For components, systems and separate technical units that are less critical for road safety (e.g. lights, mirrors), the conformity assessment would be based on reports or self-certifications by the manufacturer.

For components, systems and separate technical units that are relevant for occupational safety only (e.g. cab ventilation and filtration system, roll-over protective structure, falling-object protective structure), no requirements will be set up under the new regulation, since such features are covered by the Machinery Directive.

This is the case in the current legal framework for 'R' and 'S' categories under regulation 167/2013[53].

- **Policy Option 2. CE marking of the entire mobile machine granted by the manufacturer ('new approach' type of legislation).**

This policy option follows the principles of the new approach EU legislation for the non-road use of non-road mobile machinery (e.g. Machinery Directive), where only the essential safety requirements are embedded in the law, but not the detailed technical specifications. Such detailed technical specifications may be found in related harmonised standards, the references of which, if published in the OJEU, give presumption of conformity with the legislation. Harmonised standards are voluntary. In alternative, other technical solutions can be proposed by manufacturers, such as ISO standards, or own specifications, as long as they prove that their level of safety is at least equal to the one granted by a full application of all relevant harmonised standards.

[52] Regulation (EU) 2018/858 of the European Parliament and of the Council of 30 May 2018 on the approval and market surveillance of motor vehicles and their trailers, and of systems, components and separate technical units intended for such vehicles, OJ L 151, 14.6.2018, p. 1–218.

[53] R (agricultural trailers) and S (agricultural interchangeable towed equipment) in Regulation (EU) No 167/2013 of the European Parliament and of the Council of 5 February 2013 on the approval and market surveillance of agricultural and forestry vehicles.

The manufacturer must perform the following steps. i) Apply the essential and detailed safety requirements related to the risks (e.g. braking performance, steering, visibility, etc.) ii) Carry out the testing of the product following the relevant detailed technical specifications; iii) Compile a technical file; iv) Issue a declaration of conformity; and v) Affix the CE marking that indicates the compliance of the product with the legal framework requirements.

Under this system, the market surveillance authorities from Member States will check on random basis the effective compliance of products placed on the market.

It is a system largely based on self-declaration by manufacturers, who then affix the CE marking on the machinery to indicate that the machinery conforms to the provisions of the legislation, and where there is no obligation to involve a third party[54]. This is the "new approach" type of legislation and is used for example in the Machinery Directive.

The options 1a, 1b and 2 can, in principle, be implemented through either a directive or a regulation.

Each of these options includes three aspects to be further assessed:

- **<u>Mandatory or not:</u> The new legislation may be:**
  - **Mandatory.** Replaces the current 27 national rules[55]. All member states would introduce the new harmonised system, which will replace their current rules for homologation of non-road mobile machinery. Manufacturers will need to do the road approval for a new model only once, and in one EU country, and will be able to sell their machinery EU wide; **or**
  - **Optional.** An alternative to the current 27 national rules[56]. Member States would introduce the new harmonised system, but would keep their current rules for homologation of non-road mobile machinery; hence, they would manage a double approval system. Manufacturers can choose whether to apply for the EU road approval for a new model only once, in one EU country, and sell it EU wide, or continue using the national approvals in the countries where they sell their machinery.

- **<u>Scope (propulsion):</u> The new legislation may include (or not) towed equipment.**
  - **Cover both self-propelled and towed machinery:** The new legislation would cover not only self-propelled but also the towed machinery**; or**

[54] Some 'new approach' legislation require the involvement of a third party (competent laboratory), so called "notified body". For instance, it is always requried in case of a lift under the Lifts Directive. In the case of the Machinery Directive, the involvement of a notified body is required only for certain machinery (listed in Annex IV of the directive) and only if harmonised standards do not exist or the manufacturer has chosen not to follow them. Annex IV of the Machinery Directive includes machinery considered to have a high risk factor (e.g. because they are manually loaded/unloaded, hand held, hand fed, portable, etc.) or which serve a critical protective function (e.g.guards, ROPS, FOPS, logic units to ensure safety functions, etc.). Mobile machinery is not included in Annex IV at this stage. Other 'new approach' legislation, such as the Low Voltage Directive, do not require at all the involvement of a notified body. In this impact assessment, option 2 does not require the involvement of a notified body, since non-road mobile machinery are not listed in Annex IV of the Machinery Directive.

[55] As in Reg. 167/2013 for tractors (categories T1, T2 and T3).

[56] As in Reg. 167/2013 for agricultural trailers (category R), agricultural interchangeable towed equipment (category S), track-laying tractors (category C) and special purpose wheeled tractors (categories T4.1 and T4.2).

- **Cover only self-propelled non-road mobile machinery:** The new legislation would cover only self-propelled machinery, since there is a number of EU type-approval legislation covering already towed vehicles, such as the categories O (trailers), R (agricultural trailers) and S (agricultural interchangeable towed equipment).

- **<u>Scope (speed)</u>: The new legislation may limit (or not) the scope to non-road mobile machinery with a maximum design speed not exceeding 40 Km/h.**
  - **Cover all-speed non-road mobile machinery.** The new legislation would cover all speed self-propelled machinery, **independently of the maximum design speed**, hence also faster non-road mobile machinery will be subject to a harmonised approval system; **or**
  - **Cover only non-road mobile machinery with a maximum design speed up to 40 Km/h.** The legislation would cover only slow non-road mobile machinery. 40 km/h is also the speed beyond which technical requirements become more stringent. In addition, some Member States have established a road circulation speed limit for non-road mobile machinery at 40 km/h.

Annex 5 to this report details the vehicle features that must be regulated in order to ensure safety on the road, which would be the same for all options. Both the technical specifications in option 1 or the essential safety requirements in option 2 would relate to this list of vehicle features detailed in Annex 5 as being relevant for road safety. This list was developed based on current national solutions and discussed with the working group created for this initiative[57], including industry and user associations, Member States authorities and their technical services. Due to the very technical nature of these vehicle features, there are no real policy choices to be made on them.

The assessment of the mandatory/optional legislation and scope choices are not assessed as included in the main options, but separately.

5.3. Options discarded at an early stage

The following options were discarded at an early stage:

- **Mutual recognition of existing national legislation**. The homologation of a non-road mobile machinery in one EU country under current national rules would be granted if homologation was already granted by another EU country, even if the rules complied with in both countries are divergent. Mutual recognition applies to products that are not subject to EU harmonisation legislation or only partly covered by it; this is the case, for example, of a wide range of consumer products such as textile, footwear, childcare articles, jewellery, tableware or furniture. [58]

  The external study carried out in 2016 analysed the possibility of mutual recognition for the sector. Mutual recognition would require that trust exists in

[57] CIRCABC interest group "New legislative initiative - Road circulation approval requirements for non-road mobile machinery".

[58] SWD(2017) 471: Impact Assessment Accompanying the document Proposal for a Regulation of the European Parliament and of the Council on the mutual recognition on goods lawfully marketed in another Member State. Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52017SC0471&from=EN

the requirements of other Member States, and that there is some conversion rather than divergence between EU countries. With the current diverging rules, Member States with more stringent requirements would very unlikely recognize and accept on their market non-road mobile machinery complying with less strict requirements. Moreover, if such a mutual recognition system were ever agreed by Member States and put in place, companies could try to obtain approval in countries with less stringent requirements ("shopping" certificates at preferred authorities), which would be undesirable for a proper functioning of the system. For more details, see "Study on the EU harmonisation of the requirements for the road circulation of non-road mobile machinery"[59].

As a result, this policy option was discarded early in the process. It appeared in itself to be attractive, as it would not require harmonisation at an EU level. However, since current requirements are quite diverging among Member States, and road safety is considered of great importance, national road approval authorities were very protective of their systems, and appeared to lack trust in the requirements of other Member States, reducing the feasibility of actual mutual recognition and hence the potential gains.

- **Hybrid approach with a mix of 'new approach' and 'type-approval' legislation**. A new EU legal act would include all technical specifications for components, systems and separate technical units that are more critical for road safety, whereas for systems and separate technical units that are less critical for road safety, the technical specifications would be detailed in harmonised standards.

  This option was explored, despite the complexity of combining two different approaches to safety legislation. However, during several discussions and workshops with stakeholders, and during the public consultation, it appeared clearly that all stakeholders (including road approval authorities and industry) considered a hybrid option as too complex and difficult to implement, hence not worth pursuing[60].

6. WHAT ARE THE IMPACTS OF THE POLICY OPTIONS?

The impacts linked to this initiative are mainly economic and social. The are no significant environmental impacts linked to this initiative.

The analysis of impacts in this section (and the cost estimates provided in section 2.1) is based on the costs and benefits study. Based on the study survey data, the potential costs were calculated under each of the policy options.

It was assumed that only direct costs differ across policy options. Indirect costs (measured though the cost of market delays) were assumed to be equal for all policy options as they relate to divergent requirements.

A key finding of the costs and benefits study was that **the introduction of harmonised legislation would reduce the costs of compliance (direct and indirect) by around one**

[59] "Study on the EU harmonisation of the requirements for the road circulation of mobile machinery". Page 68.
[60] Public consultation outcomes available at: https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/1198-Road-circulation-requirements-for-mobile-machinery/public-consultation_en.

fifth, proving that a significant cost saving could be achieved through EU action. Manufacturers, distributors, rental companies, and end users could **save from 18% to 22% of their compliance costs, depending on the selected policy option** (more details will be presented later in this section under each of the policy options, and in Annex 4). This roughly translates **into €1 to €1.3 billion over ten years**. That is to say, the sheer benefit of having to go through one single approval as opposed to several approvals in different countries, would make the biggest difference in terms of cost savings and burden reduction for the industry. The reason for this is that the biggest costs are indirect, as explained in the previous section. Such costs, derived from market delays, will be importantly reduced from the moment the approval system is a unique one across the EU.

6.1. Policy Option 1.a – Type-approval

The policy options in the costs and benefit study were not the same as in this report. Option 1a in this report corresponds to 'option 1a sub option a' in the costs and benefit study carried out in 2019[61].

6.1.1 Economic impacts

6.1.1.1 Impact on manufacturers and distributors (large enterprises and SMEs)

Option 1a is the most expensive policy option, where a manufacturer or a distributor must obtain certification from an authorised, and normally public sector associated, third party (i.e., a 'Technical service') for each component and separate technical unit. With this option, industry would benefit from a **potential net cost saving of 18 % of their compliance costs.**[62] Considering the baseline compliance costs of €3 561 million, this option would bring a net average cost saving of **€641 million over ten years**.

Since SMEs account for 18% of the market revenues, it can be therefore estimated that the **net benefits for SMEs** are 18% of the total amount, i.e., **€115 million over ten years.**

The manufacturers were of the view that this option requires a lot of effort, remains quite costly, and because of this, is the least beneficial[63]. This is also in line with the findings of the impact assessment study.

As a further illustration, the manufacturers' feedback stressed the extent of the administrative costs and burdens involved in undertaking a 'traditional' type-approval procedure[64]. One large manufacturer in Sweden explained that whereas tractors generally are similar, there are thousands of different specialised mobile machines that are engineered to perform specific functions[65]. Therefore, among other things, under a 'traditional' type-approval procedure, the testing of each component and separate

[61] The policy options were defined in a different way in the 2019 study. To correctly interpret the results of the study, the equivalence is stated at the beginning of each section in this chapter.

[62] "Cost/benefit analysis study for Impact Assessment on road circulation of Non-road mobile machinery". Page 20. The manufacturers and distributors interviewed for the costs and benefits study based this judgement on their experience in implementing Regulation 167/2013 on the approval of agricultural and forestry vehicles, which, even if different, remains the most comparable return of experience.

[63] Public consultation outcomes available at: https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/1198-Road-circulation-requirements-for-mobile-machinery/public-consultation_en.

[64] "Cost/benefit analysis study for Impact Assessment on road circulation of Non-road mobile machinery". Page 19.

[65] Still, tractors and regulation 167/2013 are the closest comparison to non-road mobile machinery, although the necessary differences must be considered.

technical unit would be unnecessarily complex and would also result in a major administrative burden for industry given the associated documentation requirements.

6.1.1.2 Impact on rental companies and end users

As indicated in the baseline option, when this has not been dealt with by manufacturers or distributors, EU **rental companies and end users presently incur costs of approximately €2 442 million over ten years** to comply with the current safety requirements and to obtain the necessary certification and approvals for the road circulation of non-road mobile machinery. This amount includes both the direct and indirect costs.

The main direct costs experienced by **end users** relate to the need to adapt non-road mobile machinery to meet national road safety requirements, if this has not been dealt with by manufacturers or distributors. The main indirect costs for end users stem from lost earnings due to the delay and/or unpredictable delivery of machines.

The main direct costs for **rental companies** stem from familiarisation with the legislation for the road approval of non-road mobile machinery, technical and administrative procedures that include fixing national vehicle compliance or warning signs to meet national road safety requirements, adapting machinery (e.g. change of type of tyres) or sending it back to manufacturers. The main indirect costs experienced by rental companies come from time delays due to having to follow the national road safety requirements for the machinery produced in other Member States.

The costs and benefits study suggested that the **costs of compliance could be reduced by roughly one fifth**[66]**.** The costs and benefit study did not gather any information about the impacts the different options would have on end users and rental companies (intermediaries) as these stakeholder groups are at the end of the non-road mobile machinery supply chain and are not likely to differentiate between the various ways to harmonise the non-road mobile machinery requirements.

However, it can be reasonably assumed that a more burdensome legislation implies more and costlier adaptations of machinery. Thus, option 1a would be the costlier for end users and rental companies, similarly to what happens for manufacturers. Therefore, it can be inferred that, by introducing a full type-approval system in this area, a **cost saving of €439 million (18%)** could be achieved by rental companies and end users **over ten years**.

A positive aspect for rental companies and end users is that they will be able to use non-road mobile machinery in borderline areas easily, without any burden due to different requirements in neighbour EU countries. They will also have access to a wider choice and more innovative types of non-road mobile machinery, independently of the country they are based in. However, these effects come from the harmonisation, and are independently of the policy option chosen.

On the other side, although the overall economic impact is clearly positive for users, being this option the costlier for manufacturers, it may lead to relatively higher prices for users, if compared to options 1b and 2. In that sense, users' associations shared the views

[66] "Cost/benefit analysis study for Impact Assessment on road circulation of Non-road mobile machinery". Page 28.

of the manufacturers, in that option 1a requires more effort and remains quite costly; hence, it is in their view not the preferred way forward.

6.1.1.3 Impact on Member States authorities

In total, all **EU Member State authorities currently spend around €23 million over ten years on the enforcement of existing rules** for the requirements of the road approval of non-road mobile machinery[67]. The enforcement activities usually include tasks such as granting the approval for non-road mobile machinery, market surveillance, vehicle conformity spot checks, and the removal and storage of non-conforming vehicles.

The costs of harmonisation strongly depend on the current domestic conformity assessment system. The results of a targeted consultation[68] suggest that some of the Member States (e.g., Denmark and Bulgaria) do not yet have an established system either for Approval or Market Surveillance for the road approval of non-road mobile machinery. Any harmonisation attempt would increase costs to such authorities, because they will have to establish the system. Such authorities are unable to speculate on the expected costs, because they have no system to compare the policy with.

On the other hand, there are Member States that have well-established systems for road approval of non-road mobile machinery and can provide reasonable input to the assessment of the potential costs of different policy options (e.g., Germany). Their data show that they do not expect any cost savings from the potential harmonisation of non-road mobile machinery legislation at EU level. On the contrary, data show that switching from an old system to a new one and complying with a harmonised EU Regulation carries some cost implications.

Member States that have a stringent system in place do not expect substantial one-off compliance costs (e.g., Germany, France), while those that have not very demanding systems do. In addition, the authorities do not expect substantial costs for implementing the new rules. Hence, harmonisation costs are mostly driven by enforcement costs[69].

Member States that have an intermediate system can have different cost impact depending on the option. For example, MS authorities in Spain would spend €342 000 more under the option 1a (compared against the baseline) over ten years[70].

Member states authorities believe that for road circulation and road safety, it is preferable a type-approval procedure, like for all other vehicle categories. However, many of them recognise that non-road mobile machinery is a peculiar case. They drive on the road only occasionally, they are subject to national traffic rules specific to such machinery to ensure the safety of the road, they have many design specificities (due to the work they are designed to perform) and producers are often small manufacturers (SMEs). Thus, in

[67] "Cost/benefit analysis study for Impact Assessment on road circulation of Non-road mobile machinery". Page 31.

[68] Working document 'NRMM-2019.03 MS Targeted Consultation Feedback' summarising the findings of the targeted consultation carried out by the Commission on differences between member states approval systems for the road circulation of non-road mobile machinery. Available in the library section of the CIRCABC interest group "New legislative initiative - Road circulation approval requirements for non-road mobile machinery".

[69] Enforcement costs are defined as enforcement of the existing rules for the requirements for the road circulation of non-road mobile machinery. For example, such costs can include the following tasks: granting the approval of the machinery; customs/market surveillance; vehicle conformity spot checks; removal and storage of non-conforming vehicles.

[70] "Cost/benefit analysis study for Impact Assessment on road circulation of Non-road mobile machinery". Page 32.

their view, it would be important to reduce the associated administrative procedures as much as possible, and a full type-approval option would seem not proportionate.[71]

6.1.1.4 Impact on technical services

Option 1a, where third party testing and involvement is required for the whole machine, is expected to increase the revenue for almost half of the technical service respondents, while the other respondents did not expect a significant change. This is likely to be an overestimate, as some participants did not consider the effect of harmonisation itself, which will lead to less testing overall.

Technical services are the only stakeholder group in favour of option 1a. Despite this, they recognise that elements of simplification of this type-approval process as proposed in option 1b are practical and appropriate for the market.[72]

In general, technical services stakeholders would prefer policy options that provide the certification of each system component and technical unit to those policy options that allow self-testing. Despite this, they recognised that it would be expensive and complicated to test the whole machine. This is because there are many different types of machines requiring different methods of testing. Several of the third party testing respondents to consultations stated that they performed tests on non-road mobile machinery very rarely. They argued that their scope of testing is not large enough. One interviewee even stated that the type-approval option is the 'hardest' option and 'impossible' to implement because of the costs associated with investing in the testing of the entire machine. [73]

6.1.1.5 Impact on competitiveness

This option will have an overall net positive effect on profitability and innovation, hence on competitiveness, in comparison with the baseline, thanks to the net savings that manufacturers will benefit from avoiding multiple approvals, market entry barriers and delays.

However, when compared to the other options, this option is the costlier, and might lead to relatively higher prices for users, and thus competitiveness could be enhanced to a lesser extent than with options 1b and 2.

6.1.1.6 Impact on single market

Harmonisation of road approvals, independently of the policy option chosen, will have a positive effect in the proper functioning of the single market thanks to a harmonised approval system, accepted in all EU countries. It will also stimulate cross border sale and use of non-road mobile machinery, and a wider choice of more innovative machinery.

[71] Working document 'NRMM-2021.02 Public Consultation outcomes rev. 1' summarising the views of all stakeholders on the several policy options. Available in the library section of the CIRCABC interest group "New legislative initiative - Road circulation approval requirements for non-road mobile machinery".

[72] Position paper 'NRMM-2021.12 VdTÜV-DGGrowC3_feedback NRRM_010621' from the Association of Technical Inspection Agencies. Available in the library section of the CIRCABC interest group "New legislative initiative - Road circulation approval requirements for non-road mobile machinery".

[73] "Cost/benefit analysis study for Impact Assessment on road circulation of Non-road mobile machinery". Page 35.

6.1.2 Social impacts

6.1.2.1 Road Safety

One of the topics addressed through the consultations regards the degree of safety of non-road mobile machinery and the incidence of accidents, depending on the regulatory approach.

There is a lack of good data on the number of road accidents involving non-road mobile machinery, due to their infrequency and to the fact that in some member states non-road mobile machinery data are not isolated (e.g. are merged with tractors data). Furthermore, non-road mobile machinery is not meant to go often on the road, and in several countries, for example, Bulgaria[74], it is completely forbidden to drive some types of non-road mobile machinery on public roads.

In some cases where there are recorded accidents, these appeared to have occurred due to a lack of machine maintenance or the recklessness of users in driving the machinery. However, in some other cases, as reported in section 2.1, problem 5, it has been established that the width of the construction vehicle, in combination with narrow roads, is a major cause of accidents, as well as the fact that the driver's view is often blocked by parts of the vehicle, tools or charge. In addition, the visibility and recognizability of non-road mobile machinery in the dark can be a problem.

The lack of available data mattered for the stakeholders' opinion on whether harmonisation would decrease the incidence of accidents. Because of the lack of available data and personal experiences with accidents, none of the manufacturers and distributors interviewed were certain about the positive impact of harmonisation on road accidents. Despite this, from a normative point of view, most of the technical services and almost half of the Member State authorities believed that having a harmonised system could raise standards and decrease NRMM road accidents in Europe[75].

Option 1a includes not only the safety requirements, but also the technical specifications to comply with the safety requirements are integrated in the legislation; therefore, it ensures high and equal requirements and technical solutions across the EU. Hence, option 1a presents the maximum benefit in terms of road safety.

6.1.3 Environmental impacts

As explained in section 1.2 of this report dealing with the political and legal context, Regulation (EU) 2016/1628 lays down the requirements relating to gaseous and particulate pollutant emission limits and type-approval for internal combustion engines for non-road mobile machinery. Thus, regulating pollutant emissions is not in scope of this initiative.

As regards **noise emissions**, section 1.2 of this report mentions the existence of Directive 2000/14/EC relating to the noise emission in the environment by equipment for use outdoors. However, this directive does not deal with all non-road mobile machinery, only with part of it[76]. In addition, Directive 2000/14/EC sets up 'sound power level' limit

[74] "Cost/benefit analysis study for Impact Assessment on road circulation of Non-road mobile machinery". Page 37.
[75] "Cost/benefit analysis study for Impact Assessment on road circulation of Non-road mobile machinery". Page 39.
[76] As an example, Directive 2000/14/EC includes 'dozers (<500 kW)', but the biggest dozer models go beyond 500 kW.

values, which are measured immediately close to the machine, and not 'sound pressure levels', which are measured at a certain distance, as in Regulation (EU) 167/2013. Limits to 'sound pressure levels' are more relevant for road circulation.

All policy options considered in this impact assessment will include a requirement on noise emission limits. In principle, such requirement will be implemented in a different way depending on the policy option selected. Option 1a would impose that compliance with road circulation noise emission limits is third party tested. However, because the noise limits will be the same in all policy options, all options have the same positive impact as regards noise emissions.

No other environmental impacts are expected.

6.2. Policy Option 1.b – Simplified type-approval

The policy options in the costs and benefit study were not the same as in this report. Option 1b in this report corresponds to 'option 1b sub option c' in the costs and benefit study carried out in 2019[77].

6.2.1 Economic impacts

6.2.1.1 Impact on manufacturers and distributors (large enterprises and SMEs)

Option 1b is an intermediate option in terms of cost. According to this option, a manufacturer or a distributor must obtain certification from an authorised, and normally public sector associated, third party (i.e., a 'Technical service') for critical components and separate technical units associated to use of the non-road mobile machinery on public roads, but they can rely on self-certification or self-testing for items deemed less critical.

With this option, manufacturers and distributors would **save on average 21% of their compliance costs (20% for large enterprises and 38% for SMEs).** Considering the baseline compliance costs of €3 561 million**,** this option would bring a net average cost saving of **€748 million over ten years**.

Since SMEs account for 18% of the market revenues, it can be therefore estimated that the **net benefits for SMES** are 18% of the total amount, i.e., **€134 million over ten years.**

During consultation with stakeholders[78], the **manufacturers'** associations[79] expressed unanimously the view that **option 1b is preferred** in terms of legal procedures for compliance.

[77] The policy options were defined in a different way in the 2019 study. To correctly interpret the results of the study, the equivalence is stated at the beginning of each section in this chapter.

[78] Working document 'NRMM-2021.02 Public Consultation outcomes rev. 1' summarising the views of all stakeholders on the several policy options. Available in the library section of the CIRCABC interest group "New legislative initiative - Road circulation approval requirements for non-road mobile machinery".

[79] CEMA (Agricultural equipment), CECE (Construction equipment), FEM (Material handling equipment), EUnited (Municipal equipment), EGMF (Garden machinery), and others (Axema, Ansemat, VDMA, Evolis).

6.2.1.2 Impact on rental companies and end users

As explained in policy option 1a, the costs and benefits study suggested that the **costs of** compliance could be reduced by roughly one fifth[80], but did not gather any information about the impacts the different options would have on rental companies and end users.

However, it can be reasonably assumed that, as regards direct costs, a less burdensome legislation implies less frequent and less costly adaptations of machinery if compared to option 1a. Option 1b would be the intermediate for rental companies and end users, similarly to what happens for manufacturers and distributors. Therefore, it can be inferred that, by introducing a simplified type-approval system in this area, a **cost saving of €512 million (21%)** could be achieved by rental companies and end users **over ten years**.

As option 1a, option 1b will allow rental companies and end users to use non-road mobile machinery in borderline areas easily, without any burden due to different requirements is neighbour EU countries. They will also have access to a wider choice and more innovative types of non-road mobile machinery, independently of the country they are based on.

On the other side, although the net economic impact of option 1b is clearly positive for end users, option 1b is the intermediate in terms of cost for manufacturers. Therefore, if manufacturers decide to pass on to customers part of their compliance costs, option 1b might lead to relative lower prices for users than option 1a, and to relative higher prices for users than option 2.

The two main user associations in the sector[81] shared the manufacturers' opinion that option 1b was preferable as it was the most proportionate, striking a reasonable balance between more stringent conformity procedures for critical vehicle features and less stringent procedures for non-critical vehicle features.

6.2.1.3 Impact on Member States authorities

As explained in policy option 1a, an EU harmonisation would result in limited cost impacts for Member State authorities[82]. However, the less complex the option, the less cost for the implementation by the authorities, hence, impacts of option 1b for road approval authorities are lower than for option 1a but higher than for option 2.

During consultation with stakeholders, all **member states** authorities responding (9 in total)[83] expressed **preference for option 1b** in terms of legal procedures for compliance and proportionality.

6.2.1.4 Impact on technical services

Option 1b could increase the revenue of technical services, but less than option 1a.

---

[80] "Cost/benefit analysis study for Impact Assessment on road circulation of Non-road mobile machinery". Page 28.
[81] CEETTAR (European Organisation of Agricultural, Rural and Forestry Contractors) and Copa-Cogeca (Farmer and Agri-Cooperatives associations).
[82] "Cost/benefit analysis study for Impact Assessment on road circulation of Non-road mobile machinery". Page 31.
[83] Public consultation outcomes available at: https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/1198-Road-circulation-requirements-for-mobile-machinery/public-consultation_en.

6.2.1.5 Impact on competitiveness

As option 1a, this option will have an overall net effect on profitability and innovation, hence on competitiveness, in comparison with the baseline, thanks to the net savings that manufacturers will benefit from avoiding multiple approvals, market entry barriers and delays.

If manufacturers decide to pass on to customers part of the compliance costs, this option might lead to relatively lower prices for users than option 1a, and relatively higher prices for users that option 2, and thus competitiveness could be enhanced to a higher extent than with option 1a and to a lesser extent than with option 2.

6.2.1.6 Impact on single market

Same as in policy option 1a.

6.2.2 Social impacts

6.2.2.1 Road Safety

As explained in policy option 1a, almost half of the Member State authorities believed that having a harmonised system could raise standards and decrease NRMM road accidents in Europe[84].

The requirements in options 1a and 1b are similar, being the main difference between both the need for involving a third party (for all items in option 1a and only for critical items in option 1b). Third party testing procedures are used in the current type-approval legislation, and this option would include them only for the critical items, for the sake of proportionality. Since option 1a has more stringent conformity procedures for more component than option 1b, option 1b presents less benefits for the road safety of option than option 1a.

6.2.3 Environmental impacts

As explained in policy option 1a, all policy options considered in this impact assessment will include a requirement on noise emission limits. Option 1b would impose that compliance with road circulation noise emission limits is third party tested, for it is considered critical. However, because the noise limits will be the same in all policy options, all options have the same positive impact as regards noise emissions.

Similarly to policy option 1a, no other environmental impacts are expected.

6.3. Policy Option 2 – CE Marking (New approach type of legislation)

The policy options in the costs and benefit study were not exactly the same as in this report. Option 2 in this report corresponds to ‘option 2 sub option b’ in the costs and benefit study carried out in 2019[85].

[84] “Cost/benefit analysis study for Impact Assessment on road circulation of Non-road mobile machinery”. Page 39.
[85] The policy options were defined in a different way in the 2019 study. In order to correctly interpret the results of the study, the equivalence is stated at the beginning of each section in this chapter.

6.3.1 Economic impacts

6.3.1.1 Impact on manufacturers and distributors (large enterprises and SMEs)

Option 2 is the less costly option, as the manufacturers would carry out a self-declaration and affix the CE marking on the machinery to indicate that the machinery conforms to the provisions of the legislation, without obligation to involve a third party. Industry would **save on average 22 % of their compliance costs (21% for large enterprises and 39% for SMEs).** Considering the baseline compliance costs of € 3 561 million, to comply**,** this option would bring a net average cost saving of **€783 million over ten years**.

Since SMEs account for 18% of the market revenues, it can be therefore estimated that the **net benefits for SMES** are 18% of the total amount, i.e., **€ 140 million over ten years.**

Despite being the less costly option for manufacturers, the main manufacturers' associations[86], expressed the view that this would not be their preferred option. Manufacturers are often producing not only mobile machinery, but also other vehicles, such as tractors, and they are used to the type-approval legislation. They know how it works, what they can expect, and they can make internal synergies. The main industry associations answered the public consultation in favour of option 1b. In addition, according to the manufacturers' feedback during the costs and benefit study, it appeared that third party testing procedures, as requested in options 1a and 1b, improved companies reputation, in the eyes of customers, who see third party 'sign-off' as a guarantee of safety, and that the absence of such a review may affect their future sales. Thus, if manufacturers were given the flexibility to independently manage the conformity assessment process, many would anyhow likely use third party testing services to reduce any end-user concerns regarding product safety[87]. Interviews with industry players confirmed the impression that consumers and authorities accept non-road mobile machinery more easily if a third party has been part of the process. Several manufacturers did not prefer the self-testing option for critical features, such as braking and steering, under the CE marking procedures, stating that it would result in reputational costs.

When it comes to the description of technical requirements, the associations' view was that working with basic requirements in the legal text and detailed requirements in harmonised standards would be less suitable. The legislation should already include all technical requirements, either directly or by referencing recognised standards. Since the legislation is going to be new, there would be no harmonised standards related to this legislation at the time the latter is published. The creation of such harmonised standards is likely to be a lengthy process, which would significantly delay the clear benefits provided by the legislation. Further, the voluntary nature of harmonised standards might not be suitable for road safety legislation.[88]

[86] CEMA (Agricultural equipment), CECE (Construction equipment), FEM (Material handling equipment), EUnited (Municipal equipment), EGMF (Garden machinery), and others (Axema, Ansemat, VDMA, Evolis).
[87] "Cost/benefit analysis study for Impact Assessment on road circulation of Non-road mobile machinery". Page 16.
[88] Public consultation outcomes available at: https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/1198-Road-circulation-requirements-for-mobile-machinery/public-consultation_en.

6.3.1.2 Impact on rental companies and end users

As explained in policy option 1a, the costs and benefit study did not gather any information about the impacts the different options would have on rental companies (intermediaries) and end users as these stakeholder groups are at the end of the non-road mobile machinery supply chain and are not likely to differentiate between the various ways to harmonise the non-road mobile machinery requirements.

However, it can be reasonable assumed that, as regards direct costs, a less burdensome legislation is faster to apply and lead to less market delays. As far as direct costs are concerned, in option 2 the legislation sets only the essential requirements, thus there is more flexibility in the manufacturer's design, which then leads to less need for modifications of the machinery by the end user to comply with the road approvals. Thus, option 2 would be less costly for rental companies and end users than options 1a and 1b, similarly to what happens for manufacturers. Therefore, it can be inferred that, by introducing a simplified type-approval system in this area, a **cost saving of €537 million (22%)** could be achieved by rental companies and end users **over ten years**.

Option 2 will allow rental companies and end users to use non-road mobile machinery in borderline areas easily, without any burden due to different requirements is neighbour EU countries. They will also have access to a wider choice and more innovative types of non-road mobile machinery, independently of the country they are based on.

On the cost side, the economic impact of option 2 is clearly the most positive for end users if compared to options 1a and 1b. This option not only avoids multiple approvals but diminishes the compliance costs compared to the baseline in those member states which currently have type-approval-like legislation for non-road mobile machinery. Such lower compliance costs, if passed on to end users, could mean lower prices in the market less compliance costs.

Despite this, the main user associations in the sector[89] shared the manufacturers' opinion that option 2 was not preferable. Instead, a type approval system should be used, as for all other vehicles.

6.3.1.3 Impact on Member States authorities

As explained in policy option 1a, an EU harmonisation would not result in average cost savings for Member State authorities[90]. However, the less complex the option, the less cost for the implementation by the authorities, hence, impacts of option 2 for road approval authorities are lower than for options 1a and 1b.

Member States that have stringent or intermediate approval systems could have a cost saving if switching to a simpler system. For instance, under the CE marking option 2 the Spanish authorities would potentially save around €1.8 million over ten years[91].

During consultations with stakeholders, none of the **Member States** authorities responding[92] **preferred** option 2. They considered it as non-adequate for road safety and

[89] CEETTAR (European Organisation of Agricultural, Rural and Forestry Contractors) and Copa-Cogeca (Farmer and Agri-Cooperatives associations).
[90] "Cost/benefit analysis study for Impact Assessment on road circulation of Non-road mobile machinery". Page 31.
[91] "Cost/benefit analysis study for Impact Assessment on road circulation of Non-road mobile machinery". Page 32.
[92] Public consultation outcomes available at: https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/1198-Road-circulation-requirements-for-mobile-machinery/public-consultation_en.

wanted to keep control of the approval of the whole machine. The also feared that in case approval of the whole machine would be left to manufacturers, more ex-post control and enforcement would be needed, hence what appears as the least costly procedure could in the end become the most expensive.

6.3.1.4 Impact on technical services

Option 2 would clearly reduce the revenue of technical services, although this could be mitigated by the fact that manufacturers would likely continue to use them. Technical services respondents highlighted that the loss would be greater for smaller technical services and those that are specialised in non-road mobile machinery and deal more or solely with this type of vehicles. However, it is very rare that a technical service only tests non-road mobile machinery[93].

6.3.1.5 Impact on competitiveness

As options 1a and 1b, this option will have an overall net effect on profitability and innovation, hence on competitiveness, in comparison with the baseline, thanks to the net savings that manufacturers will benefit from avoiding multiple approvals, market entry barriers and delays.

As explained in section 6.3.1.2, this option may lead to end user prices relatively lower that option 1a and 1b, and thus competitiveness could be enhanced to a higher extent. However, the lack of third party certification could be a disadvantage as it may be seen as a lower certification for safety, and this may offset by far the potential advantage linked to lower prices.

6.3.1.6 Impact on single market

Same as in policy option 1a.

6.3.2 Social impacts

6.3.2.1 Road Safety

In option 2 the legislation would include only the essential safety requirements, but the detailed technical specifications would be either described in harmonised standards, which are voluntary, or alternative solutions could be proposed by manufacturers, who then should proof an equal level of safety. Therefore, option 2 could ensure high requirements and technical solutions; however, ‘equal’ requirements and technical solutions would not be granted by option 2. Indeed, option 2 allows manufacturers to either follow the harmonised standards or propose other solutions, thus allows different technical solutions depending on the manufacturer. Such different technical solutions would be less coherent with the type-approval frameworks for other vehicles, and more complex to handle for rental companies and end users when in charge of individual approvals. In EU countries with looser legislation option 2 might be an improvement, but in EU countries with stricter legislation, option 2 might not be an improvement if compared to the baseline. Therefore option 2 is not as good as 1a and 1b in terms of road safety.

[93] “Cost/benefit analysis study for Impact Assessment on road circulation of Non-road mobile machinery”. Page 35.

6.3.3 Environmental impacts

As explained in policy options 1a and 1b, all policy options considered in this impact assessment will include a requirement on noise emission limits. Option 2 would allow that the manufacturer self-certifies the compliance with such limits. However, because the noise limits will be the same in all policy options, all options have the same positive impact as regards noise emissions.

Similarly to policy options 1a and 1b, no other environmental impacts are expected.

6.4. Directive or regulation

The new policy intends to set out the technical requirements to be complied with when granting EU type-approval, so it must be highly detailed and leave practically no room for discretion for Member States when transposing them.

If a directive were chosen, some Member States would simply make direct reference to this directive, while others would develop a completely new legislative text meant to correctly transpose those requirements. This has led in the past in other areas to difficulties for manufacturers, as national transpositions may slightly differ for example concerning dates of publication and entry into force and even different interpretations between type-approval authorities with regard to the substantive requirements. This is particularly problematic in this case where the requirements are highly technical, very detailed, and likely to regularly amended due to adaptations to technical progress. Transpositions would use resources in national administrations without adding any value in terms of safety or environmental protection.

The impacts estimated for policy options 1a, 1b and 2 are similar in the case of a directive or a regulation, since the technical requirements are fully harmonised and no real deviation will be allowed in the case of a directive. The main difference in terms of impacts would be the additional transposition costs for Member States in case of a directive. However, these costs are limited if compared with the estimated costs and benefits of the options.

6.5. Mandatory versus optional

The new framework may be mandatory or optional.

Mandatory means that all Member States would introduce the new harmonised system, which will replace their current rules for homologation of non-road mobile machinery. Manufacturers will need to do the road approval for a new model only once, and in one EU country, to sell it EU wide. This is the case today with the type-approval regulations for M, N, O, T1, T2, T3 and C categories. [94]

[94] M: vehicles carrying passengers; N: vehicles carrying goods; O: Trailers; L: 2- and 3-wheel vehicles and quadricycles; C: tracked agricultural and forestry tractors; T: wheeled agricultural and forestry tractors, among which:

- T1wheeled tractors, with the closest axle to the driver having a minimum track width of not less than 1 150 mm, with an unladen mass, in running order, of more than 600 kg, and with a ground clearance of not more than 1 000 mm;
- T2: wheeled tractors with a minimum track width of less than 1 150 mm, with an unladen mass, in running order, of more than 600 kg, with a ground clearance of not more than 600 mm; if the height of the centre of gravity of the tractor (measured in relation to the ground) divided by the average minimum track for each axle exceeds 0,90, the maximum design speed shall be restricted to 30 km/h;

Optional means that all Member States would introduce the new harmonised system, but could keep their current rules for homologation of non-road mobile machinery; hence, they would manage a double system. Manufacturers can choose whether to do the road approval for a new model only once, in one EU country, and sell it EU wide, or continue using the national approvals in the countries where they sell their machines. This is the case today with the type-approval regulations for T4, R and S categories. [95]

Mandatory: replaces the current 27 national rules

Technical Services were the only stakeholder favouring a mandatory policy, invoking the commitment towards an ever-closer union among the Member States.[96]

No other consulted stakeholders were in favour of a mandatory policy[97]. Non-exporting **manufacturers** would bear higher costs to adapt and comply with the new framework, particularly if they sell in markets with current less stringent road approval legislation for non-road mobile machinery. **User associations**[98] were of a similar opinion. **Member States** participating to the consultations considered it best to have an optional policy instead, and switch to a mandatory policy later, once there is some experience accumulated. They mentioned the fact that in the long term, some national authorities will align their national approvals to the new EU legal framework anyway (as it happened with tractors) and a later switch to a mandatory legislation would likely happen smoothly.

Optional: an alternative to the current 27 national rules

As explained above, **all consulted stakeholders prefer an optional framework, with the exception of the technical services[99].**

Manufacturers saw the advantage of flexibility: large companies or SMEs that export to several EU countries would benefit from the new policy, while companies that are not export oriented could choose to keep complying with the current national approvals in the few countries where they sell their machines. **User associations**[100] were of a similar opinion.

Member States participating to the consultations[101] considered it best to have an optional policy in a first step, although most of them would see a conversion into a mandatory framework later. EU authorities are used to handle both EU harmonised policy and

- T3: wheeled tractors with an unladen mass, in running order, of not more than 600 kg.

[95] T4: special purpose wheeled tractors; R: agricultural trailers; S: agricultural interchangeable towed equipment.

[96] Position paper 'NRMM-2021.12 VdTÜV-DGGrowC3_feedback NRRM_010621' from the Association of Technical Inspection Agencies. Available in the library section of the CIRCABC interest group "New legislative initiative - Road circulation approval requirements for non-road mobile machinery".

[97] Working document 'NRMM-2021.02 Public Consultation outcomes rev. 1' summarising the views of all stakeholders on the several policy options. Available in the library section of the CIRCABC interest group "New legislative initiative - Road circulation approval requirements for non-road mobile machinery".

[98] CEETTAR (European Organisation of Agricultural, Rural and Forestry Contractors) and Copa-Cogeca (Farmer and Agri-Cooperatives associations).

[99] Working document 'NRMM-2021.02 Public Consultation outcomes rev. 1' summarising the views of all stakeholders on the several policy options. Available in the library section of the CIRCABC interest group "New legislative initiative - Road circulation approval requirements for non-road mobile machinery".

[100] CEETTAR (European Organisation of Agricultural, Rural and Forestry Contractors) and Copa-Cogeca (Farmer and Agri-Cooperatives associations).

[101] Public consultation outcomes available at: https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/1198-Road-circulation-requirements-for-mobile-machinery/public-consultation_en.

national approvals in parallel. This is already the case with categories R and S under Regulation 167/2013.

In the case of an optional policy, the impacts estimated for options 1a, 1b and 2 will depend on the level of adherence of manufacturers to the new EU legal framework. Considering that, as described in section 1.3, only 4% of the non-road mobile machinery produced in the EU is sold in the EU country where production takes place, in many instances it will be interesting for manufacturers to apply for an EU road approval[102]. The 4% is estimated to correspond to cases where manufacturers either market their machinery only in one country, or are produced in small series.

As regards Member States authorities, they will have to bear the additional costs of setting up the new EU road approval system, while at the same time keeping the national system[103]. However, these additional costs are limited[104].

In any case, the benefits of a voluntary EU system are likely to be much higher than the costs of maintaining parallel systems. The costs and benefits study done in 2019 showed that the authorities spend around €23 million over ten years on the enforcement of road circulation rules, a much lower order of magnitude than the costs that economic operators currently incur (€3 561 million over ten years for manufacturers and distributors, and €2 442 million over ten years for rental companies and end users). New EU rules would bring around savings amounting to one fifth of the costs for manufacturers and distributors as well as rental companies and end users. In the case of a voluntary framework, it can be assumed that all large enterprises (accounting for 66% of the sector's revenues) would apply for the EU regulation for their new machinery. In addition, export-oriented SMEs for which the EU rules will be advantageous will likely apply for it too, so a majority of the estimated savings will still be realised. Each manufacturer will make its own business case. The voluntary framework will be available to be used if more convenient to them; and it will be more convenient from the moment a company sells their machinery in several countries.

Out of 19 authorities responding to the targeted consultation, only 3 estimated a significant additional cost (> 20%) to enforce new EU rules, corresponding to countries where road circulation rules are very loose or non-existing today, while the other 16 countries declared that some effort (< 20%) or limited effort (<5%) would be required as compared to today. This means that the costs are higher to set up a system for those who do not have it, than to run two parallel systems. In addition, there are many synergies with other road approvals for other vehicle types, such as the network of technical services already in place for other vehicles. Hence, the fact of adding a new system while keeping the old one is not seen as an issue by road authorities. Member States are also quite used to such parallel systems, which worked well for categories R and S under the tractors regulation 167/2013.

[102] In addition to this 4%, some other cases where machinery is sold only in few EU countries may stay under the national systems.

[103] A comparison between the estimate of costs of keeping the national rules with the benefits for 4% of production of the non-road mobile machinery produced in an EU country and sold in that EU country could not be established. However, it must be considered that the existing national rules are already implemented, and the costs for keeping them are minimal. The biggest cost for authorities would be the cost of having a new system in place.

[104] It must be noted that, even if the new framework is optional, Member States may decide to align they current rules to the new EU framework. In such case, manufacturers will not have a real choice in that country, other than applying the harmonised framework. This may set the ground to convert the optional legislation in a mandatory one in a future revision.

6.6. Include (or not) towed equipment

Cover both self-propelled and towed machinery.

The legislation would cover all self-propelled and towed machinery. As a result, the new policy would become more complex, since requirements for towed machinery are different from those for self-propelled machinery.

Construction equipment, material handling and municipal equipment manufacturers were in favour of the full scope, since they produce a towed equipment types that they considered could be covered by the new policy. User associations and technical services were neutral, and so were the agricultural and garden machinery manufacturers. Most Member States were not in favour.

Cover only self-propelled non-road mobile machinery.

The legislation would cover only self-propelled machinery, giving the fact that there is a number of type-approval legislation covering already towed vehicles, such as the categories O (trailers), R (agricultural trailers) and S (agricultural interchangeable towed equipment).

The total annual production non-road mobile machinery in 2019 amounted to 12.5 billion, of which the **self-propelled machinery** accounted to **€10 billion (80%** of the total non-road mobile machinery production value), whereas the **towed equipment** accounted for **€2.5 billion (20%** of the total production value**)**. However, most of the towed machinery market is for agricultural applications, and therefore covered by the existing type-approval under Regulation 167/2013 (categories 'R' and 'S' as indicated in section 1.2). Other towed equipment falls under existing type-approval stem for category 'O' under Regulation 2018/858. The few towed equipment types that would remain uncovered would be a small part of the market, sold in low volumes, and in a first step properly addressed by the current national approval systems. Thanks to this limit to the scope, misuse of the new policy for categories already covered under existing legislation would be prevented, while the objective to legislate for most cases would still be fulfilled.

Most Member States participating to the consultations preferred not to include any towed equipment. Many of the towed machinery types are towed by trucks at truck speed, therefore the existing framework category O trailers, with potential future adaptations, seemed more adequate.

If the scope would exclude the towed equipment not currently included in categories R, S and O, which are estimated to be less than 10%[105] of the market of the non-road mobile machinery, the projected savings will also be reduced by less than 10%. This has been considered in the comparison of options and in Annex 3.

6.7. Limit (or not) the scope to a maximum design speed up to 40 Km/h

Cover all non-road mobile machinery, independently of the maximum design speed.

In this case, the legislation would cover all speed self-propelled machinery, **independently of the maximum design speed**. In this option, requirements that are

[105] The share of towed machinery is calculated based on Eurostat statistics and related PRODCOM codes.

more stringent will be set up for machinery with maximum design speeds over 40 km/h, which is around 10% of the total self-propelled mobile production value.

Manufacturers were in favour of the full speed range, which would allow having a framework covering all non-road mobile machinery and according to them, would really fill the gap in the internal market[106].

Some **Member States** were against the full speed range because they saw a risk of 'cherry picking', i.e., manufactures misusing the new framework for their fast vehicles that should find their place in the existing type-approval system[107]. This risk would be higher in some identified borderline areas (e.g., mobile cranes[108]), and a maximum design speed limit was considered very effective in preventing such cases.

Cover only non-road mobile machinery with a maximum design speed up to 40 Km/h.

The legislation would cover only 'slow' self-propelled machinery, which is the majority of the non-road mobile machinery market, and the kind of machinery that deserves a dedicated harmonised approval system. In this way, it would be prevented that fast vehicles find their way out of the full type-approval legislation (Regulations 2018/858, 167/2013 and 168/2013 on motor vehicle categories M, N, O, L, T, C) and into simplified approval system, thus putting at risk the existing level of road safety.

Among the **€12.5 billion** annual production of self-propelled machinery, **90%** corresponded to machinery designed to reach a maximum road speed of **40 Km/h or less** while **10%** related to machinery designed for a road speed **higher than 40 Km/h** (**10%** of the total) [109].

It must also be considered that some Member States limit the circulation speed of non-road mobile machinery to 40 km/h, since they consider that such vehicles should not be allowed to run faster. A maximum design speed limit in the new framework would hence discourage manufacturers to produce equipment with maximum design speeds over 40 km/h.

Most Member States participating in consultation favoured this limitation of the scope and considered that any fast non-road mobile machinery should find a place in the current type-approval legislation. Road safety risks are proportional to the road speed, thus a simplified framework for fast non-road mobile machinery seemed to be not coherent. User associations were also in favour of a maximum design speed limit in the scope, while technical services were neutral[110].

---

[106] Working document 'NRMM-2021.03 Feedback from last workshop' summarising the views of all stakeholders. Available in the library section of the CIRCABC interest group "New legislative initiative - Road circulation approval requirements for non-road mobile machinery".

[107] Working document 'NRMM-2021.03 Feedback from last workshop' summarising the views of all stakeholders. Available in the library section of the CIRCABC interest group "New legislative initiative - Road circulation approval requirements for non-road mobile machinery".

[108] 'A vehicle of category N3, not fitted for the carriage of goods, provided with a crane whose lifting moment is equal to or higher than 400 kNm', is considered as a 'special purpose vehicle' in the sense of Regulation 2018/858. This regulation deals with the approval and market surveillance of motor vehicles and their trailers, and of systems, components and separate technical units intended for such vehicles.

[109] The share of 'slow' self-propelled machinery is calculated based on estimates provided by the industry.

[110] Working document 'NRMM-2021.03 Feedback from last workshop' summarising the views of all stakeholders. Available in the library section of the CIRCABC interest group "New legislative initiative - Road circulation approval requirements for non-road mobile machinery".

If the scope would be limited to vehicles under 40 km/h max design speed, which are estimated at 10% of the market, the projected savings will also be reduced by 10%. This has been taken into account in the comparison of options and in Annex 3 to this report.

7. HOW DO THE OPTIONS COMPARE?

When comparing the estimated economic impacts of the different policy options, the differences between them are the potential net savings for manufacturers and distributors, as well as for rental companies and end users ranging from between 18% (option 1a) to 21% (option 1b) and 22% (option 2) against the baseline costs. However, these differences suggest that a careful consideration of the proposed policy option is required so that the assumed beneficial effects for the internal market can be maximised.

As discussed above, the major driver of compliance costs is market delays. Most of manufacturers and distributors expect reduced delays under the harmonised system. However, none of the survey respondents believe that the delays will be cut out completely. Despite the common rules and regulations in the EU, the manufacturers and distributors expect that some administrative and technical requirements will remain.

As might be expected, policy options that require greater involvement of third party bodies would result in higher costs compared to other options that provide more independence to the manufacturer to manage the compliance procedures without external oversight. This cost difference may be mitigated by the fact that, as explained in option 2, manufacturers and distributors may still decide to have recourse to third party tests or checks even if it is not imposed by the legislation.

The following tables provide information comparing the policy options in terms of effectiveness (how each option achieves the specific objectives), efficiency (cost-benefit analysis) and coherence with other pieces of EU law.

Table 4. Comparison of policy options (PO) against the effectiveness criterion

	Objective 1: Eliminate barriers to market entry (in particular for SMEs), and reduce market delays in the introduction of new machines	Objective 2: Reduce compliance costs, and facilitate product innovation	Objective 3: Facilitate use of machinery across intra-EU borders	Objective 4: Ensure high and equal requirements and technical solutions for the road safety of non-road mobile machinery across the EU
PO0	0	0	0	0
PO1a	++	+	+++	++
	One harmonised full type-approval policy instead of 27 national ones will facilitate market entry and eliminate delays linked to multiple EU countries' approvals. The length of the harmonised procedure would be the longest, since for all components the road approval would involve a third party. However, this would be offset by far by the benefit of having a unique road approval allowing road circulation across the EU.	One harmonised full type-approval policy would eliminate the multiple approvals, so it would be beneficial. However, it is the most expensive option for manufacturers, distributors, rental companies and end users. It allows companies to save money on compliance costs so that they can invest more in innovation, although less than under the other options.	A harmonised full type-approval policy would grant equal requirements across borders, so it would facilitate the use of machinery across intra-EU borders.	The safety requirements and the technical specifications to comply with the safety requirements are integrated in the legislation, and third party conformity assessment is required for all components, therefore, it ensures high and equal requirements and technical solutions across the EU.
PO1b	+++/++	++	+++	+

	One harmonised simplified type-approval policy instead of 27 national ones will facilitate market entry and eliminate delays linked to multiple EU countries' approvals. The length of the harmonised procedure would be shorter than in 1a and offset by far by the benefit.	One harmonised simplified type-approval policy would eliminate the multiple approvals, so it would be beneficial. In addition, it is less expensive for manufacturers, distributors, rental companies and end users than the full type-approval. It allows companies to save money on compliance costs so that they can invest more in innovation (more than in 1a but less than in 2)	A harmonised simplified type-approval policy would grant equal requirements across borders, so it would facilitate the use of machinery across intra-EU borders.	The safety requirements and the technical specifications to comply with the safety requirements are integrated in the legislation and third party conformity assessment is required for critical components only, therefore, it ensures high and equal requirements and technical solutions across the EU, but it is less beneficial for road safety than option 1a.
PO2	+++	+++	+++	+/-
	One harmonised 'self-assessment' type policy, instead of 27 national ones will facilitate market entry and eliminate delays linked to multiple EU countries' approvals. The length of the harmonised procedure would be the shortest.	One harmonised 'self-assessment' type would eliminate the multiple approvals, so it would be beneficial. In addition, it is the least expensive option for manufacturers. However, this option implies possible reputational risks for manufacturers, distributors, rental companies and end users. It allows the highest savings on compliance costs, so that companies can invest more in innovation.	A harmonised 'self-assessment' type policy would grant equal requirements across borders, so it would facilitate the use of machinery across intra-EU borders.	Manufacturers can follow the harmonised standards or propose other solutions; hence, this option allows different technical solutions depending on the manufacturer. Therefore, 'equal' requirements and technical solutions would not be granted. In EU countries with looser legislation option 2 might be an improvement, but in EU countries with stricter legislation, option 2 might mean a step back in road safety enforcement.

The comparison between policy options 1a, 1b and 2 shows that option 1a and 1b are more effective than option 2 in terms of road safety but not in terms of reducing market delays and compliance costs.

In terms of costs, all options would allow companies to save money on compliance costs so that they can invest more in innovation. In addition, by not needing multiple design to match different approval rules, such innovation can be focussed on innovative features. This is even more the case in option 2, which is the least expensive option.

However, when it comes to road safety, while 'high' requirements and technical solutions could be equally met by all three options, 'equal' requirements and technical solutions would not be met by option 2. The reason for this is that the new approach allows manufacturers to either follow the harmonised standards or propose other solutions; hence, option 2 allows different technical solutions depending on the manufacturer. Such different technical solutions would be less coherent with the type-approval frameworks for other vehicles, and more complex to handle for rental companies and end users when in charge of individual approvals.

Indeed, under option 1 (a or b) the safety requirements, but also the technical specifications to comply with the safety requirements, are integrated in the legislation; this ensures high and equal requirements and technical solutions across the EU.

In option 2 the legislation includes only the essential safety requirements, but the detailed technical specifications can be either described in harmonised standards, which are voluntary, or alternative solutions can be proposed by manufacturers, who then should proof an equal level of safety. Therefore, option 2 can ensure high requirements and technical solutions; however, 'equal' requirements and technical solutions would not be granted by option 2, since it allows different technical solutions depending on the manufacturer. Such different technical solutions would be less coherent with the type-approval frameworks for other vehicles (cars, trucks, trailers, motorbikes, tractors, etc.) for which detailed and equal requirements are embedded in the legislation, and more complex to handle for rental companies and end users when in charge of individual approvals.

In addition to the better acceptability by Member States of equal technical solutions, option 1 foresees ex-ante checks of the entire machine by the authorities, as it is done in the approval frameworks for other vehicles, and even in some of the national frameworks (the more stringent ones), as opposed to the ex-post market surveillance proposed in option 2. Ex-ante approval by the authorities is more costly, but potentially safer, since machinery is checked before it circulates on the road. Option 1a requires conformity procedure with third party involvement for most components, systems and separate technical units, and presents the maximum stringency. Option 1b is more proportionate than 1a since it requires conformity procedure with third party involvement only for critical items (e.g., braking and steering).

The following Tables 5, 6 and 7 on alternative elements (mandatory/optional and scope) are relative, to be compared among themselves, for any given option selected in table 4 (1a, 1b or 2). However, it is explained later in this section how the estimated impacts of the three main options would be affected when the voluntary take-up and the limited scope of the companies affected are considered.

Table 5. Comparison of economic impacts on stakeholder groups (costs/benefits)[111] against baseline.

Policy option	Manufacturers and distributors	Rental companies and end users	Member States Authorities	Technical Services
Option 0: Baseline	Compliance costs will be at least as high as today: €3.561 million over 10 years, if not higher.	Compliance costs will be at least as high as today: €2.442 million over 10 years, if not higher.	Enforcement costs will be at least as high as today: €23 million over 10 years, if not higher.	No impact
Option 1a: Type-approval	Net average cost saving of 18% of their compliance costs (16% for large enterprises and 26% for SMEs): **€641 million over 10 years.**	Net average cost saving of 18% of their compliance costs: **€439 million over 10 years.**	Cost increase for most Member States, but negligible.	Increase in revenue
Option 1b: Simplified type-approval	Net average cost saving of 21% of their compliance costs (20% for large enterprises and 38% for SMEs): **€748 million over 10 years.**	Net average cost saving of 21% of their compliance costs: **€512 million over 10 years.**	Cost increase for some Member States, but negligible	Increase in revenue (lower than in 1a)
Option 2: CE marking	Net average cost saving of 22% of their compliance costs (21% for large enterprises and 39% for SMEs): **€783 million over 10 years.**	Net average cost saving of 22% of their compliance costs: **€537 million over 10 years.**	Cost decrease for some Member States, but negligible. Potentially offset by additional ex-post enforcement costs	Decrease in revenue

Table 6. Comparison of policy options against social and environmental impacts

Policy Options	Social impacts	Environmental impacts
Option 0	No change	No change
Option 1a: Type-approval	++ Detailed standards for road safety	+ Compliance with road circulation noise emission limits set up and third party tested
Option 1b: Simplified type - approval	++ Detailed standards for road safety	+ Compliance with road circulation noise emission limits set up and third party tested
Option 2: CE marking	+/- Harmonised standards for road safety, voluntary	+ Compliance with road circulation noise emission limits set up and self-certified by the manufacturer

Table 7. Comparison of policy options against the coherence criterion

	Policy Options	Net effect
PO0	No coherence, since the existing national rules are diverging among themselves and from the type-approval framework existing for other vehicles.	**0**
PO1a	This option would be coherent with the existing EU type-approval road safety framework for motor vehicles, but not for categories comparable to non-road mobile machinery, such as R (agricultural trailers) and S (agricultural interchangeable towed equipment), which are covered by the Machinery Directive as regards occupational safety.	+
PO1b	This option would be the most coherent, since this option would be similar to the existing EU type-approval road safety framework for categories R and S.	++
PO2	This option would stay coherent with the Machinery Directive, which follows the new approach. However, it would lack coherence with the rest of the road approval legislation, which follows the old approach. This option would be even less coherent than the baseline, which consists of current national approvals, many of which are type-approval systems.	-

[111] The 2019 costs and benefit study calculated economic impacts on stakeholder groups as net benefits.

Table 8. Comparison of mandatory/optional policy against the effectiveness criterion

	Objective 1: Eliminate barriers to market entry (in particular for SMEs), and reduce market delays in the introduction of new machines	Objective 2: Reduce compliance costs, and facilitate product innovation	Objective 3: Facilitate use of machinery across intra-EU borders	Objective 4: Ensure high and equal requirements and technical solutions for the road safety of non-road mobile machinery across the EU
Mandatory	++	++	++	++
	A mandatory policy for road circulation would facilitate market entry and eliminate delays linked to multiple EU countries' approvals.	A mandatory policy would imply costs for all manufacturers to adapt to the new requirements, including those selling in one EU country only. Member States will replace their current road approval systems by the new system.	A mandatory policy would facilitate the use of machinery across intra-EU borders.	A mandatory policy will contribute to higher safety standards for all road approvals.
Optional	++	++	+	+
	An optional policy for road circulation would facilitate market entry and eliminate delays linked to multiple EU countries' approvals.	An optional policy would imply costs for manufacturers to adapt to the new requirements when exporting, with the subsequent benefits of reducing the number of approvals. Non-exporting manufactures will not have the obligation to adapt. Member States will handle a double road approval system. Member states would bear additional costs; however, they are not expected to be significant.	With an optional policy, take-up would be lower and thus the use of machinery across intra-EU borders would be facilitated only partially.	An optional policy will contribute to higher safety standards for road approvals done under the new policy.

As regards whether the benefits for the relatively small share of mobile machines that are not exported compensate for the additional costs of maintaining the national rules on top of the EU rules in the case of an optional policy, it must be considered that the existing national rules are already implemented, and the costs for keeping them are minimal. The biggest cost for authorities would be the cost of having a new system in place, and this would happen with a mandatory option too, so this is not a difference. Moreover, Member States authorities do not regard this parallel system as a problem; they dealt with it already with categories R and S under Regulation 167/2013.

The comparison between a mandatory and optional policy shows that a mandatory policy would be more effective in facilitating use of machinery across intra-EU borders and ensuring equal road safety standards across the EU. Both options would be equally efficient in reducing compliance costs and facilitating product innovation, as well as eliminating barriers to market entry.

It is difficult to properly estimate the potential take-up of an optional policy. In section 1.3 it is explained that only 4% is sold in the EU country where production takes place. This may be taken as proxy to those machines intended for one market only, and/or those produced in small series, for which manufacturers may be more interested in applying for the national approvals. Taking this 4% as a proxy of the turnover that might stay under the current national approval because of manufacturers' choice, **the benefits calculated in Table 5 for each of the policy options would decrease by a 4%**.

Table 9. Comparison of policy scope with/without towed equipment against the effectiveness criterion

	Objective 1: Eliminate barriers to market entry (in particular for SMEs), and reduce market delays in the introduction of new machines	Objective 2: Reduce compliance costs, and facilitate product innovation	Objective 3: Facilitate use of machinery across intra-EU borders	Objective 4: Ensure high and equal requirements and technical solutions for the road safety of non-road mobile machinery across the EU
With towed equip.	++	++	++	-
	A policy covering all self-propelled and towed non-road mobile machinery would address the whole market.			Towed equipment already has dedicated frameworks, that may be expanded to cover any necessary categories
Without towed equip.	++	++	++	+
	A policy covering only self-propelled non-road mobile machinery would not tackle R, S and O category vehicles (estimated at 20% of the total market), considering the such categories are or can be already under existing type-approval legislation.			Avoids duplication of approval frameworks

The comparison between policy including all non-road mobile machinery or only self-propelled shows that including only self-propelled be more effective. Although including all towed equipment would allow covering the whole machinery segment, it would need better ex-post enforcement to prevent manufacturers misapplying the new policy for vehicles that fall better under existing type-approval legislation, at the expense of road safety. Indeed, most towed equipment can be already homologated today under the existing type-approval legislation for categories O (trailers), R (agricultural trailers) and S (agricultural towed equipment). Proposing in parallel a simplified framework for the same vehicles would create a dual system, with the risk of the simplified one becoming a 'catch-all' regulation or allowing 'cherry picking' by manufacturers.

By **including only self-propelled** non-road mobile machinery it is estimated that 20% of the non-road mobile machinery market would not be impacted by the new policy. In that case, the **benefits calculated in Table 5 for each of the policy options would decrease by 20%**.

Table 10. Comparison of policy scope with/without maximum design speed limit against the effectiveness criterion

	Objective 1: Eliminate barriers to market entry (in particular for SMEs), and reduce market delays in the introduction of new machines	Objective 2: Reduce compliance costs, and facilitate product innovation	Objective 3: Facilitate use of machinery across intra-EU borders	Objective 4: Ensure high and equal requirements and technical solutions for the road safety of non-road mobile machinery across the EU
All speeds	+++	++	+++	-
	A policy covering all non-road mobile machinery, independently of the maximum design speed, would address the whole market. However, it would require better ex-post enforcement.			A simplified framework is not fit for purpose for fast vehicles
Up to 40 km/h	++	++	++	+
	A policy covering non-road mobile machinery with a maximum design speed up to 40 Km/h only, would leave a part of the market uncovered, although small (10% of the self-propelled non-road mobile machinery market), considering that most non-road mobile machinery is designed for low road circulation speeds.			A simplified framework is fit for purpose for vehicle speeds up to 40 km/h

The comparison between policy including all speeds or not shows that, although including all speeds would allow covering the whole machinery segment, it would need better enforcement against misapplication of the new policy to vehicles that fall better under existing type-approval legislation, at the expense of road safety. Indeed, borderlines with existing type-approval legislation are naturally defined by the speed

limit, preventing any misuse of the new regulation ('cherry picking' by manufacturers / 'catch-all' regulation).

In addition, a maximum design speed limit would focus on slow machinery, which is the category that really needs a dedicated new policy, and which covers most of the market (around 90% of total), and on a simplified system. Indeed, 40 km/h is more in line with a simplified regulation, since for speeds under 40 km/h requirements are less stringent. Finally, a maximum design speed limit would discourage manufacturers to produce vehicles with design speeds higher than what is recommended for road safety reasons.

By setting a **maximum design speed limit at 40 km/h** it is estimated that not more than 10% of the non-road mobile machinery market would be not impacted by the new policy. In that case, the **benefits calculated in Table 5 for each of the policy options would decrease by 10%**.

Table 11. Comparison of stakeholder views on the policy options (majority of views)

Policy option	Member States road approval authorities	Manufacturers and distributors	Rental companies and end users	Technical services
PO 0: Baseline	-	-	-	-
PO 1a: Type-approval	-	-	-	Preferred
PO 1b: Simplified type -approval	**Preferred**	**Preferred**	**Preferred**	-
PO 2: CE marking	-	-	-	-
Directive	-	-	-	-
Regulation	**Preferred**	**Preferred**	**Preferred**	**Preferred**
Mandatory	**Preferred optional at first, and mandatory later on**	-	-	Preferred
Optional		**Preferred**	**Preferred**	-
Self propelled and towed machinery in scope	-	Preferred	-	-
Only self propelled machinery in scope	**Preferred**	-	**Preferred**	-
No maximum design speed limit		Preferred	-	-
Maximum design speed limit 40 Km/h	**Preferred**	-	**Preferred**	-

Both the technical specifications in option 1 and the essential safety requirements in option 2 would relate to the list of vehicle features detailed in Annex 5 as relevant for road safety. This list details the vehicle features that must be regulated in order to ensure safety on the road and would be the same for all options. As explain in section 5, the list was developed based on current national solutions and was discussed with the working group composed of the industry and user associations, Member States authorities and their technical services[112].

[112] Working document 'NRMM-2019.06 Technical requirements' summarising the findings of the targeted consultation carried out by the Commission on differences between member states requirements for the road circulation of non-road mobile machinery. Available in the library section of the CIRCABC interest group "New legislative initiative - Road circulation approval requirements for non-road mobile machinery".

Due to the very technical nature of these requirements, there are no real policy choices to be made on the technical specifications. The assessment of the main policy options would not change substantially if choices were made in relation to the additional design elements, because the main cost elements are not linked to the requirements, but to the requirements not being harmonised.

8. PREFERRED OPTION

8.1. Simplified type-approval, optional, covering self-propelled machinery only and with a maximum design speed limit up to 40 km/h

It seems more adequate for the new legal framework to be a type-approval system following the old approach, where technical specifications are detailed in the legislation, which is the widely accepted and trusted framework for road safety in Europe. This type-approval should be simplified to be proportionate and take account of the characteristics of non-road mobile machinery (low circulation frequency, special road circulation rules in EU Member States, many design specificities due to the work they are intended to perform and often manufactured by SMEs). There is a wide consensus on the fact that option 1b is the most effective, efficient and coherent.

A harmonised simplified type-approval policy for road circulation will have the following implications for the stakeholders involved.

- Manufacturers and distributors will: i) have an easier market entry ii) eliminate delays linked to multiple EU countries' approvals, iii) benefit from a reduction by a fifth of the compliance costs; iv) enhance their competitiveness in and outside the EU.

- Rental companies and end users will: i) benefit from a reduction by a fifth of the compliance costs; ii) easily use and re-sell machinery across intra-EU borders; iii) have more choice of non-road mobile machinery; iv) have access to more innovative designs.

- Member States authorities: will need to adapt to the new systems, however this is not seen as a problem or a significant burden by the affected authorities.

- Technical services: will need to adapt to the new system, and will see an increase on workload and revenue, although this may be mitigated by the fact that approvals will likely decrease in number since manufacturers will have to undergo them in one EU country only.

- Road users: will benefit from harmonised rules that ensure high road safety across the EU.

It is the most proportionate option, as thanks to the balanced combination of third party approval for critical vehicle features and self-certification for less critical vehicle features, it keeps compliance costs under reasonable limits. It is the most coherent option, since it is similar to the existing simplified type-approval legislation for comparable vehicle categories R (agricultural trailers) and S (agricultural interchangeable towed equipment).

An **optional** policy seems more adequate, to allow for manufacturers to either benefit from the new policy to streamline the market launches across the EU, or to keep applying for national approvals if more convenient for their business model. Although this results in a higher burden for authorities, that would need to keep a double approval system running, this seems not to be a major problem for them, since are already doing so in a number of areas (such as the R and S categories of towed equipment).

However, the **national systems** will still be an option for **individual approvals** (marketed only in one country) and **small series**. In such cases, manufacturers can either opt to apply the new legislation or keep applying for national approval. However, manufacturers who opt to follow national rules will not benefit from the free movement. Threshold limits for small series would be defined in the new framework.

The new framework will harmonise technical requirements for the road circulation of **self-propelled** machinery **only**, **since most of the towed equipment should be type-approved under other vehicle categories** (categories O, R and S).

The new framework will set up a **maximum design speed limit at 40 km/h** to the machinery in scope, which would be instrumental to avoid scope overlaps with the existing type-approval legislation and would prevent the application of the new framework to faster vehicles, at the expense of road safety. Faster vehicles will have to find their place in the full type-approval legislation, for the benefit of road users.

The new legislation will set up **maximum noise limits** not higher than the current limits in the tractors Regulation (EU) 167/2013, resulting in an environmental benefit. In addition, the new legislation will include a clause to have such limits revised to adapt to any improvements in the state of the art.

One-in, one-out: The total benefit of the initiative is estimated at €846 million over 10 years for manufacturers, distributors, rental companies, and end users, i.e., €84,6 million per year. Since the administrative cost is estimated at 4% of the total, the overall administrative saving is calculated as €3,38 million per year.

8.2. Choice of the instrument: a regulation.

The new legal framework will set out the technical requirements to be complied with when granting EU type-approval. Both the enacting terms and their annexes will be highly detailed and leave practically no room for discretion of Member States when transposing them. In addition, the requirements are highly technical, detailed, and subject to regular adaptations to technical progress. Regulations are used for all type-approval of vehicles, including Regulation 167/2013 covering tractors, agricultural trailers, and agricultural tower equipment (categories ‘R’ and ‘S’). Consequently, a regulation is preferred.

The co-decision act will list all **vehicle features relevant for road safety** when the non-road mobile machinery is circulating on the public roads. On the contrary, vehicle features relevant for occupational safety when the mobile is performing the work for which it has been designed, will continue to be regulated exclusively by the Machinery Directive. Annex 5 to this report describes the safety features that would be covered by the new legal framework. The co-decision act will also include a transitional period from the entry into application of the new regulation, after which the new framework will be mandatory for the non-road mobile machinery in scope.

D**elegated acts** will be adopted to prescribe in detail the technical and administrative requirements as well as conformity assessment procedures to be followed by manufacturers. Manufacturers would present for each vehicle feature, depending on its criticality for road safety, different types of documentation, such as a third party test report, a manufacturer's test report, manufacturer's drawings, schematics, etc. (assessed by a third party or directly by the authorities), a manufacturer's certificate, a type-approval certificate, etc.[113] The type-approval authority would check all the documentation for the entire machine.

The non-road mobile machinery fulfilling the requirements laid down in the new regulation will not be subject to any further technical requirements in the Member States. National vehicle **registration** (and issue of a **license plate** for road circulation) and any machine **circulation permits** will stay under the responsibility of each Member State but will not justify any additional testing or technical requirements. The new framework will not affect Member States prerogative to regulate **non-technical requirements** for road circulation such as speed limits, prohibition to circulate in certain areas (such as maximum weights allowed for certain bridges, or maximum weights allowed to drive across a town), driver licence requirements, etc.

9. HOW WILL ACTUAL IMPACTS BE MONITORED AND EVALUATED?

Once implemented, the actual impacts of the chosen policy option need to be monitored and compared to the objectives and the expected impacts. A Commission's Expert Group on the road circulation of non-road mobile machinery is being set up with all stakeholders of the non-road mobile machinery sector. This group will meet at regular frequency to analyse and follow-up of the implementation of the regulation in all EU countries.

At least the following indicators are proposed to collect the necessary information:

1. Number of EU approvals for new non-road mobile machinery granted in each Member State;
2. Number of national approvals granted in the calendar year previous to the entry into force of the new regulation, and the number of national approvals for new non-road mobile machinery granted in each Member State every year after;
3. Reporting on road accidents with non-road mobile machinery by Member States;
4. Direct costs of compliance: This indicator can only be assessed through a survey-based exercise, as conducted in the framework of the impact assessment study. Conducting such a survey again after full implementation of the new legislation would provide a comparative figure;
5. Indirect costs of compliance (market delays): through a survey-based exercise, after full implementation of the new legislation.

Table 12. performance indicators[114]

[113] List non-exhaustive.

[114] As regards possible synergies in data collection with other initiatives such as the Machinery directive, a new dedicated reporting is not proposed. In addition, considering that road authorities are different from the authorities dealing with the Machinery directive, no easy synergies could be found.

Indicator	Definition	Unit of measurement	Data source	Frequency	Baseline
Use of EU type-approvals	Number of EU type-approvals for new non-road mobile machinery granted in each Member State	Number of EU approvals granted	Member States	4 years after the entry into application of the new regulation	Zero
Use of national approvals	Number of national approvals for new non-road mobile machinery granted in each Member State	Number of national approvals granted	Member States	4 years after the entry into application of the new regulation	Average of the number of national approvals granted in the 5 last calendar years[115] previous to the entry into application of the new regulation
Road accidents	Reporting on road accidents with non-road mobile machinery by Member States	Number of accidents, seriousness of accidents	Member States	4 years after the entry into application of the new regulation	NA (disaggregated data not available in most countries)
Direct costs of compliance with EU type-approval	Direct cost of compliance for EU type-approval per each new type of machinery	Euro	Stakeholder survey	4 years after the entry into application of the new regulation	Direct cost of compliance for national approval of a similar machinery type
Indirect cost savings with EU type-approval	Indirect cost savings with EU approval per each new type of machinery	Euro	Stakeholder survey	4 years after the entry into application of the new regulation	Indirect cost of compliance with national approvals for similar models before the EU type-approval was in place

The new regulation **should be evaluated within 5 years after its entry into force**.

[115]An average is proposed, as one specific year may be affected by extraordinary circumstances and thus be not representative.

Annex 1: Procedural information

1. LEAD DG, DECIDE PLANNING/CWP REFERENCES

This initiative on the harmonisation of technical safety requirements for the road circulation fills a gap in the single market for non-road mobile machinery, and thus contributes to ensuring a deeper and fairer single market, which is one of the Commission's priorities.

The lead DG for this initiative is the DG for Single market, Industry, Entrepreneurship and SMEs (DG GROW). The Directorate in charge is Directorate H - Construction & Machinery.

The initiative is coded in Decide Planning with the reference 2017/GROW/003.

2. ORGANISATION AND TIMING

The timing for adoption of the new act by the Commission is March 2023.

The Inter-service consultation took place in September/October 2022.

3. CONSULTATION OF THE RSB

This impact assessment was sent to the RSB on 10/11/2021.

A meeting with the RSB took place on 8/12/2021.

The RSB issued its opinion on 10/12/2021, following which this impact assessment was revised as follows:

RSB recommendations	Revisions introduced
(B) Summary of findings	
(1) The report does not sufficiently explain why mutual recognition does not work in this sector and why promoting the respect of the mutual-recognition principle is not one of the policy options.	Section 2 on problem description now discusses in more detail why mutual recognition does not function in the non-road mobile machinery sector, despite being an area of technical regulation without EU harmonisation. In addition, the analysis on why mutual recognition does not work and would not work in the future has been further expanded in sections 5.1 and 5.3, explaining why a policy option aiming to promote the practical implementation of the mutual recognition principle was discarded.
(2) The report does not provide convincing evidence that a lack of harmonised rules results in more accidents involving non-road mobile machinery. It does not justify why the initiative aims at equal requirements and technical solutions for road	Section 7 explains better why harmonised requirements would likely increase the level of road safety of non-road mobile machinery across the EU, and why road safety requires equal requirements and technical solutions, and not just sufficiently high requirements. This supports the choice of the preferred option, since a main determining factor is its higher score on road safety. The assessment of the options in section 6 explains how this initiative will contribute specifically to road safety and specifies

safety.	whether all options can deliver on the objectives. Section 4 on specific objective discusses the limitations of road safety as an objective of the new policy, and how, despite this, road safety would be enhanced by the adoption of the proposed policy.
(3) The report is unclear about the methodology used to estimate costs and cost savings. It does not present the reliability and robustness of the evidence base.	Section 2 on problem description provides now a clear overview of the different cost categories, describing in more detail the costs incurred by each of the affected groups (manufacturers, distributors, rental companies, end users and authorities). Section 2 explains as well how indirect costs are estimated and discuss whether they are realistic or risk to be overestimated, and specifies which costs and savings correspond to. Additional clarifications on the methodology used to estimate costs and cost savings, the sources of information and main assumptions, have been added in sections 2 and 6, as well as in this Annex 1, where the reliability of the estimates has been assessed, as well as the possible uncertainties affecting the evidence base.
(4) It is unclear why the report does not assess the additional design elements as part of the main policy options. It does not explain to what extent the assessment of impacts and the choice of the preferred option would change if these design elements were taken into account in the analysis.	The report justifies in section 6 why additional design elements affecting the obligatory nature as well as the scope of harmonised rules are assessed separately from the main policy options. In section 7, it also calculates the impacts as a result of the choices made on these design elements. In particular, the report considers in section 7 how the estimated impacts would change if EU and national rules coexist or if the scope of application is narrowed. It also clarifies that the choice of the preferred option would not change in light of these specific design elements. The costs and benefits in the standardised table in Annex 3 has been changed to incorporate the additional design elements that are part of the preferred option.
(C) What to improve	
(1) Mutual recognition	The problem description section 2 discusses in more detail why mutual recognition does not function in the mobile machinery sector, despite being an area of technical regulation without EU harmonisation, and why as a consequence there is no policy option aiming to promote the practical implementation of the mutual recognition principle.
(2) The problem description should provide a clear overview of the different cost categories.	The problem description section 2 describes in more detail the costs incurred by manufacturers due to market entry delays, distinguishing them clearly from the direct costs, and how they are estimated, per each of the affected groups (manufacturers, distributors, users, rental companies and authorities). Annexes 1 and 4 include more details on data limitations and calculation methods.
(3) Why harmonised requirements	Section 6 explains why harmonised requirements would likely increase the level of road safety of mobile machinery across the EU, and why road safety requires equal requirements and technical solutions, and not just sufficiently high requirements.
(4) Road safety as secondary objective	Section 4 explains clearly that that road safety is a secondary objective rather than one of the main specific objectives. Section 6 clarifies how this initiative will contribute specifically to road, and how and to what extend each of the options can deliver on the objectives set.
(5) New policy versus implementing legislation.	Section 8 clarifies what is decided now, based on this impact assessment, and what will be decided later through implementing legislation.

(6) Methodology used to quantify costs and savings	Section 6 presents the sources of information and main assumptions, providing more detail in Annexes 1 and 4, assessing the reliability of the estimates and possible uncertainties affecting the evidence base.
(7) Assessment of additional design elements	Section 6 explains why additional design elements affecting the scope and take up of harmonised rules are assessed separately from the analysis of the main policy options and considers how the impacts would change as a result of the choices made on these design elements. The costs and benefits table in Annex 4 include the additional design elements that are part of the preferred option.

4. EVIDENCE, SOURCES AND QUALITY

Two studies supporting this impact assessment were carried out by external contractors: a 'Study on the EU harmonisation of the requirements for the road circulation of non-road mobile machinery'[116] and a complementary 'Cost-benefit analysis study for impact assessment on road circulation of non-road mobile machinery'[117]. The Commission's consultants carried out a number of interviews and complemented them through desk research.

The Commission gathered also evidence through public and targeted consultations, four workshops held with all stakeholders and several other meetings with stakeholders.

Sources have been chosen as reliable as possible. Similar data were cross-checked whenever possible. It is acknowledged that some data are estimates; in order to compensate for possible inaccuracies, throughout this document benefits have been estimated in a conservative manner.

Quantification of impacts has been consistently attempted, but sometimes limitations of data have made possible only a qualitative analysis.

- **A lack of granularity in the categorisation** of the non-road mobile machinery sector in the structural business statistics, where PRODCOM codes do not allow a high degree of accuracy (see Annex 4). In such cases, a proxy was used when possible;

The baseline figures of the cost and benefit conducted in 2019 study complemented the findings of the previous study conducted in 2016. According to the analysis conducted in 2016, the total compliance costs for manufacturers account for €1.5 billion. The 2019 analysis was building on these figures but amending the methodology to better represent market composition. The main difference between figures in both studies lies in the methodological approach to extrapolation of the sample. In the 2019 a tailored approach to capture the different capacities of EU Member States was chosen, while the 2016 study looked at the EU as a whole. Another major difference in these studies is the sample itself. First, the second study received more survey responses. Second, the data collection process included more detailed questions to the manufacturers and distributors. These features improved the precision of the analysis and produced more reliable

[116] "Study on the EU harmonisation of the requirements for the road circulation of mobile machinery". ECORYS, 2016.
[117] "Cost/benefit analysis study for Impact Assessment on road circulation of Non-road mobile machinery", PPMI, 2019.

conclusions. Despite these methodological differences, both studies found that the most important driver of the compliance costs is the market delays that manufacturers (and distributors) incur due to differences in the legislation of the EU Member States.

The cost and benefits study team consulted 90 economic operators, of which:

- 39 were manufacturers of non-road mobile machinery (of which 30% SMEs) from 11 Member States, representing around 50% of the total industry turnover.
- 37 rental companies and end users, 95% of which were SMEs, across 11 EU Member States.

Compliance costs for manufacturers and distributors were estimated at 4% of the industry's revenue.

Compliance costs for rental companies and end users were estimated as follows:

1. Data collection though surveys, interviews and desk research. Including reviewing the survey answers for their plausibility and logic and filling in missing answers based on the available data and assumptions.
2. Calculation of direct and indirect baseline and harmonisation costs for each survey respondent based on the cleaned (and imputed where necessary) survey questionnaire answers.
3. Calculation of total baseline and harmonisation costs for each survey respondent over ten years using a recommended 4% discount rate.
4. Calculating total NRMM volumes in the EU based on PRODCOM market data. Since there was no market turnover data available for rental companies and end users, production data expressed in units sold was used.
5. Deriving total baseline and harmonisation costs for each survey respondent per one unit of non-road mobile machinery they use/rent. Deriving an average baseline and harmonisation cost per one unit of NRMM for those respondents whose costs were greater than zero (about one third of all respondents).
6. Calculating total baseline and harmonisation cost to rental companies and end users in the EU, using average cost for the share of respondents whose costs were greater than zero and the number of non-road mobile machinery units used in the EU.

The 2016 study estimated the EU production value at €10.3 billion. The 2019 costs and benefit study updated the estimate, giving an EU production value of €11.9 billion. The EU production value has been recalculated with 2019 data to €12.5 billion, which is the one considered in this report. In all cases, the production value under the different codes has been corrected by applying the % of machinery that is NRMM, as agreed with the sector experts during the 2016 study.

It was assumed that only direct costs differ by the policy options. Indirect costs (measured though the cost of market delays) were assumed to be constant as they relate to divergent requirements. The next step was to calculate the present value of the compliance costs for each of the survey respondents at the baseline and for all of the policy sub-options. Baseline and potential harmonisation costs were later extrapolated to match the whole industry based on the total turnover of the EU non-road mobile machinery market.

- **Limitations on accidents data**, where non-road mobile machinery data are not isolated in national statistics.

As regards limitations on accidents data (of which more details are provided in Annex 2), most countries present non-road mobile machinery data together with tractors data, without distinction. In addition, causes of accidents are not available, hence it is difficult to capture if and how many accidents are due to a lack of necessary safety requirements for the road circulation of non-road mobile machinery in some EU countries. Despite this, there is consensus in that a harmonisation of safety requirements across the EU will have positive effects on the level of safety on the road across the EU.

Annex 2: Stakeholder consultation

Annex 2.1 Chronological overview

Numerous consultations over this file have been taking place over time, as follows:

- In 2016:
  - Surveys to 35 stakeholders as input for a study on the EU harmonisation of the requirements for the road circulation of non-road mobile machinery carried out in 2016[118];
- In 2017:
  - Feedback on the Inception Impact Assessment[119];
  - Workshop 1: organised in June 2017, aiming at collecting views from the national authorities (ministries of transport) on the possible policy options forward;
- In 2018:
  - Workshop 2: organised in February 2018, for a more in-depth discussion on the preferred policy option and initiating a debate on technical requirements[120];
- In 2019:
  - Surveys to 90 stakeholders as input for a costs and benefit study carried out in 2019[121];
  - A targeted consultation for Member States in 23 EU languages was carried out between May and September 2019 via EU survey[122];
  - Workshop 3: organised in December 2019, addressed to member state authorities, technical services, notified bodies and Europe-wide stakeholder organisations, to share the outcomes of the costs and benefits study and the targeted consultation, and to further discuss the policy options, scope and technical requirements[123];
- In 2020:
  - A public consultation in 23 EU languages via EU survey was launched and open during 12 weeks from Nov. 2020 to Feb. 2021[124];
- In 2021:
  - Workshop 4: organised in May 2021 with all main stakeholders, to share the main findings of the public consultation process and make progress on policy options, scope and technical requirements[125].

---

[118] "Study on the EU harmonisation of the requirements for the road circulation of mobile machinery". ECORYS, 2016.

[119] Available at: https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/1198-Road-circulation-requirements-for-mobile-machinery_en.

[120] Working documents are available in the library section of the CIRCABC interest group "New legislative initiative - Road circulation approval requirements for non-road mobile machinery".

[121] "Cost/benefit analysis study for Impact Assessment on road circulation of Non-road mobile machinery", PPMI, 2019.

[122] Working document 'NRMM-2019.03 MS Targeted Consultation Feedback' summarising the findings of the targeted consultation carried out by the Commission on differences between member states approval systems for the road circulation of non-road mobile machinery. Available in the library section of the CIRCABC interest group "New legislative initiative - Road circulation approval requirements for non-road mobile machinery".

[123] Working documents, such as 'NRMM-2019.07 Draft Minutes Workshop NRMM 9 Dec 2019 rev1' summarising discussion with stakeholders, are available in the library section of the CIRCABC interest group "New legislative initiative - Road circulation approval requirements for non-road mobile machinery".

[124] Public consultation outcomes available at: https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/1198-Road-circulation-requirements-for-mobile-machinery/public-consultation_en.

- In 2022:
    - Workshop 5: organised in June 2022 with all main stakeholders, to share and gather feedback on the main features of the legislative proposal for the road approval of non-road mobile machinery under preparation[126].

In addition, several bilateral meetings with stakeholders have been organised for a deeper analysis on certain aspects of the file.

Annex 2.2 Inception Impact Assessment (IIA)

The Inception Impact Assessment for this initiative was launched in 2017, with a feedback period running from 20 November 2017 to 18 December 2017. The number of total responses were 19, of which 10 from manufacturers and users associations, 8 from companies and 1 from a EU citizen. A majority of the respondents (15) expressed support for harmonising the safety requirements for the road circulation of non-road mobile machinery.

Annex 2.3 Studies

- **Study on the EU harmonisation of the requirements for the road circulation of mobile machinery (Ecorys, 2016).**

The aim of this study was to substantiate the problem analysis and assess it in a qualitative and quantitative manner and compares costs and benefits of possible solutions (policy options).

To address the objectives of the study, first the contractor defined the sector based on Eurostat PRODCOM codes (including expert judgement from sector representatives). Then they conducted a technical investigation based on desk research, interviews and legislative review, outlining the key requirements causing difficulties for the industry and the areas of strongest divergence between Member States. Finally, they quantified the problem and its impacts and compared them based on the Standard Cost Model (SCM) and a sector survey with 29 manufacturers capturing almost 70% of the EU market.

- **Costs and benefits of the policy options for EU harmonisation of the requirements for the road circulation of non-road mobile machinery (PPMI, 2019)**

This study built on the existing evidence, updating, improving and filling in the gaps to measure the possible economic impacts of different harmonisation options. The cost-benefit analysis conducted in this study provided the evidence base for identifying the best policy option, with the largest long-term net benefit for society, including the affected economic operators and EU citizens in all the EU Member States.

This study estimated the the costs and benefits of harmonisation through surveys, interviews and desk research. The study team consulted 90 economic operators, of which

[125] Working documents, such as 'NRMM-2021.05 Draft Minutes Workshop NRMM 6 May 2021' summarising discussions with stakeholders, are available in the library section of the CIRCABC interest group "New legislative initiative - Road circulation approval requirements for non-road mobile machinery".

[126] Working document 'NRMM-2022.02 220608_Presentation Workshop NRMM 08.06', available in the library section of the CIRCABC interest group "New legislative initiative - Road circulation approval requirements for non-road mobile machinery".

39 were manufacturers of non-road mobile machinery, representing around 50 % of the total industry turnover. They also defined the sector based on PRODCOM data, which allowed data for the entire EU market to be extrapolated. The findings of this study, therefore, represent the net benefit of harmonisation of the requirements for road circulation throughout the EU.

The study covered all stakeholder groups: manufacturers, intermediaries, end users, third parties and Member State authorities. It utilised the existing data on road safety and road accidents in the EU. However, the limited availability of the existing data constituted the main limitation of the study. Overall, the lack of statistics on non-road mobile machinery road accidents combined with expert interviews suggest that such machines do not cause many accidents on public roads. Another limitation stemmed from many MS authorities finding it very difficult to contemplate the potential costs that harmonisation would bring. Therefore, their survey data must be treated with some caution.

Annex 2.4 Workshops

- Workshop in June 2017, collected views from the national authorities (ministries of transport) on the possible policy options forward. The objective of the workshop was to investigate the potential effects of a change from the existing nationally regulatory approaches to EU harmonised legislation based entirely or partially on "new approach" principles (certification by the manufacturer based on technical documentation and self-testing and/or certification by notified bodies, as well as technical specification in European harmonised standards).

- Workshop in February 2018 allowed a more in depth discussion on the policy options available and initiating a debate on technical requirements;

- Workshop in December 2019, addressed to member state authorities, technical services, notified bodies and Europe-wide stakeholder organisations, to share the outcomes of the costs and benefits study and the targeted consultation, and to further discuss the policy options, scope and technical requirements;

- Workshop in May 2021 with all main stakeholders, to share the main findings of the public consultation process and make progress on policy options, scope and technical requirements. The policy option for a simplified type-approval regulation was identified as preferred, with wide stakeholder consensus.

Annex 2.5 Targeted Consultation to Member States' authorities

The purpose of the targeted consultation was to gather Member States views on a new EU legislation, their current conformity assessment procedures of the non-road mobile machinery and the efforts needed by their authorities to enforce new harmonised rules. **19 Member States replied**.

17 Member States were in favour of a new EU legislation for the following reasons:

- To implement a real single market also for this sector.
- To reduce certification costs for manufacturers who sell non-road mobile machinery in several European countries, as well as the costs of compliance and research and development.

- Because the primary purpose of the machine is not road circulation.
- To avoid the burden for authorities to adapt all technical provisions in the MS to the technical progress in all Member States. Some noted that approval authorities in charge to check the total technical file are mainly administrative authorities and do not have the competency for all types of different machinery and different very specific technical aspects.
- To guarantee a minimum common level of road safety in Europe.

2 Member States were against, arguing that non-road mobile machinery traffic has not resulted in a high number of accidents, or not highlighted as a problem.

Current conformity assessment procedures for non-road mobile machinery are of following types, depending on the Member State:

- **Based on a third party testing/approval**: Austria, France (for agricultural self-propelled machinery only, but not for construction machinery), Germany, Italy, Portugal, Slovak Republic, Spain; or
- **<u>Not</u> based on a third party testing/approval:** Belgium, Cyprus, Denmark, Estonia, Finland, Greece, Ireland, Latvia, Luxembourg, Malta, Romania, Sweden:
    - Based on documentation from the manufacturer (Belgium, Luxembourg, Greece)
    - Based on internal production control (Estonia)
    - CE Declaration of Conformity Machinery Directive (Finland, Latvia)
    - In-house certification (Sweden)

Additional efforts needed by Member States authorities to enforce harmonised rules on the requirements for the road circulation of non-road mobile machinery. Among the 19 authorities responding:

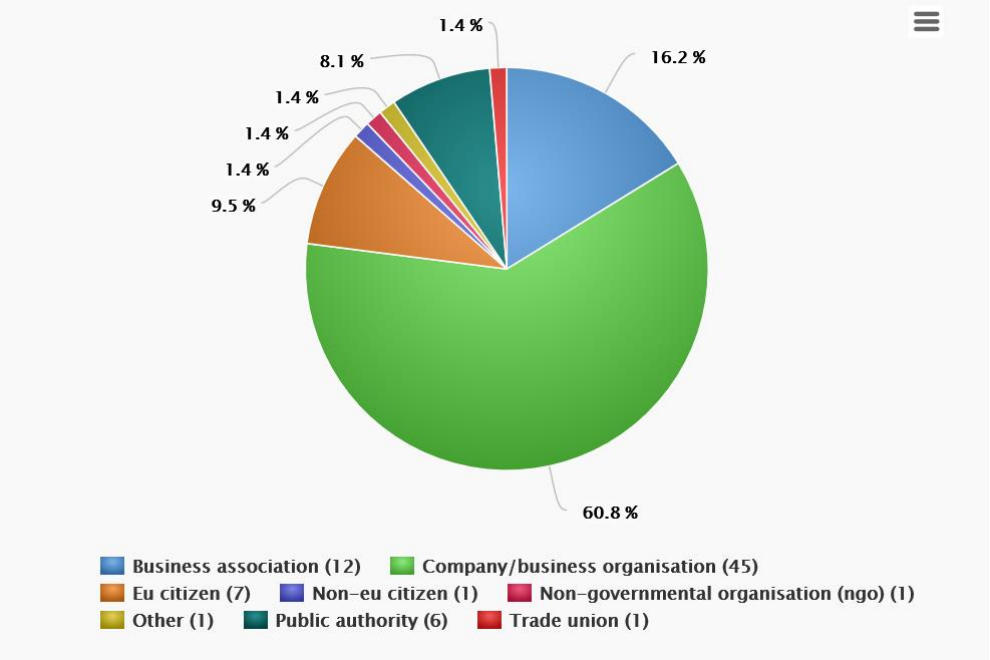
- 4 MS expected limited effort (<5%): Cyprus, Germany, Italy, Sweden
- 12 MS expected some effort (<20%): Austria, Luxembourg, Finland, Latvia, Belgium, Romania, France, Estonia, Spain, Malta, Slovakia, Portugal
- 3 MS expected significant effort (>20%): Denmark, Ireland, Greece. It requires resources for implementation, communication with stakeholders - including enforcement, internal training, etc. Depending on the model chosen for the harmonized rules, the scope may be larger or smaller, but in any case, much more work is expected than in a day when manufacturers simply have to live up to requirements and standards (Denmark)

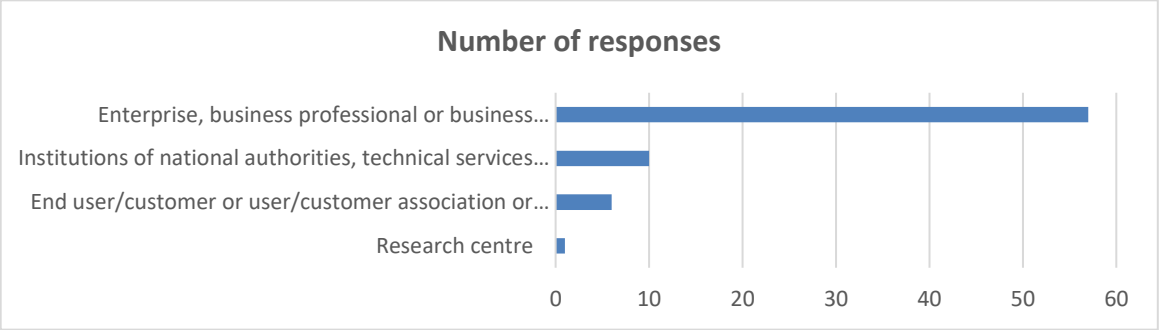
Annex 2.6 Public Consultation

The consultation was open during 12 weeks between 10 November 2020 and 2 February 2021 via the EU Survey online system in 23 EU languages, and received **74 answers**.

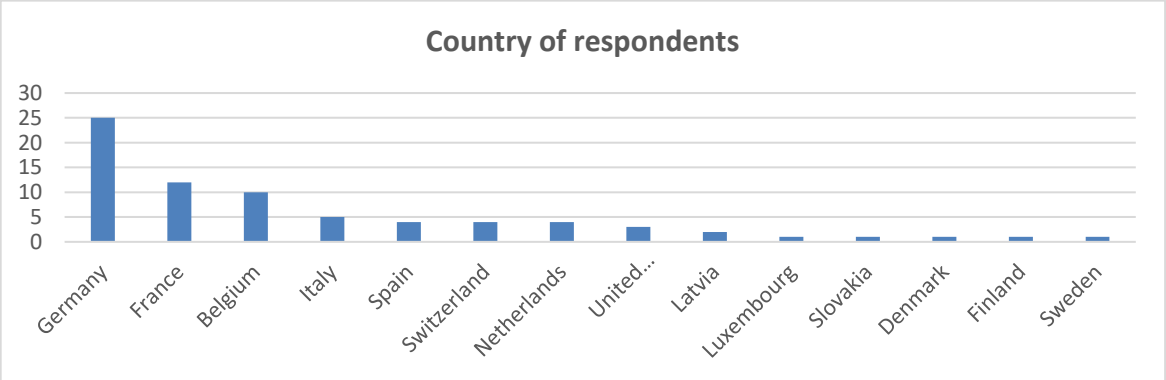
- **Questions 1 to 21 aimed at characterising the respondents in several stakeholder groups**

Responses **by stakeholder type:**

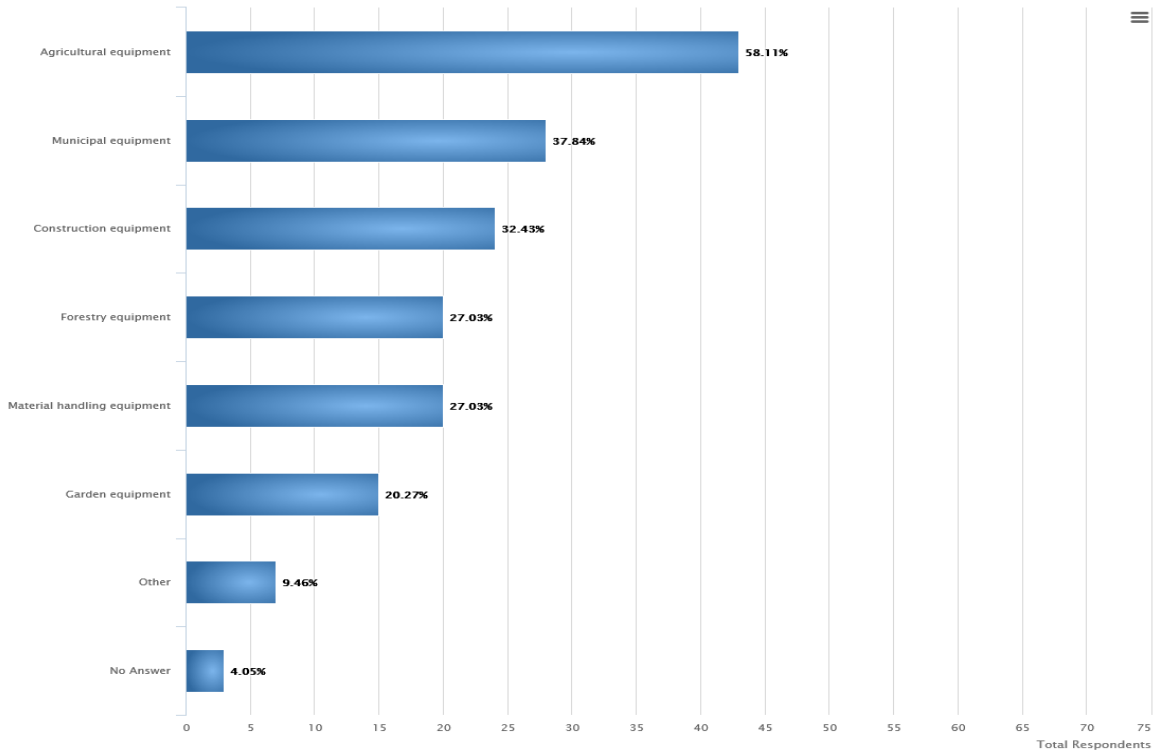




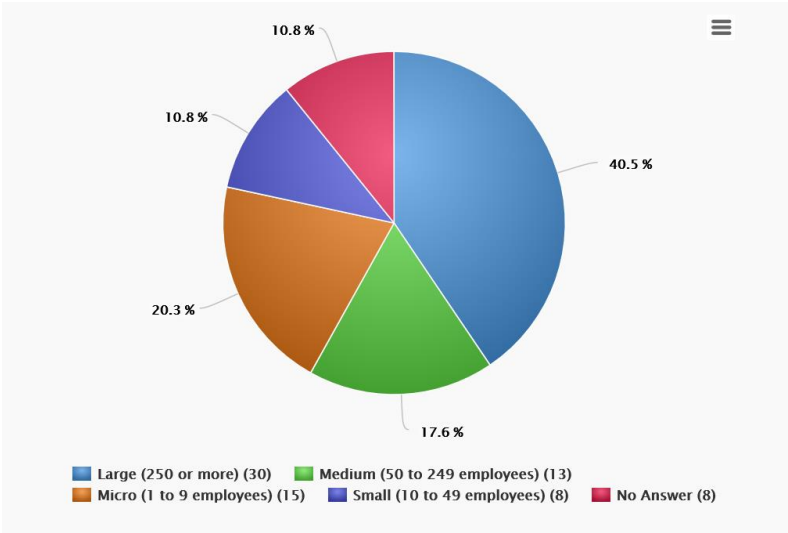
Responses **by country of origin:**



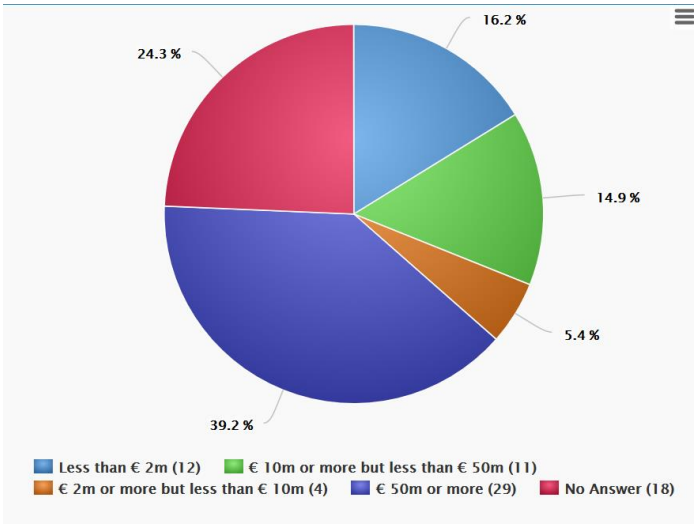
Responses **by sector of activity:**



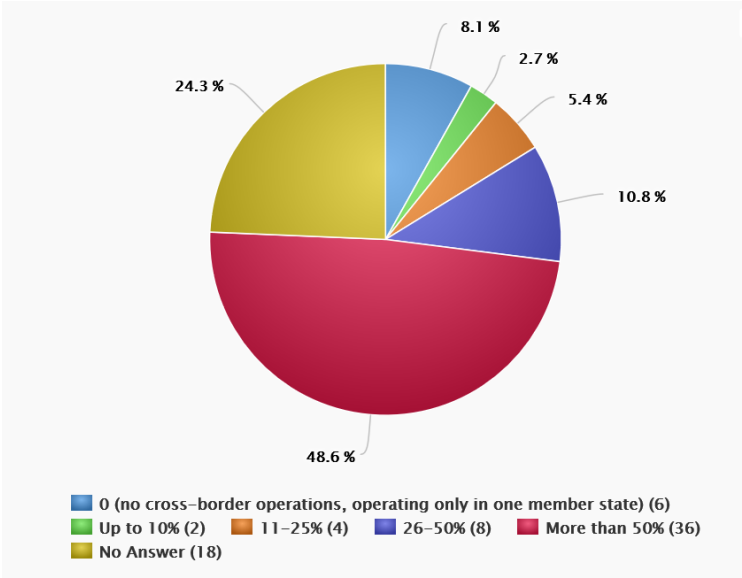
Responses **by organisation size:**



Responses **by yearly turnover size:**



Responses **by percentage of sales / acquisitions involving intra EU annual trade:**



- **Questions 22 to 31 aimed at characterising the extent of the problems this initiative aims to address.**

As regards **questions 22 and 23 on knowledge about accidents linked to the non-road mobile machinery circulating on public roads**, 36 out of 74 respondents replied to be aware of such accidents in their country, among which 31 referred to road accidents that led to the personal injury of one or more persons.

The lack of specific statistics available on this subject was mentioned, and when existing, the lack of disaggregated data to identify the vehicle types involved and the causes of the accident. Despite this, respondents mentioned accidents related to heavy equipment, such as street sweeper trucks and larger construction equipment, related to the moves of large equipment with operational devices operating under the cab or behind the driver, or related to operations that require constant reversing. Other accidents mentioned relate to refuse collection vehicles (RCV), stability issues, braking or steering, lack of visibility,

poor maintenance (e.g. broken lamps) particularly in old machinery, or a wrong behaviour of the driver.

As regards **question 24 on whether certain vehicle features are a cause or a contributor to these accidents**, the following were mentioned:

Vehicle features	Cause or contributor to accidents
Vehicle performance & control (braking system, steering system, turning radius, maximum design speed, speedometer)	• Manipulation of the maximum vehicle speed • Leaving the driver's seat and the vehicle without the parking brake activated. • Mobile machines is that are overlooked by other road users, especially because of the difference in speed • When braking, the load concentrates on the front and detaches itself from the main frame.
Vehicle masses, dimensions and structure (maximum authorized mass, maximum length /width /height, vehicle structure integrity, swinging upper structure)	• Different handling of maximum dimensions at national level leading to problems with road safety when crossing borders. • Height and width • Upper structure • Stability issues due to loads at speed
Road surface protection (maximum axle loading, maximum surface contact pressure, tyres and tracks)	• Tyre plated/air loss
Vehicle awareness (audible warning device, lighting, signalling installation, side reflectors, rotating beacon, external sound level)	• Mobile machines often turn into places where normal traffic does not, such as driveways to fields, small forest roads, construction sites. Thus, other road users do not expect the vehicle to turn there; this is especially dangerous at left turns • Marking of the width of the vehicle not good enough • Low position of headlights; recommendable to have high-positioned headlights with turning signals, brake lights and make-up lights on slow-moving vehicles where there are often cars right behind that hide the headlights • Reversing or sudden movements of large construction equipment or street sweeper trucks
Operator vision (field of vision, windscreen wipers, rear-view mirrors, sun visor, glazing and installation)	• Impairment of visibility by persons or goods (e.g. to the rear or to the side, where other vehicles or bicycles can be overlooked, or where the road border cannot be seen correctly and the machine may trespass and fall in a ditch). Camera solutions could alleviate the blind spots caused by the design of these machines • Obstructed view due to inappropriate attachments • Obstructed view due to attachments exceeding the front dimension (also due to deviating national requirements) • Poor visibility of sweeper's operational devices under or behind the driver's cabin coupled with human tendency to lean or observe the operational equipment.
Vehicle components related to functional safety (vehicle structure integrity, heating /ventilation/filtration systems, mechanical couplings/towing devices, fuel tank pressurization and leakage, guards and fenders, operator controls related to circulation, unauthorised use prevention)	• Stability issues due to design issues (stability criteria calculation errors) • In vehicles with an open cab, the driver is unprotected from hazards in road traffic • Trailer incorrectly coupled/defective coupling device • Deficiency related to load or carriage of persons
Other	• Inappropriate attachments • Continuous reversing of construction equipment in populated areas

	• Operating errors • Deficiencies in the condition of the vehicle

The following country statistics were provided:

Netherlands: The Dutch Safety Board established in 2010 that the width of the construction vehicle, in combination with narrow roads, is a major cause of accidents, as well as the fact that the driver's view is often blocked by parts of the vehicle, tools or charge. In addition, the Dutch Safety Board concluded that the visibility and recognizability of agricultural vehicles in the dark could be a problem. These conclusions are based on an in-depth investigation of 11 serious accidents (in which a serious road injury or death occurred) and the study of 73 fatal accidents involving agricultural vehicles[127].

Over a period of ten years (2006-2015), an average of 11 road deaths per year in the Netherlands were registered in accidents involving agricultural vehicles. Compared to the early 1990s, the average number of road deaths resulting from accidents involving an agricultural vehicle increased from 1% to 2% of the total number of road deaths in the Netherlands. Agricultural vehicles include agricultural and forestry tractors (tractors) as well as self-propelled work equipment used for agriculture, construction, ground, road and hydraulic engineering and green maintenance. Due to ever-increasing scaling up in agriculture, companies own more and more lots spread over a larger area, which means that their agricultural vehicles travel greater distances on public roads.

France: The ONISR (National Inter ministerial Observatory for Road Safety) centralises accident data, although non-road non-road mobile machinery is not isolated in these statistics. The ONISR databases distinguish in particular light vehicles, heavy goods vehicles, mopeds, agricultural tractors, etc. Assuming that the categories "special machinery" and "other vehicles" correspond to non-road non-road mobile machinery (special machinery + public works machinery + self-propelled agricultural machinery), the below data were obtained[128]:

Cumulative yrs. 2015-19	Total accidents	Killed in accident	Killed in vehicle	Injured in vehicle
Special machinery	553	62	15	274
Other vehicles	1691	86	38	904
Total	2244	148	53	1178

Italy: Italian authorities made an evaluation for agricultural machinery accidents on public roads related to years 2010 – 2015. Data were coming from ISTAT (Italian National Institute of Statistics) and regarded cases where at least one person was injured and at least one agricultural machinery was involved. Unfortunately, ISTAT does not distinguish between agricultural tractors and other agricultural machinery (e.g. combines or sprayers). However, it was assumed that most of the cases were related to agricultural tractors, because statistically their presence on the road is more common. Some findings from this evaluation were the following:

- Only 0.2 % of all road accidents saw an Ag machinery involved;

[127] https://www.swov.nl/feiten-cijfers/factsheet/landbouwverkeer (in Dutch)
[128] Accidents involving self-propelled agricultural machinery could sometimes be registered under the category 'agricultural tractors'. The number of accidents is therefore indicative and to be taken with care.

- On average, around 250 accidents per year where the root-cause is associated to the machinery and/or its driver;
- About 80% of these accidents were generated by a wrong behaviour of the driver;
- As for the other 20%, considering average age of machinery (> 20 years), cases were mainly related to poor maintenance (e.g. broken lamps, etc.);
- Accidents associated to braking or steering were on average 3 per year (< 1.5%);
- Other technical items were irrelevant from a statistical point of view.

Germany: According to data on traffic accidents from the Federal Statistical Office of Germany, approximately 2,000 accidents with personal injury (fatalities as well as minor and serious injuries) occurred per year with drivers of agricultural tractors. [129]

Austria: Tractors and non-road mobile machinery are classified together in accident data[130]:

Vehicle Types	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Tractors and non-road mobile machinery – Number of accidents	149	143	125	156	131	109	154	146	179	133
Tractors and non-road mobile machinery – Number of fatal accidents	8	6	4	4	9	3	3	5	9	8

To **question 25 on problems created by divergences in national safety requirements for road circulation of non-road mobile machinery**, respondents answered as follows:

Problems	Number of responses (%)
Different requirements for circulation of non-road mobile machinery within EU border regions	58 (78%)
Additional administrative, logistics, translation and consulting costs for multiple approvals	55 (74%)
Longer time to place a new type of machine in the market as it needs national approval	54 (73%)
Additional manufacturing and design costs to comply with multiple requirements	51 (69%)
Regulatory charges (fees) for multiple approvals in each EU country	49 (66%)
Other problems	3 (4%)

[129] https://www.destatis.de/DE/Themen/Gesellschaft-Umwelt/Verkehrsunfaelle/Publikationen/Downloads-Verkehrsunfaelle/verkehrsunfaelle-jahr-2080700187004.pdf?__blob=publicationFile https://www.destatis.de/DE/Themen/Gesellschaft-Umwelt/Verkehrsunfaelle/Publikationen/Downloads-Verkehrsunfaelle/verkehrsunfaelle-jahr-2080700197004.pdf?__blob=publicationFile In both documents the relevant statistics related to tractors (Landwirtschaftlichen Zugmaschinen) can be found in p.87

[130] https://www.statistik.at/web_de/statistiken/energie_umwelt_innovation_mobilitaet/verkehr/strasse/unfaelle_mit_personenschaden/019874.html (in German)

To **question 26 on consequences created by divergences in national safety requirements for road circulation of non-road mobile machinery**, respondents answered as follows:

Consequences	**Number of responses (%)**
Additional burden for users when using machinery across intra-EU borders	51 (69%)
Time delay in the market introduction of new machines	50 (67%)
Higher product prices for users	48 (65%)
Some companies decide not to sell mobile machine in certain markets	47 (63%)
Less variety of mobile machines available on the market in your country	43 (58%)
Less innovation in the machine design	35 (47%)
Substandard road safety in certain EU countries	23 (31%)
Other problems	3 (4%)

Respondents provided the following additional explanations on problem drivers and consequences:

- Difficulties in obtaining and understanding national requirements;
- Difficulties in the cross-border use of machinery customers in border regions, users unable to obtain multiple registration for a product, distortion of competition for contractors in border regions;
- Major difficulties in marketing second-hand machinery in other EU countries, as vehicles registered in one country must be converted or the documentation modified, if they are sold in another country with different requirements;
- Different requirements create a diversity of variants, which has a negative impact on the required design and development time. It also leads to additional costs, such as increased storage and logistics costs due to the greater diversity of parts or increased training costs for production personnel;
- Multiple assessments by technical services are costly;
- Need to follow multiple national approvals and their developments and revisions;
- Diverging national road traffic regulations regarding for instance allowed weight, dimensions and speed, mandatory signalling, etc. makes it more difficult to have the same approval on all types of vehicles;
- Country specific product exports increase complexity for development, organisation, marketing opportunities, time to market. Burden even higher for small series of machines, often not worth the effort;
- Longer time to market, adding to the seasonality of some businesses (e.g. agricultural machinery) where new machines must be launched in certain periods of the year, before the season starts;
- Distortion of competition and market barriers. If the effort to meet the specific requirements in one market is too high in relation to the expected number of machines sold, the machinery will not be offered on that market;
- Since development budgets are limited, multiple variants inevitably lead to time and cost constraints, some of which do not allow for innovation, creating a barrier to innovation. In addition, machines will be built in such a way that they

can be approved in as many countries as possible without major adjustments and the technically best solution might not then be implemented;

- SMEs in particular often lack the necessary resources (staff, specific knowledge of the rules) to carry out the necessary research themselves. Therefore, external consultants (law firms, engineering firms, technical services) are often required.
- Lack of harmonisation within the EU Member States can trigger different levels of safety requirements.

With regard to **question 31 on impacts of the COVID-19 pandemic,** respondents answered as follows:

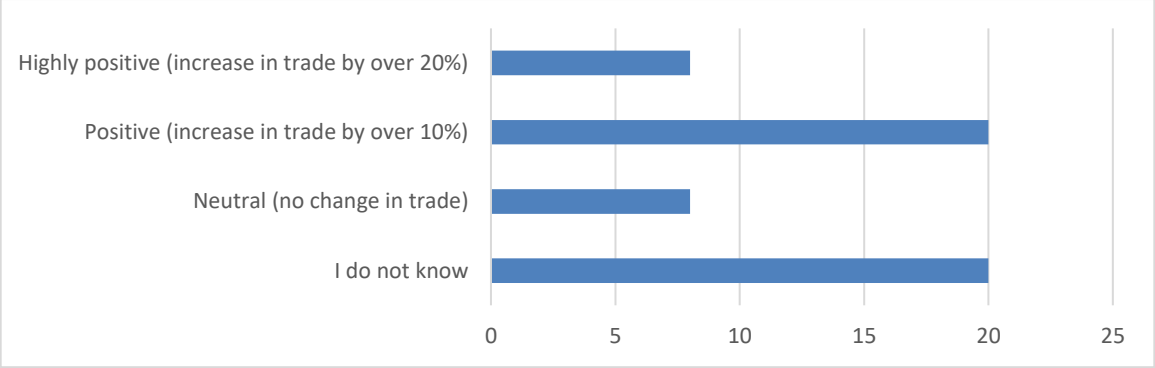
- **Manufacturers** reported high impacts, such as delayed or broken supply chains, borders between different countries closed at times, factory closures for several weeks during fist lockdown, reduction of production capacity, introduction of shift operations to reduce the number of employees per shift in order to reduce contacts, lack of sales and demonstrations events, payment delays, decreased turnover and higher costs. Business delivering to municipalities saw budget and orders reduced for city cleaning, road maintenance and winter services due to reduced tax revenues, e.g. reduced trade tax revenues due to closed businesses, shops and restaurants and upcoming insolvencies, and are therefore purchasing less machinery and requesting fewer services in these areas.
- **Users** in agriculture and forestry reported impacts, such as the security of supply for any necessary products (diesel, plant protection products, seeds, etc.).
- **Industry Associations** reported limited impacts, such as need to use virtual formats only partially suited to certain topics and tasks, and the lack of social contacts over a long period made difficult to communicate with members and contact persons.
- **Approval authorities and technical services** had to reduce staff capacity due to the hygiene rules imposed by the coronavirus outbreak, inspectors were not allowed to travel and on-the-spot checks were difficult or impossible, delaying the testing and certification of machinery;

➢ **Questions 32 to 50 aimed at gathering feedback on possible solutions to the problems this initiative aims to address.**

To **question 32 on the need for an EU-wide initiative** to harmonise the currently diverging national requirements for road circulation of non-road mobile machinery, **90% of respondents replied that there is a need for such initiative**. Respondents gave the following reasons:

Reasons	**Number of responses (%)**
Easier to sell machines in other EU countries for manufacturers	54 (73%)
Users can easily use machinery across intra-EU borders	54 (73%)
Faster approval procedures for manufacturers	51 (69%)
Lower costs for manufacturers	48 (65%)
Lower product prices for users	41 (55%)
Increased safety	38 (51%)

To **question 38 on the impact of EU harmonised legislation on non-road mobile machinery related to road circulation on cross-border trade opportunities within the EU**, businesses answered as follows:



The policy options considered in the questionnaire were the following:

1. EU approval of the whole mobile machine granted by Member States authorities. National Authorities approve the whole mobile machine for road circulation. There are two alternatives:

- *1.a) Type-approval The EU legal text includes all technical specifications for all parts of the mobile machine.*
- *1.b) Hybrid approach For parts of the mobile machine that are more critical for road safety (e.g. braking, steering), the EU legal text includes all technical specifications; For parts of the mobile machine that are less critical for road safety (e.g. cabin heating, mirrors, wheel guards, registration plate), the EU legal text includes only the basic requirements, while the detailed technical specifications are described in harmonised standards.*

2. CE marking of the whole mobile machine granted by the manufacturer. The manufacturer declares that the mobile machine meets all legal requirements. There is no need for national authorities to approve the mobile machine for road circulation. For the whole machine and for all parts, the EU legal text includes only the basic requirements, while the detailed technical specifications are described in harmonised standards.

To **question 45 on the policy option that best achieves the objective of having an EU-wide road approval system for non-road mobile machinery**, 61% (n=45) of respondents answered policy option 1.b., 18% (n=13) answered policy option 2 and 14% (n=10) answered policy option 1.a.

Most respondents found that policy option 2 would be too lenient and it would be impossible to monitor what the manufacturer will comply with, policy option 1a could increase costs unnecessarily, and policy option 1b would be the best compromise for safety, cost and enforcement.

The views by stakeholders' group were as follows:

- Respondents from manufacturers, distributors, and users' associations preferred option 1b.
- Respondents from EU authorities identified policy options 1.a or 1.b as the most effective.
- Respondents from and technical services preferred option 1a.

Annex 3: Who is affected and how?

1. PRACTICAL IMPLICATIONS OF THE INITIATIVE

A harmonised simplified type-approval legislation for road circulation will have the following implications for the stakeholders involved:

- Manufacturers and distributors:
  - will have an easier market entry and will eliminate delays linked to multiple EU countries' approvals;
  - will benefit from a reduction by a fifth of the compliance costs;
  - will benefit from the balanced combination of third party approval for critical vehicle features and self-certification for less critical vehicle features, hence keeping compliance costs under reasonable limits;
  - will enhance their competitiveness in and outside the EU.

- Rental companies and end users:
  - will benefit from a reduction by a fifth of the compliance costs;
  - will easily use and re-sell machinery across intra-EU borders;
  - will have more choice of non-road mobile machinery;
  - will have access to more innovative designs.

- Member States authorities:
  - will need to adapt to the new systems, however this is not seen as a problem or a significant burden by the affected authorities.

- Technical services:
  - will need to adapt to the new system, and will see an increase on workload and revenue, although this may be mitigated by the fact that approvals will likely decrease in number since manufacturers will have to undergo them in one EU country only.

- Road users:
  - Road users: will benefit from harmonised rules that ensure high road safety across the EU.

Is the most coherent option, since it is similar to the existing type-approval legislation for comparable vehicle categories.

2. SUMMARY OF COSTS AND BENEFITS

The costs and benefits have been calculated based on the estimations made in Table 5 for policy option 1b, corrected by removing the 4% (optional policy), 20% (towed equipment) and 10% (maximum design speed of 40 km/h).

I. Overview of Benefits (total for all provisions) – Preferred Option		
Description	***Amount***	***Comments***
Direct and indirect benefits		

Compliance cost reductions	€748 * (100-20%-10)% * (100-4)% = €502 million over 10 years, of which: €134 * (100-20%-10)% * (100-4)% = €90 million over 10 years €512 * (100-20%-10)% * (100-4)% = €344 million over 10 years, of which: €344*18% = €62 million over 10 years **Total: €846 million** **Total for SMEs: €152 million** over 10 years	For manufacturers and distributors For manufacturing and distributing SMEs For rental companies and end users For rental companies and end users SMEs[131]
One-in, one-out	Total benefit of the initiative is: €846 million over 10 years, i.e., €84,6 million per year, Since the administrative cost is estimated at 4% of the total, the overall **administrative saving** is calculated as **€3,38 million per year**.	For companies (manufacturers, distributors, rental companies and end users)
Competitiveness	Not quantifiable	
Internal Market	Not quantifiable	
Road Safety	Not quantifiable	

II. Overview of costs – Preferred option							
		Citizens/Consumers		Businesses		Administrations	
		One-off	Recurrent	One-off	Recurrent	One-off	Recurrent
Action (a)	Direct costs	Compliance costs offset by much higher savings. Net saving reported in previous table.				Not significant	Not significant
	Indirect costs	Compliance costs offset by much higher savings. Net saving reported in previous table				Not significant	Not significant

[131] The costs and benefits study considered the benefits for the SMEs belonging to the manufacturers and distributors group. Rental companies and end users include also many SMESs, therefore the overall economic benefit for SMEs is higher. To estimate this overall benefit, since the % of SMEs in the rental companies and end users market revenues is unknown, it has been considered the same percentage (18%) as for the manufacturers and distributors group, where SMEs account for 18% of the market revenues.

Annex 4: Analytical methods

The following categorisation of the non-road mobile machinery sector is based on non-road mobile machinery annual production values in the Eurostat statistics, and the related PRODCOM codes:[132]

PERIOD 2019	% of NRMM		EU27TOTALS_2019 (in Euro)		
PRCCODE/INDICATORS	Self-propelled	Towed	Self-propelled	IA towed	Total
28221433 - Mobile lifting frames on tyres and straddle carriers	20%		53.556.380	0	53.556.380
28221530 - Self-propelled works trucks fitted with lifting or handling equipment, non-powered by an electric motor	20%		662.061.198	0	662.061.198
28221570 - Works trucks, self-propelled, not fitted with lifting or handling equipment, of the type used in factories, warehouses, dock areas or airports for short distance transport of goods; tractors of the type used on railway station platforms	100%		550.000.000	0	550.000.000
28221850 - Loading machinery specially designed for agricultural use	100%		615.005.916	0	615.005.916
28303900 - Agricultural... forestry machinery, n.e.c.; lawn or sports-ground rollers	100%		1.373.247.935	0	1.373.247.935
28305340 - Straw or fodder balers, including pick-up balers		100%	0	819.329.843	819.329.843
28305420 - Potato-diggers and potato harvesters	50%		78.179.195	0	78.179.195
28305450 - Beet-topping machines and beet harvesters	50%		98.000.000	0	98.000.000
28305480 - Root or tuber harvesting machines (excluding potato-diggers and potato harvesters, beet-topping machines and beet harvesters)	50%		20.513.430	0	20.513.430
28305915 - Combine harvester-threshers	100%		1.635.848.589	0	1.635.848.589
28305930 - Agricultural threshing machinery (excluding combine harvester-threshers)	100%		76.881.002	0	76.881.002
28305945 - Forage harvesters (excluding self-propelled)		50%	0	26.099.059	26.099.059
28305960 - Forage harvesters, self-propelled	50%		235.704.532	0	235.704.532
28305970 - Harvesting machines (excluding combine harvester threshers, root or tuber harvesting machines, forage harvesters)	100%		750.806.116	0	750.806.116
28306050 - Sprayers and powder distributors designed to be mounted on or drawn by agricultural tractors (excluding watering appliances)		20%	0	142.152.444	142.152.444
28307040 - Self-loading or unloading trailers and semi-trailers for agriculture		100%	0	1.343.072.982	1.343.072.982
28308630 - Forestry machinery	100%		1.227.222.792	0	1.227.222.792
28922150 - Wheeled dozers (excluding track-laying)	100%		82.876.000	0	82.876.000
28922210 - Motor graders, levellers and scrapers	20%		16.000.000	0	16.000.000
28922310 - Ride-on compaction equipment and the like	20%		210.591.432	0	210.591.432
28922450 - Wheeled or crawler front-end shovel loaders (excl. specially designed for underground use)	20%		466.583.587	0	466.583.587
28922500 - Self-propelled mechanical shovels, excavators and shovel loaders, with a 360 degree revolving superstructure, except front-end shovel loaders	10%		500.000.000	0	500.000.000
28922630 - Self-propelled mechanical shovels, excavators and shovel loaders (excl. self-propelled mechanical shovels with a 360° revolving superstructure and front-end shovel loaders)		10%	0	111.020.509	111.020.509
28922650 - Self-propelled earth moving, excavating... machinery, n.e.c.	20%		40.553.410	0	40.553.410
28922810 - Dumpers for off-highway use	90%		934.399.672	0	934.399.672
28923030 - Snow-ploughs and snow-blowers	50%		74.717.407	0	74.717.407
29105950 - Concrete-mixer lorries	10%		40.000.000	0	40.000.000
29105990 - Other special-purpose motor vehicles n.e.c.	10%		290.524.634	0	290.524.634
28923090 - machinery for public works, building..., having individual functions	100%		2.116.201	0	2.116.201
28304030 - Mowers for lawns, parks or sports grounds, powered non-electrically, with the cutting device rotating in a horizontal plane	50%		363.358	0	363.358
28304050 - Motor mowers for lawns, parks or sports grounds, powered non-electrically, with the cutting device rotating in a vertical plane or with cutter bars	50%		244.000	0	244.000
TOTAL			**10.035.996.787**	**2.441.674.836**	**12.477.671.623**
% of TOTAL			**80%**	**20%**	**100%**

Source: 2019 Sold production, exports and imports by PRODCOM list (NACE Rev. 2) - annual data [DS-066341] (n.e.c.: not elsewhere classified, n.e.s: not elsewhere specified)

[132] The % of machinery under these codes that is non-road mobile machinery was agreed with stakeholders during the "Study on the EU harmonisation of the requirements for the road circulation of mobile machinery". ECORYS, 2016.

Annex 5: Vehicle features

Here below are reported the vehicle features relevant for road safety when the non-road mobile machinery is circulating on the public roads, to be included in the new legislation, as per discussions held in several workshops organised with all involved stakeholders:

1.Vehicle structure integrity

2. Maximum design speed, speed governor and speed limitation devices and speedometer

3. Braking devices

4. Steering

5. Field of vision

6. Windscreen wipers

7. Glazing and installation

8. Indirect vision devices

9. Lighting and lighting installation

10. Vehicle exterior and accessories in on road position, including working equipment and swinging structure

11. Audible warning devices and installation

12. Heating systems, defrost and demist

13. Registration plate spaces

14. Statutory plate and marking

15. Dimensions

16. Masses, including maximum on-road laden mass

17. Fuel tanks

18. Tyres

19. Reverse gear

20. Tracks

21. Mechanical couplings

22. Driver and other occupants' seating positions and restrain systems

23. Operator's manual for road use

24. Operator's controls for on-road use

25. On road information, warnings and markings

26. Other subjects

27. Sound level (external)