Supporting study for an evaluation and impact assessment of Directive 2000/14/EC on noise emission by outdoor equipment

Evaluation Final Report

Written by: VVA Economics & Policy, Joint Institute for Innovation Policy (JIIP), TNO, Global Data Collection Company (GDCC), and Technopolis group

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ABSTRACT

The objective of this study is to analyse the performance of the Outdoor Noise Emission Directive 2000/14/EC through its evaluation and impact assessment and to examine to what extent it has met its strategic objectives.

The study builds on a significant existing evidence base, as well as primary data collection undertaken via semi-structured interviews, an online survey with Market Surveillance Authorities and Notified Bodies, a company phone survey, and an Open Public Consultation.

The evaluation results show that the Directive has had a positive impact on noise emissions in the EU, being the main driver of noise reduction for the covered equipment. However, noise levels may still be high enough to have negative impacts on citizens' well-being.

The Directive has also prevented the emergence of different national regulations that would have hindered the intra-EU circulation of equipment in its scope. While the EU noise limits are stricter than limits in many third countries, there is no significant identifiable impact on extra-EU trade.

The level playing field is negatively impacted by insufficient market surveillance, which puts compliant manufacturers at a disadvantaged position against their non-compliant competitors.

Overall, the OND proved to be pivotal in the protection of the health and well-being of EU citizens although its application over the year highlighted a few shortcomings.

RÉSUMÉ

La présente étude a pour objet d'analyser les résultats de la directive 2000/14/CE relative aux émissions sonores dans l'environnement des matériels destinés à être utilisés à l'extérieur des bâtiments, par le biais de son évaluation et de l'étude de son impact, ainsi que d'examiner dans quelle mesure elle a atteint ses objectifs stratégiques.

L'étude se fonde sur une base de connaissances existantes importante, ainsi que sur la collecte de données primaires réalisée par le biais d'entretiens semi-structurés, une enquête en ligne auprès des autorités de surveillance du marché et des organismes notifiés, une enquête téléphonique auprès des entreprises, et une consultation publique ouverte.

Les résultats de l'évaluation mettent en évidence que la directive a eu un impact positif sur les émissions sonores dans l'UE, et constitue le vecteur principal de la réduction du bruit concernant les matériels couverts par la directive. Néanmoins, les niveaux sonores pourraient demeurer suffisamment élevés pour avoir des effets négatifs sur le bien-être des citoyens.

La directive a également évité l'émergence de réglementations nationales diverses qui auraient entravé la circulation au sein de l'UE des matériels auxquels elle s'applique. Bien que les limites d'émission sonores de l'UE soient plus strictes que celles en vigueur dans de nombreux pays tiers, on n'a constaté aucun impact significatif identifiable sur les échanges commerciaux extérieurs à l'UE.

Les conditions de concurrence équitables sont affectées négativement par une surveillance insuffisante du marché, ce qui place les fabricants respectueux de la réglementation dans une position défavorable par rapport à leurs concurrents en infraction.

Dans l'ensemble, la directive relative aux émissions sonores dans l'environnement s'est avérée déterminante pour la protection de la santé et du bien-être des citoyens de l'UE, bien que son application au cours de l'année ait mis en évidence quelques insuffisances.

EXECUTIVE SUMMARY

Valdani Vicari Associati (VVA) together with Joint Institute for Innovation Policy (JIIP), TNO and the Global Data Collection Company (GDCC) (hereinafter "the study team") have been mandated by the European Commission, Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs to carry out a Supporting Study on the Evaluation and Impact Assessment of Directive 2000/14/EC on Noise Emission by Outdoor Equipment (No 529/PP/GRO/IMA/16/1133/9044).

Introduction

The Outdoor Noise Directive (OND) establishes specific technical requirements (noise limits) for 22 equipment types and labelling obligation for other 35 equipment types in the following sectors:

- Cleaning equipment
- Construction equipment
- Gardening equipment
- Loading and lifting equipment
- Power generators and cooling equipment
- Pumping and suction equipment
- Snowmobiles and snow groomers
- Waste collection, processing and recycling.

The OND was adopted on 8 May 2000, and it has been applicable since 3 January 2002. Its two main objectives are:

- Ensuring a high degree of **protection for the health and well-being of citizens and the environment**;
- Ensuring **free circulation in the internal market** for equipment in the scope.

The rationale behind the revision of the OND was to:

- Respond to the technological development of equipment covered;
- Address limitations and shortcomings that the application of the Directive highlighted over the years;
- Ensure constant and adequate protection of the citizens' well-being and health.

As per Article 2(1), the Directive applies to the equipment listed in Articles 12 (subject to noise limits and label) and 13 (subject to noise label only) and defined in Annex I (the types of equipment are described in Chapter 5).

The evaluation

The aim of this study is to analyse the performance of the Outdoor Noise Emission Directive 2000/14/EC through its evaluation and impact assessment and to examine to what extent it has met its strategic objectives.

The evaluation is part of a study that will also provide a prospective analysis (impact assessment) examining whether it will be appropriate to propose a revision of the OND within the mandate of this Commission. The evaluation is carried out in line with the Better Regulation Guidelines.

Specifically, it shall evaluate the relevance, effectiveness, efficiency (with focus on the cost-benefit analysis), coherence and EU added value of the OND.

The evaluation builds on a significant amount of existing information, including several studies undertaken in recent years on different aspects of the performance of the OND. This evidence base constitutes an important part of the basis for the evaluation. In addition, primary data collection was undertaken to supplement the already existing evidence:

- **Semi-structured interviews** with stakeholders at EU and national levels (industry associations, consumer and environmental organisations, technical bodies and public authorities). A total of 32 in-depth interviews were carried out.
- An **online survey** targeting Market Surveillance Authorities and Notified Bodies in all Member States. Overall, the survey gathered 45 answers, from 20 different EU countries and 4 non-EU countries:
    - 11 from Market Surveillance Authorities; and
    - 34 from Notified Bodies.
- A **company phone survey** with individual companies manufacturing or renting equipment covered by the OND established in 10 Member States (Austria, Belgium, France, Germany, Ireland, Italy, Netherlands, Poland, Spain, and Sweden). 441 manufacturing companies and 98 rental companies participated in the survey, including 370 small and micro-enterprises.
- An **Open Public Consultation** on the OND and its revision. 232 stakeholders (129 individuals, 103 organisations) responded during the consultation period 23 January 2018 - 18 April 2018.
- **Participation to the Committee Working Group** under the Noise Emission by Outdoor Equipment Directive 2000/14/EC. The meeting, organised by the European Commission, provided additional input from a wide range of stakeholders attending the meeting (sector organisations, MSA, NB, and national public authorities).

Effectiveness

Did the Directive protect the health and well-being of citizens and the environment, by reducing permissible noise levels of such equipment?

Noise emission levels of outdoor equipment have dropped over the last 20 years, and it is estimated that for equipment under Article 12 this reduction is between 2 and 6 dB.

Despite this achievement, **most of the equipment covered by the OND, either by Article 12 or Article 13, are above a sound power level of 90 dB**. This means that bystanders at 25 metres of distance could be exposed to noise above 50 dB sound pressure level, which has potential impacts on their well-being.

Consumer behaviour also impacted the capacity of the OND to reach its objectives. A proactive attitude and more awareness could have led consumers to prefer quieter equipment pushing the market to dismiss more noisy versions. **The OND provisions on their own proved insufficient to motivate consumers to buy less noisy equipment**. Non-professional purchasers and users of the equipment under the scope of the Directive still lack knowledge and awareness about noise emissions, and the noise label alone is not enough to drive consumer choice.

Given the low market demand for quieter equipment, **in the absence of the OND, manufacturers would direct R&D investment towards those product characteristics that are more attractive to customers** (e.g. performance, safety, energy efficiency). Technological developments would have driven improvements in noise emissions even without the Directive, this is the case, for example, of the electric engines. The Directive, however, forced manufacturers to invest resources in the research and development of special designs, mechanisms and strategies to reduce noise emissions of outdoor equipment under Article 12. Mostly due to the insufficiency of the label to steer purchasing behaviour, the inclusion of equipment under Article 13 was not sufficient to encourage manufacturers to develop less noisy products to the same degree.

Finally, **shortcomings in market surveillance, mostly dependent on the lack of sufficient resources allocated to this specific area, also undermined the ability of the OND to protect the well-being of citizens**.

Although the OND did not reach its full potential, citizens exposed to noise emission from outdoor equipment are still better off than how they would have been without the OND.

> *Did the Directive ensure an internal market for outdoor equipment, by preventing obstacles to the free movement of such equipment?*

Before the OND came into force, seven product Directives and two procedure Directives applied to several types of equipment. **The simplification applied by the OND which merged and replaced these Directives brought greater clarity to the concerned legislative framework and improved the activity of all stakeholders**.

The OND is credited for having prevented the emergence of different regulations at the national level that may have hindered the intra-EU circulation of covered equipment. While there is a general agreement that the OND allowed for better trading across borders inside the EU, trade data to assess the concrete impact is scarce.

Although the OND may have prevented the proliferation of national legislation, **gaps in market surveillance expose compliant manufacturers to unfair competition by their non-compliant peers, potentially undermining the level playing field**.

In terms of extra-EU trade, there is no indication of a decrease in imports from non-EU countries as a consequence of the EU's stricter noise limits. On the contrary, some EU producers have to adapt their products to better match the preferences of non-EU customers by changing the design, increasing the power and even removing noise reduction elements from the products to reduce weight and increase power.

Covering many different types of equipment and versions of the same type, the classification and grouping of products currently applied might cause difficulties for manufacturers in understanding whether a product is actually covered by the Directive.

The three conformity assessment procedures foreseen by the OND address the different needs of the manufacturers well, although the lack of a possibility of self-declaration for equipment under Article 12 is seen as a constraint by some and as a guarantee by others. Notified Bodies that are competent to perform the requested procedures are not established in some countries,

which represents a barrier for manufacturers that have to seek the needed expertise in the other Member States.

The current test codes and measurement methods for the majority of the equipment covered by the OND are not in line with technological development and would need to be revised.

The lack of a clear and uniform procedure to determine the uncertainty of measurements in the OND may cause inconsistency between guaranteed power levels depending on the subject performing the measurement.

Efficiency

Was the Directive implemented efficiently?

Among the benefits brought by the OND, the health and environmental benefits are the most obvious and significant. **The monetised benefits total at EUR 1463 million for the period 2000-2017, or on average EUR 86.1 million per year.** Depending on uncertainties in the input variables, the monetised benefits can vary between around EUR 775 million and EUR 3804 million.

The benefits from trade are more difficult to calculate, due to the large number of influences on the sector over the past 17 years. While the stakeholders observe the positive impact of ensuring harmonised regulation within the EU and express some concern over the effect of stricter noise limits inside than outside the EU, they do not perceive significant impact on their business in terms of internal or external trade. Increased noise performance is also commonly not reflected in the final price of the product, which means that **the costs of the Directive are largely borne by the manufacturers, while the environmental benefits are enjoyed by the citizens in general**.

The conformity assessment costs are identified as one of the most significant costs to the manufacturers. On average, manufacturers conduct six tests per equipment type, the annual cost range is **EUR 8 million to EUR 10 million for equipment under Article 12 and EUR 10 million to EUR 17 million for equipment under Article 13, totalling EUR 18 million to EUR 27 million**.

The conformity costs are increased for companies that have to test separately for both OND and other Directives, most commonly the Machinery Directive. **Harmonising the assessment method between these two Directives** was seen as a potential simplification opportunity. Another such opportunity, favoured by many of the industry associations, would be **to switch to self-certification also for Article 12 products**. However, many other stakeholders consider that this would endanger both market safety and the level playing field. The level playing field is already considered threatened by the insufficiencies in market surveillance and enforcement, and many stakeholders see the third-party conformity assessment as an additional measure for ensuring compliance on the market, and consequently the benefit of investing in compliance for the companies. Similarly, switching to a self-declaration-based system would represent a trade-off between compliance costs and protection of citizens. Therefore, a balance must be found between simplification and ensuring compliance.

The NOISE database, while not particularly costly in terms of monetary spending, is considered burdensome due to both cumbersome input and not entirely reliable output. **Improving the database** could thus be seen as another opportunity for simplification.

Research and development is another expensive element of the Directive, with the estimated annual costs of approximately **EUR 40 million to EUR 120 million**. However, it should be noted that while undoubtedly a consequence of the Directive, increased R&D cost should not be seen as a purely negative element, due to the technological benefits gained.

Relevance

Was the Directive relevant to the needs of the users and the environment? Is it relevant to the needs of the users and the environment?

When the OND came into force, it filled an existing gap concerning the protection of citizens exposed to noise emissions produced by outdoor equipment operated by other users, private or professional.

It is estimated that for equipment under Article 12, the OND produced a reduction in noise emission between 2 and 6 dB. Considering that the sound power levels established by the OND are still above the threshold marked as safe for health and well-being, it is clear that at the time the Directive came into force, noise emissions were even more harmful to EU citizens.

About seventeen years after the introduction of the OND, **the growing urbanisation and the subsequent increase in construction of road and building infrastructures has led to the use of more outdoor equipment and therefore also increased noise production**. Both stock numbers and work automation have increased. Especially consumer equipment has undergone a massive increase in numbers thanks to low-cost products available on the internet and in supermarkets. This increase in the number of equipment on the market and in use has had a counterbalancing impact on the positive effect of the Directive in reducing noise emission levels, renewing the need for pressure on the manufacturers to produce less noisy equipment. Such pressure could come from two sources: the market or the legislation. In the absence of market demand for quieter equipment, it is still up to the legislator to set limits to noise emissions for the outdoor equipment safeguarding well-being and health of citizens.

The low market demand for quieter equipment highlights the emergence of a new need to address. **There is a general lack of awareness from customers about noise emission and their impact on health and well-being that is not currently targeted by the Directive**.

Was the Directive relevant to the needs of the industry? Is it still relevant to the needs of the industry?

With regards to the needs of the industry, while **the OND addressed the need for harmonisation and legal certainty across the EU**, from an international trade perspective, the Directive and the stricter limits imposed did not bring advantages nor helped to comply with foreign legislation.

Almost none of the stakeholders would be in favour of repealing the Directive, seeing the potential risk of the development of multiple national standards.

An aspect that is considered not in line with the current needs of the industry is the third-party conformity assessment. When the OND came into force companies were missing the specific knowledge required to measure noise emissions, and the task of performing the conformity assessment was entrusted to the Notified Bodies (NBs).

Today, many manufacturers have the skills to perform the measurements themselves and could rely on a self-certification instead of the third-party conformity assessment.

Coherence

Internal coherence: Is the Directive coherent with other EU legislation?

In terms of internal coherence and complementarity, some conflicts were identified for manufacturers, stemming from **differing requirements with other legislative acts** applying to the same machinery. The differences in requirements with the Machinery Directive mean that some equipment must be tested twice, while the requirements of the Non-Road Mobile Machinery Regulation on emissions make it difficult for some equipment to comply with both. Both of these issues were already identified in the NOMEVAL study of 2007, although the NRMM Directive has since been converted to the NRMM Regulation. As also identified in the NOMEVAL study, **the lack of uncertainty measurement** in the Directive leaves a variability of guaranteed power levels, depending on the subject performing the measurement.

The OND is a coherent part of a wider, comprehensive network of environmental noise legislation in the EU, and additionally, it complements health and safety legislation by providing noise limits and information. **No conflicts were identified** within these frameworks.

As discussed in the previous sections, **insufficient market surveillance means** that non-compliant equipment may still enter the market and the level playing field is not guaranteed.

External coherence: Is the Directive coherent with non-EU legislation (national or international)?

In terms of external coherence and complementarity, **no major difficulties were identified** in regard to the relationship between the OND and extra-EU legislation. While in some instances the differences in noise limits inside and outside the EU can be seen as hindrances to trade, no particularly significant impacts were identified. In addition, some international limits are indeed influenced with the EU noise policy, as the close alignment of European noise emission regulations with international standard bodies, and the fact that each Member State has one vote in ISO and IEC working groups makes the EU a powerful influencer.

In certain Member States, the OND is supported by **voluntary national incentives** increasing awareness of noise levels and the value of producing and buying quieter equipment. Considering that the Directive's own incentive for consumers to buy quieter equipment is considered insufficient, this is an important abatement.

EU Added Value

Would have the same results in relation to the strategic objectives been possible without the EU intervention?

Despite the limitations of the OND, **the Directive achieved a few key results that would not have happened without it.**

The Directive prevented the proliferation of different national regulations, and there is the perception that without it new national regulations might emerge.

Due to the Directive's requirements, noise levels decreased in the past twenty years despite the lack of market demand and the additional costs that had to be borne by companies.

Would the results achieved remain if the Directive was withdrawn?

Even though current limits may not be in line with state of the art, the Directive still obliges manufacturers to balance the research on higher performance equipment with the OND requirement regarding noise emissions. **Without the Directive, given the absence of market pressure by consumers, it is likely that producers of outdoor equipment would neglect this aspect in favour of other features**.

For all these reasons, none of the stakeholders consulted was in favour of repealing the OND.

RÉSUMÉ ANALYTIQUE

Valdani Vicari Associati (VVA), Joint Institute for Innovation Policy (JIIP), TNO et Global Data Collection Company (GDCC) (ci-après, « l'équipe chargée de l'étude ») ont été mandatés par la Commission européenne, Direction générale du marché intérieur, de l'industrie, de l'entrepreneuriat et des PME, pour réaliser une Étude justificative concernant l'évaluation et l'étude d'impact de la directive 2000/14/CE relative aux émissions sonores dans l'environnement des matériels destinés à être utilisés à l'extérieur des bâtiments (n° 529/PP/GRO/IMA/16/1133/9044).

Introduction

La directive relative aux émissions sonores dans l'environnement des matériels destinés à être utilisés à l'extérieur des bâtiments prévoit des exigences techniques spécifiques (limites d'émission sonore) pour 22 types de matériels et une obligation de marquage pour 35 types additionnels de matériels des secteurs suivants :

- Matériel de nettoyage
- Matériel de construction
- Matériel de jardinage
- Matériel de charge et élévateur
- Groupes électrogènes et matériel de refroidissement
- Matériel de pompage et d'aspiration
- Motoneiges et dameuses
- Matériel de collecte, de traitement et de recyclage des déchets

La directive relative aux émissions sonores dans l'environnement des matériels destinés à être utilisés à l'extérieur des bâtiments a été adoptée le 8 mai 2000, et elle est en vigueur depuis le 3 janvier 2002. Elle vise principalement les deux objectifs suivants :

- garantir un niveau élevé de **protection de la santé et du bien-être des personnes et de l'environnement** ;
- Garantir la **libre circulation au sein du marché intérieur** des matériels auxquels elle s'applique.

Les raisons qui motivent la révision de la présente directive sont les suivantes :
- la volonté de tenir compte du développement technique des matériels concernés ;
- la volonté de parer aux limitations et aux insuffisances mises en lumière par l'application de la directive au fil des années ;
- la volonté de garantir une protection constante et appropriée du bien-être et de la santé des personnes.

Au sens de son article 2, paragraphe 1, la directive s'applique aux matériels destinés à être utilisés à l'extérieur des bâtiments, qui sont énumérés aux articles 12 (matériels soumis à des limites d'émission sonore et au marquage du niveau sonore) et 13 (matériels soumis au marquage uniquement) et définis à l'annexe I (les types de matériels sont décrits au chapitre 5).

L'évaluation

La présente étude a pour objet d'analyser les résultats de la directive 2000/14/CE relative aux émissions sonores dans l'environnement des matériels destinés à être utilisés à l'extérieur des bâtiments par le biais de son évaluation et de l'étude de son

impact, ainsi que d'examiner dans quelle mesure elle a atteint ses objectifs stratégiques.

L'évaluation s'inscrit dans le contexte d'une étude qui fournira également une analyse prospective (étude d'impact) examinant la question de savoir s'il conviendrait de proposer une révision de la directive dans le cadre du mandat de cette Commission. L'évaluation est menée conformément aux dispositions des Lignes directrices pour une meilleure réglementation.

Plus concrètement, elle évaluera la pertinence, l'efficacité, l'efficience (mettant l'accent sur l'analyse de rentabilité), la cohérence et la valeur ajoutée européenne de la directive.

L'évaluation s'appuie sur un nombre significatif d'informations existantes, dont plusieurs études menées récemment concernant différents aspects des résultats de la directive. La base de connaissances constitue une partie importante des éléments sur lesquels se fonde l'évaluation. En outre, une collecte de données primaires a été réalisée, afin de compléter les éléments factuels déjà existants :

- **des entretiens semi-structurés** avec des parties prenantes aux niveaux de l'UE et nationaux (associations du secteur, organisations de consommateurs et environnementales, organismes techniques et autorités publiques). Au total, 32 entretiens approfondis ont été réalisés ;
- une **enquête en ligne** ciblant les autorités de surveillance du marché et les organismes notifiés de tous les États membres. Dans l'ensemble, l'enquête a permis de rassembler 45 réponses en provenance de 20 États membres différents de l'UE et de 4 pays non membres de cette dernière :
    - 11 répondants étaient des autorités de surveillance du marché et
    - 34 répondants étaient des organismes notifiés ;
- une **enquête téléphonique** auprès d'entreprises individuelles qui fabriquent ou louent des matériels couverts par la directive, établies dans 10 États membres (l'Autriche, la Belgique, la France, l'Allemagne, l'Irlande, l'Italie, les Pays-Bas, la Pologne, l'Espagne et la Suède). 441 entreprises de production et 98 sociétés de location ont participé à l'enquête, dont 370 petites et micro entreprises ;
- une **Consultation publique ouverte** concernant la directive et sa révision. 232 parties prenantes (129 personnes physiques et 103 personnes morales) ont répondu lors de la période de consultation (du 23 janvier 2018 au 18 avril 2018) ;
- la **participation au Groupe de travail du Comité** constitué dans le cadre de la directive 2000/14/CE relative aux émissions sonores dans l'environnement des matériels destinés à être utilisés à l'extérieur des bâtiments. La réunion, organisée par la Commission européenne, a permis de prendre note des commentaires d'un large éventail de parties prenantes du secteur (organisations sectorielles, autorités de surveillance du marché, organismes notifiés et autorités publiques nationales).

Efficacité

La directive a-t-elle protégé la santé et le bien-être des personnes et l'environnement en réduisant les niveaux d'émission sonore admissibles des matériels en cause ?

Les niveaux d'émission sonore des matériels destinés à être utilisés à l'extérieur des bâtiments ont chuté au cours des 20 dernières années, et on estime que pour les matériels cités sous l'article 12, ladite réduction se situe entre 2 et 6 décibels.

En dépit de ce succès, **la plupart des matériels couverts par la directive, qu'ils relèvent de l'article 12 ou de l'article 13, dépassent un niveau de puissance acoustique de 90 décibels**. Ceci signifie que des passants se trouvant à 25 mètres de distance peuvent se voir exposés à un niveau de pression acoustique de plus de 50 décibels, avec les impacts potentiels sur leur bien-être qui en découlent.

Le comportement des consommateurs a aussi eu des répercussions sur la capacité de la directive à atteindre ses objectifs. Une attitude proactive et une sensibilisation accrue pourraient avoir amené les consommateurs à préférer des matériels plus silencieux, poussant ainsi le marché à écarter les versions plus bruyantes. **Les dispositions de la directive en elles-mêmes se sont avérées insuffisantes pour inciter les consommateurs à acheter des matériels moins bruyants.** Les acheteurs non professionnels et les utilisateurs des matériels soumis à la directive manquent encore de connaissances et de sensibilisation concernant les émissions sonores, et l'indication du niveau sonore à elle seule ne suffit pas à déterminer le choix du consommateur.

Au vu de la faible demande du marché pour des matériels plus silencieux, **si la directive n'existait pas, les fabricants orienteraient leurs investissements en R&D vers les caractéristiques des produits les plus attirantes pour les clients** (par exemple la performance, la sécurité, et l'efficacité énergétique). Les développements technologiques auraient apporté des améliorations aux émissions sonores même si la directive n'avait pas été adoptée. Il en est ainsi, par exemple, dans le cas des moteurs électriques. Néanmoins, la directive a forcé les fabricants à investir des ressources dans la recherche et le développement de conceptions, stratégies et mécanismes spéciaux pour réduire les émissions sonores des matériels destinés à être utilisés à l'extérieur des bâtiments relevant de l'article 12. Principalement en raison de l'insuffisance du label pour déterminer les comportements d'achat, l'inclusion des équipements cités sous l'article 13 n'a pas suffi à encourager les fabricants à développer des produits moins bruyants dans une mesure équivalente.

Enfin, **les insuffisances dans la surveillance du marché, motivées principalement par le manque de ressources suffisantes allouées à ce domaine particulier, ont sapé, elles aussi, la capacité de la directive à protéger le bien-être des personnes**.

Bien que la directive n'ait pas atteint pleinement son potentiel, les personnes exposées aux émissions sonores des matériels destinés à être utilisés à l'extérieur des bâtiments se trouvent néanmoins dans une meilleure situation que celle qui aurait été la leur si la directive n'avait pas été adoptée.

> *Est-ce que la directive a garanti un marché intérieur aux matériels destinés à être utilisés à l'extérieur des bâtiments, en évitant les obstacles à la libre circulation desdits matériels ?*

Avant l'entrée en vigueur de la directive, sept directives relatives aux produits et deux directives de procédure s'appliquaient à divers types de matériels. **La simplification mise en œuvre par la directive 2000/14/CE, qui a fusionné et remplacé les**

directives précédentes, a clarifié grandement le cadre législatif en cause, tout en améliorant l'activité de l'ensemble des parties prenantes.

C'est grâce à la directive 2000/14/CE que l'on a évité l'émergence de réglementations diverses sur le plan national, qui auraient pu entraver la libre circulation des matériels concernés au sein de l'UE. S'il existe un consensus général quant au fait que la directive a permis d'améliorer les échanges commerciaux transfrontaliers au sein de l'UE, les données concernant ces échanges et permettant d'évaluer l'impact concret sont rares.

Bien que la directive ait pu éviter la prolifération de législations nationales, **les lacunes dans la surveillance du marché exposent les fabricants respectueux de ses dispositions à des conditions de concurrence déloyale face à leurs pairs en infraction, ce qui sape potentiellement une concurrence équitable.**

En termes d'échanges commerciaux extérieurs à l'UE, rien n'indique une diminution des importations en provenance des pays hors UE en raison des limites sonores plus strictes en vigueur sur le territoire de cette dernière. Bien au contraire, certains fabricants de l'UE doivent adapter leurs produits pour mieux répondre aux préférences des clients extérieurs à l'UE, en modifiant la conception, en augmentant la puissance, voire même en supprimant les éléments de réduction des émissions sonores pour diminuer le poids et accroître la puissance.

Dans la mesure où elles couvrent de nombreux types de matériels différents et de versions du même type, la classification et le groupement des produits actuellement en vigueur pourraient avoir pour conséquence que les fabricants aient du mal à comprendre si un produit relève ou non de la directive.

Les trois procédures d'évaluation de la conformité prévues par la directive répondent bien aux besoins des fabricants, bien que l'absence de possibilité d'auto-déclaration concernant les matériels cités à l'article 12 soit perçue comme une contrainte par certains et comme une garantie par d'autres. Dans certains pays, les organismes notifiés compétents pour mettre en œuvre les procédures requises n'existent pas, ce qui constitue un obstacle pour les fabricants, qui doivent chercher l'expertise nécessaire dans les autres États membres.

Les codes d'essai et les méthodes de mesure actuellement disponibles pour la plupart des matériels soumis à la directive ne tiennent pas compte des développements technologiques et devraient être révisés.

L'absence d'une procédure claire et uniforme pour déterminer l'incertitude des mesures dans la directive pourrait entraîner un manque de cohérence entre les niveaux de puissance garantis, en fonction de la personne qui réalise la mesure.

Efficience

Est-ce que la directive a été appliquée de façon efficiente ?

Parmi les bienfaits apportés par la directive, la santé et les bénéfices environnementaux sont les plus évidents et significatifs. **Les bienfaits traduits en valeur monétaire s'élèvent à 1 463 millions EUR pour la période 2000-2017, soit une moyenne de 86,1 millions EUR par an.** En fonction des incertitudes parmi les variables d'entrée, la valeur monétaire des bienfaits peut varier entre environ 775 millions EUR et 3 804 millions EUR.

Les bénéfices tirés du commerce s'avèrent plus difficiles à calculer, en raison du nombre élevé de facteurs ayant influencé le secteur au cours de ces 17 dernières années. Bien que les parties prenantes observent l'impact positif d'une garantie de réglementation harmonisée au sein de l'UE, et expriment une certaine inquiétude concernant l'effet de limites sonores plus strictes sur le territoire de cette dernière qu'ailleurs, ils ne perçoivent pas un impact significatif sur leurs activités commerciales en termes d'échanges commerciaux internes ou externes. De même, l'augmentation des performances sonores n'est généralement pas reflétée dans le prix final du produit, ce qui implique que **les coûts dérivés de la directive sont largement supportés par les fabricants, alors que les bienfaits environnementaux profitent aux citoyens en général**.

Les frais liés à l'évaluation de la conformité sont identifiés comme faisant partie des frais les plus importants pour les fabricants. En moyenne, les fabricants réalisent six essais par type de matériel, la fourchette de coûts annuelle variant **entre 8 et 10 millions EUR par matériel relevant de l'article 12 de la directive, et entre 10 et 17 millions EUR par matériel relevant de l'article 13, soit un total entre 18 et 27 millions EUR**.

Les coûts de conformité sont encore plus élevés pour les entreprises qui doivent réaliser des essais séparés en fonction de la directive 2000/14/CE et d'autres directives, souvent la directive Machines. **L'harmonisation de la méthode d'évaluation entre ces deux directives** a été considérée comme une opportunité potentielle de simplification. Une autre opportunité, préférée par de nombreuses associations du secteur, consisterait à **adopter l'auto-certification également pour les produits relevant de l'article 12**. Néanmoins, de nombreuses autres parties prenantes considèrent qu'une telle mesure compromettrait aussi bien la sécurité du marché que la concurrence équitable. On estime d'ores et déjà que les conditions équitables de concurrence sont menacées par les insuffisances dans la surveillance du marché et dans l'application de la réglementation, et de nombreuses parties prenantes voient l'évaluation de la conformité effectuée par un tiers comme une mesure additionnelle permettant d'assurer la conformité sur le marché, et par conséquent l'avantage à investir dans la conformité pour les entreprises. D'une façon similaire, le passage à un système d'auto-déclaration pourrait représenter un compromis entre les coûts liés à la conformité et la protection des personnes. Aussi, un équilibre doit être trouvé entre la simplification et la garantie de la conformité.

La base de données NOISE, bien qu'elle ne s'avère pas particulièrement coûteuse en termes de dépense monétaire, est considérée comme une contrainte, en raison aussi bien du caractère fastidieux de la réalisation des contributions que du manque de fiabilité de ses productions. **L'amélioration de la base de données** pourrait donc être considérée comme une autre opportunité de simplification.

La recherche et le développement constituent un autre élément onéreux de la directive, avec un coût annuel estimé entre environ **40 et 120 millions EUR**. Il convient néanmoins de noter que bien qu'il s'agisse là, sans aucun doute, d'une conséquence de la directive, l'augmentation des frais de R&D ne devrait pas être considérée comme un élément purement négatif, au vu des bienfaits technologiques qui en découlent.

Pertinence

> *La directive s'est-elle avérée pertinente par rapport aux besoins des utilisateurs et à l'environnement ? Est-elle pertinente par rapport aux besoins des utilisateurs et à l'environnement ?*

Lorsqu'elle est entrée en vigueur, la directive est venue combler une lacune existante concernant la protection des personnes exposées aux émissions sonores dans l'environnement des matériels destinés à être utilisés à l'extérieur des bâtiments employés par d'autres utilisateurs, privés ou professionnels.

Il a été estimé que pour les matériels relevant de l'article 12, la directive a entraîné une réduction des émissions sonores d'entre 2 et 6 décibels. Sachant que les niveaux de puissance acoustique établis par la directive dépassent encore le seuil considéré comme sûr pour la santé et le bien-être, il est clair qu'au moment de l'entrée en vigueur de la directive, les émissions sonores étaient encore plus préjudiciables pour les citoyens de l'UE.

Environ dix-sept ans après l'introduction de la directive, **l'urbanisation croissante et l'augmentation consécutive de la construction d'infrastructures routières et d'immeubles a mené à l'emploi de plus de matériels destinés à être utilisés à l'extérieur des bâtiments et donc, également, à une augmentation de la production de bruit.** Aussi bien les nombres de stocks que l'automatisation du travail ont augmenté. En particulier, le matériel de consommation a fait l'objet d'une augmentation massive des unités, grâce aux produits à faible coût disponibles sur Internet et dans les supermarchés. L'augmentation du nombre de matériels présents sur le marché et de leur utilisation est venue contrebalancer l'effet positif de la directive pour ce qui est de la réduction des niveaux d'émission sonore, renouvelant ainsi la nécessité d'inciter les fabricants à produire des matériels moins bruyants. Une telle incitation pourrait provenir de deux sources : le marché ou la législation. En l'absence d'une demande sur le marché de matériels plus silencieux, il revient encore au législateur de définir des limites pour les émissions sonores en provenance des matériels destinés à être utilisés à l'extérieur des bâtiments, sauvegardant ainsi le bien-être et la santé des personnes.

La faible demande sur le marché de matériels plus silencieux souligne l'émergence d'une nouvelle nécessité dont il faut tenir compte. **Il existe un manque de sensibilisation général des consommateurs concernant les émissions sonores et leur impact sur la santé et le bien-être, qui n'est actuellement pas ciblé par la directive**.

> *La directive s'est-elle avérée pertinente par rapport aux besoins du secteur ? Est-elle toujours pertinente par rapport aux besoins du secteur ?*

Pour ce qui est des besoins du secteur, bien **qu'elle ait tenu compte de la nécessité d'harmonisation et de sécurité juridique à l'échelle de l'UE**, du point de vue du commerce international, la directive et les limites plus strictes que celle-ci impose n'ont pas constitué des avantages ou contribué au respect des législations étrangères.

Presque aucune des parties prenantes ne serait favorable à l'abrogation de la directive, face au risque potentiel d'adoption de normes nationales multiples.

Un aspect qui est considéré comme n'étant pas en phase avec les besoins actuels du secteur est l'évaluation de la conformité par un tiers. Lorsque la directive est entrée en vigueur, les entreprises ne disposaient pas des connaissances nécessaires pour mesurer les émissions sonores, de sorte que la réalisation des évaluations de conformité a été confiée aux organismes notifiés (ON). Á l'heure actuelle, les fabricants possèdent les compétences requises pour effectuer les mesures par eux-mêmes et pourraient donc avoir recours à l'auto-certification, au lieu d'évaluations de conformité réalisées par des tiers.

Cohérence

Cohérence interne : La directive est-elle cohérente avec les autres réglementations de l'UE ?

En termes de cohérence interne et de complémentarité, certains conflits ont été identifiés pour les fabricants, découlant des **exigences divergentes prévues par d'autres dispositions réglementaires** qui s'appliquent aux mêmes machines. Les différences concernant les exigences prévues par la directive Machines impliquent que certains matériels doivent être testés à deux reprises, alors que les exigences en matière d'émissions du règlement relatif aux engins mobiles non routiers ont pour conséquence que certains matériels ont du mal à se conformer aux deux réglementations. Ces deux difficultés avaient déjà été identifiées dans le cadre de l'étude NOMEVAL de 2007, bien que la directive EMNR ait été transformée depuis en règlement EMNR. Ainsi que cela avait été constaté également dans l'étude NOMEVAL, **le manque de mesure de l'incertitude** dans la directive 2000/14/CE entraîne une variabilité des niveaux de puissance garantis, en fonction de la personne qui réalise la mesure.

La directive 2000/14/CE constitue une partie cohérente d'un réseau exhaustif plus large de réglementation de l'UE en matière d'émissions sonores dans l'environnement, et elle vient compléter, en outre, la règlementation relative à la santé et à la sécurité, en prévoyant des limites sonores et en fournissant des informations. **Nul conflit n'a été identifié** au sein de ces cadres.

Ainsi que cela a été évoqué dans les sections précédentes, **une surveillance insuffisante du marché a pour conséquence** que des matériels non conformes pourraient malgré tout être introduits sur le marché, de sorte que les conditions d'une concurrence équitable ne sont pas garanties.

Cohérence externe : La directive est-elle cohérente par rapport à la réglementation extérieure à l'UE (nationale ou internationale) ?

En termes de cohérence externe et de complémentarité, **nulle difficulté majeure n'a été identifiée** concernant les rapports entre la directive 2000/14/CE et la réglementation extérieure à l'UE. Bien que, dans certains cas, les différences quant aux limites sonores à l'intérieur et à l'extérieur de l'UE puissent être considérées comme des entraves aux échanges commerciaux, nul impact particulièrement significatif n'a été identifié. En outre, certaines limites internationales sont bel et bien influencées par la politique d'émissions sonores de l'UE, ainsi qu'en témoigne l'alignement étroit entre la réglementation européenne en matière d'émissions sonores et les organismes de normalisation internationaux. Par ailleurs, le fait que chacun des États membres de l'UE dispose d'une voix dans les groupes de travail ISO et CEI vient accroître le pouvoir d'influence de l'UE en la matière.

Dans certains États membres, la directive 2000/14/CE jouit du soutien **d'incitations volontaires nationales**, qui viennent renforcer la sensibilisation aux niveaux sonores et l'intérêt de fabriquer et d'acheter des matériels plus silencieux. Sachant que l'incitation de la directive pour que les consommateurs achètent des matériels plus silencieux est considérée insuffisante, il s'agit là d'un élément important.

Valeur ajoutée de l'UE

Aurait-il été possible d'obtenir les mêmes résultats pour ce qui est des objectifs stratégiques sans l'intervention de l'UE ?

En dépit des limitations de la directive, **celle-ci a obtenu quelques résultats clés qui ne seraient pas intervenus si elle n'avait pas été adoptée.**

La directive a évité la prolifération de différentes réglementations nationales, et on considère que si la directive était abrogée, de nouvelles réglementations nationales pourraient émerger.

En raison des exigences de la directive, les niveaux sonores ont diminué au cours de ces vingt dernières années, malgré l'absence de demande sur le marché et les coûts additionnels que les entreprises ont eu à supporter.

Les résultats atteints perdureraient-ils si la directive était abrogée ?

Bien que les limites actuelles puissent ne pas être conformes à la pointe du progrès, la directive contraint néanmoins les fabricants à trouver un équilibre entre la recherche, pour obtenir des matériels aux performances accrues, et l'exigence de la directive en matière d'émissions sonores. **Si la directive était abrogée, et compte tenu de l'absence de pression sur le marché de la part des consommateurs, il semble fort probable que les fabricants de matériels destinés à être utilisés à l'extérieur des bâtiments négligeraient cet aspect au profit d'autres caractéristiques.**
Pour toutes ces raisons, aucune des parties prenantes ne s'est dite favorable à l'abrogation de la directive 2000/14/CE.

1. INTRODUCTION

This document contains the evaluation part of the Draft Final Report for the Evaluation and Impact assessment study in respect of revision of the Outdoor Noise Directive 2000/14/EC (OND).

The report is divided into seven main sections:

1. Introduction
2. Background to the initiative
3. Evaluation questions
4. Presentation of the Methodology
5. State of play
6. Answers to the evaluation questions
7. Conclusions

Furthermore, the document is accompanied by the following annexes:

I. Stakeholder consultation
II. Who is affected by the initiative and how
III. Methods and analytical models
IV. List of relevant Notified Bodies and Market Surveillance Authorities
V. References

2. BACKGROUND TO THE INITIATIVE

The European Union has made the reduction of noise pollution one of its priorities for safeguarding citizens' well-being and preserving the environment. Noise is identified as one of the most significant environmental problems in urban areas in the Fifth Environmental Action Programme[1].

Noise is also identified as one of the main local environmental problems in Europe and the source of an increasing number of public complaints in the Green Paper on Future Noise Policy[2]. The Green Paper announced the Commission's intention to simplify the existing legislation setting emission limits for outdoor equipment (see section 2.1) and to propose a Framework Directive to control noise emission by equipment for use outdoors. The Green Paper also notes that calls had been made by several Member States to extend the coverage of the legislation to other products, especially to ensure that emerging national legislation[3] on noise emissions would not lead to market barriers.

The Sixth Environmental Programme[4] lists reduction of noise pollution to acceptable levels as a priority objective, to be attained by, *inter alia*, revising and setting noise limits for different types of machinery and other products.

The Environmental Noise Directive 2002/49/EC[5] (END) is the primary EU legal instrument for identifying and addressing noise pollution. It provides a common framework for the Member States to assess unwanted and harmful noise and forms the basis for action plans to be established at the national level. The END is complemented by a range of legislation regulating environmental noise at the source. The environmental noise of equipment for outdoor use is legislated under Directive 2000/14/EC of the European Parliament and of the Council on the approximation of the law of the Member States relating to the noise emissions in the environment by equipment for use outdoors[6] (Outdoor Noise Emission Directive - OND).

2.1. Overview of the OND

Adopted on 8 May 2000, the OND has been applicable since 3 January 2002. Its two main objectives are:

- Ensuring a high degree of **protection for the health and well-being of citizens and the environment**;
- Ensuring **free circulation in the internal market** for equipment in the scope.

To achieve these objectives, the OND merged two Directives on test procedures and seven specific product Directives:

[1] Decision No 2179/98/EC of the European Parliament and of the Council of 24 September 1998 on the review of the European Community programme policy and action in relation to the environment and sustainable development "Towards sustainability". OJ C 138/5 http://ec.europa.eu/environment/archives/action-programme/env-act5/pdf/5eap.pdf.

[2] COM(96) 540 final, available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1528988929065&uri=CELEX:51996DC0540.

[3] At the time, France had set legislation to control the noise of construction machines, Germany to control concrete pumps ad mixers, and Netherlands to control motor chain saws.

[4] COM(2001) 31 final, available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1528991329998&uri=CELEX:52001DC0031.

[5] Directive 2002/49/EC of the European Parliament and of the Council of 25 June 2002 relating to the assessment and management of environmental noise. Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32002L0049.

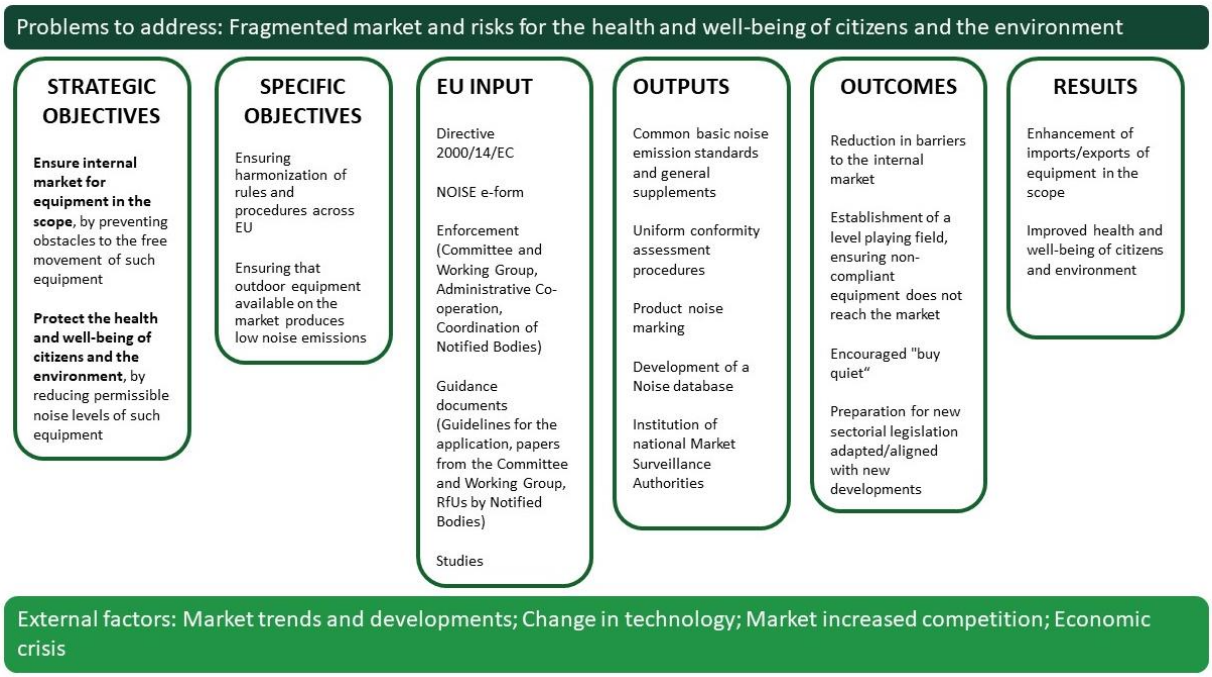
[6] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:02000L0014-20090420.

- Council Directive 79/113/EEC on the approximation of the laws of the Member States relating to the determination of the noise emission of construction plant and equipment;
- Council Directive 84/532/EEC on the approximation of the laws of the Member States relating to common provisions for construction plant and equipment;
- Council Directive 84/533/EEC on the approximation of the laws of the Member States relating to the permissible sound power level of compressors;
- Council Directive 84/534/EEC on the approximation of the laws of the Member States relating to the permissible sound power level of tower cranes;
- Council Directive 84/535/EEC on the approximation of the laws of the Member States relating to the permissible sound power level of welding generators;
- Council Directive 84/536/EEC on the approximation of the laws of the Member States relating to the permissible sound power level of power generators;
- Council Directive 84/537/EEC on the approximation of the laws of the Member States relating to the permissible sound power level of powered hand-held concrete-breakers and picks;
- Council Directive 84/538/EEC on the approximation of the laws of the Member States relating to the permissible sound power level of lawnmowers;
- Council Directive 86/662/EEC on the limitation of noise emitted by hydraulic excavators, rope-operated excavators, dozers, loaders and excavator-loaders.

As discussed above, it was considered important to simplify and extend this legislation, to make the control the noise emissions of equipment used outdoors more effective and to protect the internal market.

As per Article 2(1), the Directive applies to the equipment listed in Articles 12 (subject to noise limits and label) and 13 (subject to noise label only) and defined in Annex I (the types of equipment are described in Chapter 5).The intervention logic behind the OND is presented in Figure 2-1.

Figure 2-1: Intervention logic



The OND establishes detailed noise test codes, harmonised noise limits and conformity assessment procedures, enabling the free movement of equipment within the EU internal market while reducing permissible noise levels for such equipment.

For equipment listed in Article 12 with limit values, the Directive sets out three different conformity assessment procedures:

- **Internal control of production with assessment of technical documentation and periodical checking (Annex VI)**: The manufacturer determines the measured sound power level, the uncertainties and the guaranteed value. The manufacturer then prepares the technical documentation, after which it is checked by a Notified Body. For control of production, the manufacturer can choose either checks on the technical documentation to verify compliance of equipment or random product checks, both conducted by a Notified Body;

- **Unit verification (Annex VII)**: The manufacturer prepares an application for the equipment, after which the Notified Body carries out the test and issues the EC conformity certificate;

- **Full quality assurance (Annex VIII)**: The manufacturer prepares or improves the existing quality assurance system, including all relevant necessary information to prove the conformity of a product to the Directive, and determines the measured sound power level, the uncertainties and the guaranteed value. A Notified Body then checks that the QA system ensures compliance of the products with the requirements of the Directive. For control of the production according to the quality system, a Notified Body carries out annual audits on the QA system.

For equipment listed in Article 13 without limit values, the Directive allows for self-assessment, in the form of:

- **Internal control of production (Annex V)**: The manufacturer determines the measured sound power level, the uncertainties and the guaranteed value, and prepares the technical documentation. For control of production, the manufacturer checks the technical documentation, the markings and the Declaration of Conformity.

In all cases, the manufacturer is also obliged to accompany their equipment with an EC Declaration of Conformity (DoC), stating that the equipment is in conformity with the provisions of the OND and any other relevant Directives, and to affix the CE marking and the guaranteed value before placing the equipment on the market. The manufacturer, or their authorised representative, is obliged to keep a specimen of the DoC for 10 years from the last manufacturing date of the equipment, as well as the technical documentation.

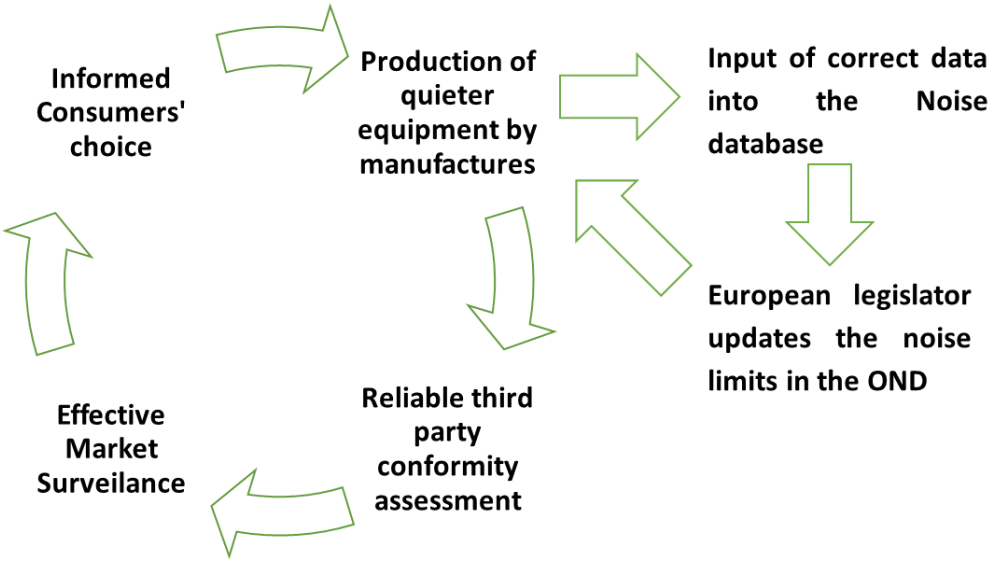
The Commission provides the NOISE online tool and database for manufacturers and their authorised representatives to register the DoCs, and for the Member State authorities to consult and assess the submitted DoCs.

Figure 2-2 illustrates the interaction and contribution required of key players according to the Directive:

- Manufacturers design products in line with the required specifications, carrying out the relevant conformity assessment procedure.

- Notified Bodies assess the conformity of equipment subject to noise limits, ensuring the first level of control for those products.
- Market Surveillance Authorities ensure that all products on the market are in conformity with the rules.
- The customer/user is able to make an informed purchasing decision, preferring less noisy products and therefore stimulating manufacturers to compete also on this specific product characteristic.
- Finally, on the basis of sound data, the European legislator updates the Directive and the noise limits that it establishes.

Figure 2-2: OND cycle and stakeholders' role in reaching the Directive's objectives



Since the OND came into force, it has been amended by:

- Directive 2005/88/EC of the European Parliament and of the Council of 14 December 2005 amending Directive 2000/14/EC on the approximation of the laws of the Member States relating to the noise emission in the environment by equipment for use outdoors[7]. Directive 2005/88/EC sets the stage II noise limits to be applicable from the beginning of 2006. However, these limits are indicative for certain types of equipment, as they were considered technically unfeasible at the time of implementation.

- Regulation (EC) No 219/2009 of the European Parliament and of the Council of 11 March 2009 adapting a number of instruments subject to the procedure referred to in Article 251 of the Treaty to Council Decision 1999/468/EC with regard to the regulatory procedure with scrutiny[8]. Regulation (EC) No 219/2009 empowers the Commission to adopt implementing measures for the adaptation to technical progress of Annex III.

[7] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32005L0088.
[8] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32009R0219.

The European Commission has undertaken several studies to evaluate the implementation of the Directive and explore the possibility of revision. The previous studies are listed as follows:

- In 2007, a Study on the experience in the implementation and administration of Directive 2000/14/EC relating to the noise emission in the environment by equipment for use outdoors (the NOMEVAL study)[9] was carried out. The study aimed to review the existing available noise data and to assess the comparison of measured and guaranteed noise levels, the feasibility of stage I limits, stage II limits and stricter limits; to explore the need for revision of the lists in Articles 12 and 13; to explore the need and possibilities for revision of the limit values laid down in Article 12; to formulate a statement setting out an integrated range of instruments to be used in continuing the reduction of noise by equipment[10]. The study issues recommendations for an update of the equipment list, the noise limits and the test codes. It was also found that many types of equipment currently without noise limits have a higher impact than those with noise limits.

- In 2009, based on the NOVEMAL study, an Impact assessment on possible policy options for reviewing the Outdoor Equipment Noise Directive (the ARCADIS study)[11] was carried out. The study analysed the three scenarios identified in the NOMEVAL study and aimed to enable the Commission to rank the scenarios on their environmental, social and economic merits in order to serve as a basis for proposing appropriate amendments to the Directive. Among the main findings, it was found that more stringent environmental regulation may very well have positive competitiveness effects through stimulating innovation, improving efficiency, creating comparative advantages and spinning off new production activities. With regard to social impacts, the most important impacts that have been identified are on job security and employment, job quality, and public health and safety. More than policy advice, this study offers a tool to evaluate actual and future scenarios.

- In 2009, Working Group 7 (a specific working group of the Noise Committee)[12] carried out a new evaluation of limit proposals and equipment types based on the previous studies. In 2010, the Working Group 7's findings were issued and included recommendations on test codes for each type of equipment currently covered by the Directive, as well for new products possibly going to be introduced in the Directive.

- In 2013 a study was performed (Study on the merger of the Directive on noise from outdoor equipment, 2000/14/EC, with the Machinery Directive, 2006/42/EC), to explore the possibility of merging the OND with the Machinery Directive, 2006/42/EC[13]. The main conclusion was that the two Directives should be kept separate as the Machinery Directive does not outline noise limits.

- In 2016, a study on the suitability of the current scope and limit values of Directive 2000/14/EC relating to the noise emission in the environment by

[9] http://ec.europa.eu/DocsRoom/documents/1639/attachments/1/translations/en/renditions/pdf.
[10] Ibid.
[11] http://ec.europa.eu/growth/tools-databases/newsroom/cf/itemdetail.cfm?item_id=3646&lang=en.
[12] The Working Group 7 was composed of representatives of EU/EFTA countries, industrial and consumer associations and standardisation associations.
[13] http://ec.europa.eu/DocsRoom/documents/4985/attachments/1/translations/.

equipment for use outdoors (the "ODELIA" study)[14] was performed. The ODELIA study investigated whether the potential revision of existing limit values, the introduction of new ones and of new equipment types were justified. Tighter limits were proposed for 9 equipment types, and new limits were proposed for 28 types currently without limits, 13 new equipment types were proposed to be included in the Directive. The study also identified one obsolete equipment type that has been proposed for removal from the Directive (explosion rammers). For 4 equipment types, different limits for electric and CE powered machines were proposed. Among the potential new equipment to be added to the Directive, 9 have been considered out of the scope of the Directive, of insufficient impact or covered by other regulation, 3 types are proposed to be put into Article 13 and 10 types into Article 12.

2.2. Objectives of the study

The aim of this study is twofold. First, it evaluates the OND with regards to the following criteria:

- Effectiveness
- Efficiency
- Coherence
- Relevance
- EU added value

Second, it assesses the impact of options for a possible future revision of the Directive. This report contains the evaluation part of the study, and it focuses on assessing the performance of the Directive with regards to all the equipment listed in Articles 12 and 13 and as defined in Annex I of the OND and for all stakeholders involved.

The evaluation covers all EU28 Member States, Switzerland, the three EFTA members (Iceland, Liechtenstein and Norway) and Turkey. The last evaluation of the OND was performed in 2007 (the "NOMEVAL" study), and the current study, therefore, focuses on the period between 2007 and 2017, comparing the findings and results with those of the NOMEVAL study where appropriate.

3. EVALUATION QUESTIONS

Following on from the above Intervention Logic, the research team has developed an evaluation framework which has guided the researchers when collecting and analysing data to assess the performance of the current legislative text.

The evaluation framework shown in the table on the following pages links the five evaluation dimensions and the corresponding evaluation questions with the indicators and data sources used to answer the questions.

[14] http://ec.europa.eu/DocsRoom/documents/18281/attachments/1/translations/.

Main EQ	Judgement criterion	Specific EQ	Indicators	Literature review	Databases	MSA and NB Survey	Interviews	OPC	CATI interviews
Did the Directive protect the health and well-being of citizens and the environment, by reducing permissible noise levels of such equipment?	Noise levels of outdoor equipment were reduced thanks to the Directive	Were Noise levels of outdoor equipment reduced thanks to the Directive?	Noise levels reached by equipment listed in Article 12 vs 'Original' Noise levels reached by equipment listed in Article 12 Reported opinion of stakeholders on noise produced by outdoor equipment Data on complaints for noise produced by outdoor equipment	x	x	x	x	x	x
	Noise levels of outdoor equipment were reduced by the extent to have an impact on the health and well-being of citizens	Were noise levels of outdoor equipment reduced by the extent to have an impact on the health and well-being of citizens?	Estimated Noise levels impact reached by equipment listed in Article 12 Actual Estimated Noise levels impact reached by equipment listed in Article 12 vs Actual estimated Impact of 'Original' noise level	x		x	x	x	

Main EQ	Judgement criterion	Specific EQ	Indicators	Literature review	Databases	MSA and NB Survey	Interviews	OPC	CATI interviews
	Non-conform products do not reach the market or if do so are identified and their commercialisation stopped	Have Non-certified products reached the market? If so, were they identified and their commercialisation blocked?	Number of notifications received about products already commercialised Stakeholders opinion on certification procedure	x	x	x	x		
	The number of non-conform products shrank over time	How has the number of non-compliant equipment, or notifications of it, changed since 2007?	Number of notifications received about products already commercialised Stakeholders opinion on certification procedure		x	x			
	Market surveillance is in place in all MSs and acts effectively	Have MSs established appropriate authorities and measures to ensure conformity of relevant equipment?	Number of MSs that established surveillance authorities and measures Stakeholders opinion on surveillance method and effectiveness Number of notifications received about products already commercialised	x		x	x		

Main EQ	Judgement criterion	Specific EQ	Indicators	Literature review	Databases	MSA and NB Survey	Interviews	OPC	CATI interviews
			Number of notification received about products already commercialised that were unjustified						
	There are no barriers for the Directive to achieve this objective	Are there any barriers that would hinder the Directive from reaching its strategic objective of protecting the health and well-being of citizens and the environment?	Barriers reported by stakeholders or identified through desk research	x		x	x	x	x
	Unexpected/indirect results: Noise levels of equipment under Article 13 (not subject to permissible sound power levels) were also reduced thanks to the Directive	Were Noise levels of equipment under Article 13 (not subject to permissible sound power levels) also reduced thanks to the Directive?	Noise levels of equipment under Article 13 reached		x	x	x		
Did the Directive ensure an internal market for outdoor equipment, by preventing	The Directive ensured harmonisation of rules and procedures across the EU	Did MSs implement the Directive in a coherent and effective way, ensuring common standards across the EU?	(Lack of) Differences in national legislation in MSs in the implementation of the Directive	x		x	x	x	x

Main EQ	Judgement criterion	Specific EQ	Indicators	Literature review	Databases	MSA and NB Survey	Interviews	OPC	CATI interviews
obstacles to the free movement of such equipment?	Manufacturing companies reaped the benefits of harmonised standards across the Single Market	By merging previous legislation (7 product Directives and 2 procedure Directives), did the Directive simplify legislation improving stakeholders activities?	Stakeholders opinion on the simplification achieved			x	x	x	x
		Was the given choice between different conformity assessment procedures (CAP) a benefit allowing flexibility or created confusion?	Opinion of stakeholders Data about the type of CAPs selected and eventual trends in relation to the type of company (SME vs Large companies) and type of equipment			x	x	x	x
		Was there an increase in the international trade of outdoor equipment?	Trade trends over the year of relevant products		x	x	x		x
	The Directive set achievable standards	Were standards set achievable?	Stakeholders opinion on the standards set Noise levels reached		x	x	x		x

Main EQ	Judgement criterion	Specific EQ	Indicators	Literature review	Databases	MSA and NB Survey	Interviews	OPC	CATI interviews
		Are there specific types of equipment that represent a challenge in meeting the standards?	Stakeholders opinion on the standards set Noise levels reached by category of products			x	x	x	x
	There are no barriers for stakeholders to comply with the Directive	Are there any barriers, in terms of practical and legal issues, in complying with the Directive?	Barriers reported by stakeholders or identified through desk research Barriers to NBs in establishing common procedures Barriers to the industry in complying Barriers to MSAs in conducting market surveillance			x	x	x	x
	Current conformity assessment procedures are effective	Are current conformity assessment procedures effective?	Opinion of stakeholders Statistical data on outcomes of procedures (possibly by type of procedure)			x	x	x	x
	Notified Bodies are established in all MSs according to criteria set by the Directive and	Are Notified Bodies established in all MSs according to criteria set by the Directive?	EC publishes list of NB	x					

Main EQ	Judgement criterion	Specific EQ	Indicators	Literature review	Databases	MSA and NB Survey	Interviews	OPC	CATI interviews
	work effectively								
	The Noise Committee is regularly meeting and its work is effective and useful	Is the Noise Committee regularly meeting and its work effective and useful?	Frequency of meetings Meetings attendance Meetings results Opinion of stakeholders on effectiveness and usefulness of these meetings				x		
	Unexpected/indirect results	Did the Directive have any unexpected/indirect results?				x	x		
	Unexpected/indirect results: The Directive hindered R&D in the industry	Did compliance with the Directive hindered R&D in the industry?	Opinion of stakeholders				x		
	Unexpected/indirect results: The Directive stimulated R&D in the industry	Did compliance with the Directive stimulated R&D in the industry?	Opinion of stakeholders				x		
	Unexpected/indirect results: The Directive reduced competition from manufacture	Was competition from manufacturing companies extra-EU affected by the lower	Trade trends over the year of relevant products		x	x	x		x

Main EQ	Judgement criterion	Specific EQ	Indicators	Literature review	Databases	MSA and NB Survey	Interviews	OPC	CATI interviews
	companies extra-EU due to lower noise standards	noise standards set by the Directive?							
Relevance									
Was the Directive relevant to the needs of the users and the environment?	In the early 2000 noise level of outdoor equipment were too high and there was a risk for the health and well-being of citizens and environment	At the time of the Directive, were noise levels of outdoor high to the extent to pose a risk to the health and well-being of citizens and the environment?	Noise levels registered at the time Stakeholders opinion on noise levels and their impact on the health and well-being of citizens and environment Studies on the impact of noise on health and well-being						
		Was there a demand for quieter outdoor equipment?	Opinion of stakeholders						
Is the Directive relevant to the needs of the users and the environment?	Today noise level of outdoor equipment (Article 12) are still too high and there is a risk for the health and well-being of citizens and environment	Today, are noise levels of outdoor equipment (Article 12) still too high to the extent to pose a risk to the health and well-being of citizens and the environment?	Today noise levels of Article 12 outdoor equipment Stakeholders opinion on noise levels and their impact on the health and well-being of citizens	x		x	x	x	x

Main EQ	Judgement criterion	Specific EQ	Indicators	Literature review	Databases	MSA and NB Survey	Interviews	OPC	CATI interviews
			and environment						
		Is there a demand for quieter outdoor equipment?	Opinion of stakeholders				x		
	Today noise levels of outdoor equipment (Article 13) are too high and there is a risk for the health and well-being of citizens and environment	Today, are noise levels of outdoor equipment (Article 13) still too high to the extent to pose a risk to the health and well-being of citizens and the environment?	Today noise levels of Article 13 outdoor equipment Stakeholders opinion on noise levels and their impact on the health and well-being of citizens and environment	x		x	x	x	x
Was the Directive relevant to the needs of the industry?	In early 2000, the market was fragmented due to different noise levels national standards and the industry could not easily sell products in every EU country	At the time of the Directive, was the market for outdoor equipment fragmented due to different noise levels national standards? Was it fragmented to the extent to impede the circulation of outdoor equipment or to impose excessive costs	Standards in place across Europe Stakeholders opinion on market fragmentation						

Main EQ	Judgement criterion	Specific EQ	Indicators	Literature review	Databases	MSA and NB Survey	Interviews	OPC	CATI interviews
		to companies?							
Is the Directive still relevant to the needs of the industry?	The market is still fragmented and there is a need for greater harmonisation (e.g. extending the list of Article 12)	Today, is the market for outdoor equipment fragmented due to different noise levels national standards? Is it fragmented to the extent to impede the circulation of outdoor equipment or to impose excessive costs to companies?	Standards in place across Europe Stakeholders opinion on market fragmentation	x		x	x	x	x
Efficiency									
Was the Directive implemented efficiently?	The Directive reduced administrative burdens for the activities of European and national authorities	Did the Directive reduce administrative burdens for stakeholders activities?	Opinion of stakeholders on administrative burdens Data on resources and procedure required before and after the Directive			x	x		
		What administrative costs arise due to compliance	Data on administrative costs (provided by			x	x		

Main EQ	Judgement criterion	Specific EQ	Indicators	Literature review	Databases	MSA and NB Survey	Interviews	OPC	CATI interviews
		procedures?	authorities)						
	Current conformity assessment procedures are efficient	Are Current conformity assessment procedures efficient?	Opinion of stakeholders and data (possibly by type of procedure) on: - time to response - cost of the procedures - cost per procedure			x			
	Participation to the Committee is resource efficient in comparison to benefits obtained	What resources are used to take part in the Committee?	Data on resources used			x	x		
		Are actual resources sufficient?	Opinion of stakeholders			x	x		
		How do they compare with the benefits arising from participation to the committee?	Opinion of stakeholders			x	x		
	Burdens placed on the industry are balanced by economic benefits (e.g. increased trading across Europe)	Did the Directive introduce unnecessary burdens for manufacturers and other economic operators?	Opinion of stakeholders on burdens placed on the industry Data on resources and procedure required for the industry to comply				x	x	x

Main EQ	Judgement criterion	Specific EQ	Indicators	Literature review	Databases	MSA and NB Survey	Interviews	OPC	CATI interviews
			with the Directive						
		What administrative costs arise due to conformity procedures?	Data on administrative costs (provided by industry) Cost per procedure				x	x	x
		Were burdens placed on the industry level off or exceeded by the benefits of increased trading across Europe?	Opinion of stakeholders on burdens on the industry and intra-Europe trade level Data on resources and procedure required for the industry to comply with the Directive Value of trading in relevant equipment across Europe		x	x	x	x	x
		Are SMEs disproportionately affected by the Directive's requirements in comparison to larger enterprises?	Opinion of stakeholders on burdens on SMEs Data on resources and procedure required to the industry to comply with the Directive		x	x	x		x

Main EQ	Judgement criterion	Specific EQ	Indicators	Literature review	Databases	MSA and NB Survey	Interviews	OPC	CATI interviews
			compared to the average turnover of SMEs						
		Are there elements of the Directive that require more resources (manpower, time, etc.) in comparison with others?	Opinion of stakeholders on Directive resource requirements			x	x		x
	Results achieved in relation to market fragmentation could not have been achieved at a lower cost	Could the strategic objective of ensuring an internal market for outdoor equipment be achieved at a lower cost?	Opinion of stakeholders			x	x	x	x
	Results achieved in relation to the protection of health and well-being of citizens and environment could not have been achieved at a lower cost	Could the strategic objective of protecting the health and well-being of citizens and the environment be achieved at a lower cost?	Opinion of stakeholders			x	x	x	x
Coherence									

Main EQ	Judgement criterion	Specific EQ	Indicators	Literature review	Databases	MSA and NB Survey	Interviews	OPC	CATI interviews
Internal coherence: Is the Directive coherent with other EU legislation?	The Directive is coherent and does not overlap / conflicts with other EU legislation	Are there any overlaps/conflicts with other EU legislation?	Overlaps/ conflicts reported by the stakeholders or identified through desk research	x		x	x	x	x
	The Directive complement other EU legislation	Does the Directive complement other EU legislation / policies?	Opinion on complementarity expressed by the stakeholders Data identified through desk research	x		x	x	x	x
	There are no gaps left by the Directive	Does the Directive leave gaps?	Opinion and data on gaps reported by the stakeholders See Options for IA	x		x	x	x	x
	By merging previous legislation, the Directive improved the coherence of the EU legislative framework	By merging previous legislation (7 product Directives and 2 procedure Directives), did the Directive improve the internal coherence of EU legislation?	Opinion expressed by the stakeholders Conflicts/ overlaps/ gaps previously existing and removed by the Directive	x		x	x	x	x

Main EQ	Judgement criterion	Specific EQ	Indicators	Literature review	Databases	MSA and NB Survey	Interviews	OPC	CATI interviews
External coherence: Is the Directive coherent with non-EU legislation (national or international)?	The Directive is coherent and does not overlap/ conflicts with other non-EU legislation	Are there any overlaps/conflicts with other non-EU legislation?	Overlaps/ conflicts reported by the stakeholders or identified through desk research Evidence of stricter requirements imposed at the national level	x		x	x	x	x
	The Directive complement other non-EU legislation	Does the Directive complement non-EU legislation / policies?	Opinion on complementarity expressed by the stakeholders Data identified through desk research	x		x	x	x	x
EU Added Value									
Would have the same results in relation to the strategic objectives been possible without the EU intervention?	Without the Directive standards across Europe would still differ hindering circulation of products	Would have the same results in relation to market fragmentation been possible without the EU intervention?	Opinion of stakeholders Existing national legislation at the time of the Directive	x		x	x	x	x
	Without the Directive noise levels of outdoor equipment (Article 12) would still be high and would pose a risk to the health and well-being of citizens and	Would have the same results in relation to the protection of health and well-being of citizens and environment been possible without the EU	Opinion of stakeholders Market trends Actual Estimated Noise levels impact reached by equipment listed in Article 12 vs Actual			x	x	x	x

Main EQ	Judgement criterion	Specific EQ	Indicators	Literature review	Databases	MSA and NB Survey	Interviews	OPC	CATI interviews
	environment	intervention?	estimated Impact of 'Original' noise level						
Would the results achieved remain if the Directive was withdrawn?	Without the Directive standards across Europe would differ again hindering circulation of products and possibly negatively affecting health and well-being of citizens and environment	What would happen if the Directive was withdrawn?	Opinion of stakeholders			x	x	x	x

4. METHOD

The data collection process for this study was organised around 6 tasks:

- Review of the literature;
- Interviews with EU and national stakeholders;
- CATI interviews;
- Case study;
- Open public consultation; and
- Survey of Market Surveillance Authorities (MSAs) and Notified Bodies (NBs).

This section presents an overview of the situation of each task.

4.1. Literature review

The task was carried out in three steps.

1. The study used several search tools (e.g. Google Scholar, EBSCO, ScienceDirect) to identify a long list of relevant articles.
2. Out of these articles, about 60 were selected on the basis of relevance, chronological and reliability criteria.
3. Shortlisted literature was analysed, and the outcomes were fed into the report.

Academic and policy literature on technical and economic aspects of outdoor equipment noise, as well as on the environmental, social and health impacts of noise were sought in international sources (e.g. WHO, green and white papers, EC evaluation studies, position papers, EU project results) but in key national documents in the local language (e.g. National research projects, National Health Council reports). The literature review also identified experiences from other key trading partners (such as USA, China, South Korea, Japan, Brazil etc.).

4.2. Interviews with EU and national stakeholders

One of the key sources of information for the study is the consultation conducted with different types of stakeholders that are directly affected by the Directive at EU and national levels.

Interviews at the national level were to be conducted in 16 MS (see table below) selected to ensure interviews distribution across Europe and MS of different sizes. However, the responsiveness of national organisation has been low, more details are provided further below.

Table 4-1: List of MS interviews

MS	Geographical location	Size of the MS[15]
Austria	West	Medium
Bulgaria	East	Medium

[15] Based on the key used for Qualified Majority Voting. For example in Magnette, P. and K. Nicolaidis (2003). Large and Small Member States in the European Union: Reinventing the Balance. Research and European Issues No. 25, May 2003, Updated version June 5, 2003. pp. 10. Available at: https://infoeuropa.eurocid.pt/files/database/000005001-000010000/000007080.pdf.

Croatia	East	Small
Czech Republic	East	Medium
Denmark	North	Small
Germany[16]	West	Large
Finland	North	Small
France	West	Large
Italy	South	Large
Lithuania	North	Small
Netherlands	West	Medium
Poland	East	Large
Portugal	South	Medium
Spain	South	Large
Sweden	North	Medium
United Kingdom[17]	North	Large

Interviews were conducted with the following stakeholders:

- EU level sector organisations
- National Consumer/Environmental associations in selected MSs[18]
- Environmental offices in selected MSs[19]
- The European Committee for Standardisation (CEN)
- New approach consultants and sector experts.

Overall, the study team completed 32 interviews.

Table 4-2 below lists the interviews conducted for each stakeholder category.

Table 4-2: Conducted interviews

Stakeholder category	Organisation name
EU sector organisations	EuropGen
	EUnited Cleaning

[16] Focusing on the Bavarian Bundesland.
[17] Limited to a UK based expert in the OND surveillance.
[18] The Study team reached out to about 100 organisations and environmental offices in 16 MS (Austria, Bulgaria, Croatia, Czech Republic, Denmark, Germany, Finland, France, Italy, Lithuania, Netherlands, Poland, Portugal, Spain, Sweden, United Kingdom) selected to provide a good geographic distribution of the interviews and on the basis of relevant market size. However, only consumer/environmental associations in Croatia, Germany, Finland, France showed interest in participating in the study. Also only environmental offices in Bulgaria, Germany, France were available for an interview.
[19] See previous footnote.

	EUnited Municipal Equipment
	FEM (European Materials Handling Federation)
	CEMA (European Agricultural Machinery)
	Orgalime
	EPTA (European Power Tool Association)
	EGMF (The European Garden Machinery Industry Federation)
	CECE (Committee for European Construction Equipment)
	ISMA (International Snowmobile Manufacturers Association)
National consumers organisations	Suomen Kuluttajaliitto (FI)
	Association antibruit de voisinage (FR)
	Verbraucherzentrale Hamburg (DE)
National interest groups	Institute for the Advancement of Safety (HR)
Environmental organisation	The Finnish Association for Nature Conservation (FI)
Environment local offices	Mairie de Paris, Responsable de la Division Impacts Santé – Environnement (FR)
	Plovdiv Municipality (BG)
	City of Munich, Department for Health and Environment (DE)
	City of Berlin, Senate Department for the Environment, Transport and Climate Protection (DE)
	Federal Environmental Agency (DE)
Public authorities	Ministry of Health, State Inspection for Ecology and Legal Support, Unit for General Use Objects and Noise Protection (HR)
Sector experts	Four experts interviewed
Standardisation	European Committee for Standardization - CEN
Market Surveillance Authorities	One representative interviewed (IT)
Notified Bodies	Three representatives interviewed (DE, IT)
Manufacturing companies	EMAK (IT)
	Stiga (IT)
Total	**32**

4.3. CATI interviews

The CATI interview process started in September 2017 and was closed in April 2018.

The research team gathered input from 441 manufacturers and 98 rental/leasing companies. About 370 manufacturing companies were SMEs and more than two-thirds micro or small enterprises. Table 4-3 presents the final status of the interviews conducted by country and type of company.

Table 4-3: Breakdowns of the interviews conducted compared to the initial target (in number of interviewees per countries)

	Interviews conducted		
Country	**Manufacturing**	**Rental**	**Total**
Austria	17	5	22
Belgium	18	8	25
France	55	13	48
Germany	51	13	50
Ireland	7	8	12
Italy	105	15	104
Netherlands	37	8	41
Poland	43	8	50
Spain	70	9	49

Sweden	19	9	23
Not specified	18[20]		
Total	441	98	539

4.4. Case study

One case study was carried out in the Netherlands about two relief schemes that have been active since 2001. The *Milieu-investeringsaftrek* (MIA, Environmental Investment Deduction) and the *Willekeurige afschrijving milieu-investeringen* (Vamil, Voluntary Depreciation on Environmental Investment) are fiscal incentives that offer entrepreneurs the opportunity to make investments in environmentally friendly techniques in a fiscally attractive way.

For this case study, 14 documents were reviewed, and two interviews were conducted, one with the Ministry for Infrastructure and the Environment of the Netherlands and the other with the Netherlands Enterprise Agency.

4.5. Survey of Market Surveillance Authority and Notified Bodies

An online survey addressed to Notified Bodies (NB) and Market Surveillance Authorities (MSA) in all the 28 Member States, 3 EFTA members, Turkey and Switzerland was conducted.

The survey carried out electronically through SurveyGizmo, ran from 15 September to 15 November 2017. During this time, 232 Notified Bodies and 30 Market Surveillance Authorities were contacted, and five rounds of reminders were sent in addition to the original invitation. The survey was also internally disseminated by Market Surveillance Authorities and Notified Bodies chairing their respective working groups.

Overall, the survey gathered 45 answers, from 20 different EU countries and 4 non-EU countries:

- 11 from Market Surveillance Authorities; and
- 34 from Notified Bodies.

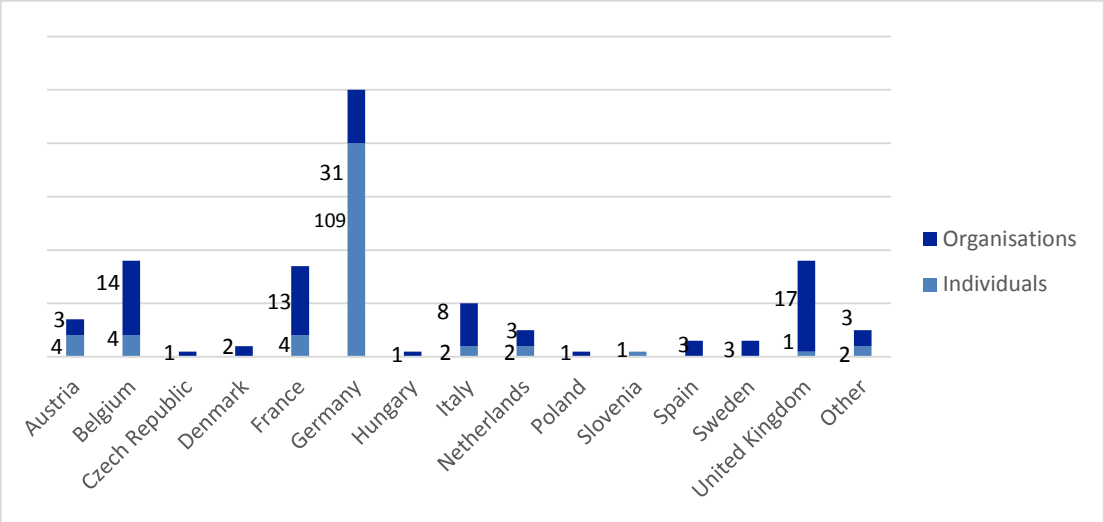
4.6. Open Public Consultation

The Open Public Consultation collected contributions from all interested parties, stakeholders, organisations and citizens in general who are affected by the Directive, its current functioning or any potential future modifications.

The consultation was launched as an electronic survey on 23 January 2018 and ran for 12 weeks until 18 April 2018. The final results are included in the present document. 232 stakeholders (129 individuals, 103 organisations) took part in the public consultation (see Figure below).

[20] 18 manufacturers who participated to the survey did not specify their country of origin.

Figure 4-1: Country of origin of the participants to the open public consultation (N=232)[21]



Different types of organisations (n=103) took part in the public consultations including:

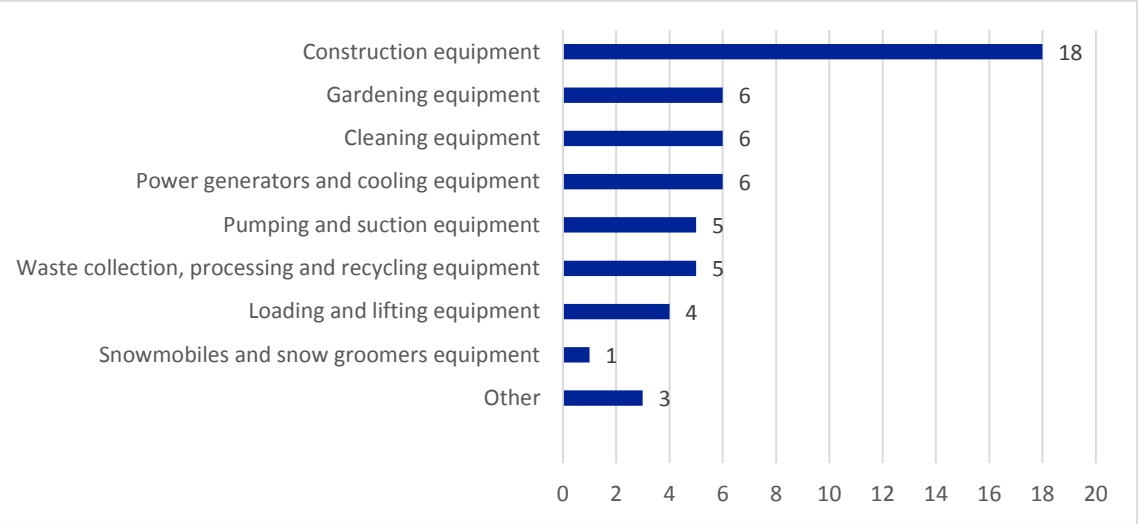
- Private enterprises (n=38)
- Trade, business or professional associations (n=24)
- Regional and local public authorities (n=14)
- International or national public authority (n=9)
- Non-governmental organisations, platforms or networks (n=5)
- Professional consultancies, law firms, self-employed consultants (n=3)
- Research and academia (n=3)
- Other (n=7)[22]

The majority of the **private enterprises** represented are large enterprises (72%, n=23). About 84% (n=32) of them are manufacturers of outdoor equipment covered by the Directive and in particular of construction equipment (47%, n=18).

[21] EU countries not represented are: Bulgaria, Croatia, Cyprus, Estonia, Finland, Greece, Latvia, Lithuania, Luxembourg, Malta, Portugal, Romania, Slovakia. The participants coming from non-EU countries come from Switzerland and the USA.

[22] Out of the 7 respondents who indicated other: 1 is a public enterprise, 2 are manufacturers of machines, 1 is a Notified Body, 1 is an organism in charge of standards, 1 is a local authority and 1 is an NGO.

Figure 4-2: Type of equipment produced or distributed by the private enterprises which took part in the Open Public Consultation (n=38)[23]



As for respondents included in the **trade, business or professional associations**, 88% (n=21) of them are business organisations. All of the trade, business or professional associations represent manufacturers of outdoor equipment covered by the Directive or companies using such equipment.

129 participants in the consultation responded as **individuals**[24]. Out of these, only 5% (n=12) reported being **users** of outdoor equipment while the majority (45% n=105) reported being exposed to noise emissions by outdoor equipment. All the users of outdoor equipment (n=12) are using or buying mostly gardening equipment.

Out of the 232 participants, 39% (n=91) have detailed knowledge of the Directive, its objectives, the limits and the requirements/obligations that it imposes. 25% is aware of the existence of the Directive but not of all its specific contents. About 35% (n=82), mostly either people exposed to noise from outdoor equipment or users of such equipment, indicated that they did not know the Directive. They were not asked questions related to the functioning of the OND but a set of questions investigating their experience with sources of outdoor noise and usage habits.

4.7. Data limitations

There are a number of limitations with the data that were available or could be collected during the study.

Noise emission data - baseline

At the time the OND came into force, little information was available on noise emissions of the covered equipment and the state of the art of it. The noise limits introduced with the OND aimed at eliminating the noisiest equipment on the market (estimated at about 30%). Existing legislation, the previous product specific Directives (see sections 2.1 and 5.5), and the 2005 amendment provide a baseline for

[23] Some of the respondents are active in several sectors.
[24] Individuals here relate to the stakeholder category (as opposed to the respondents who participated on behalf of an organisation).

equipment covered[25]. For the remaining equipment without limits (Article 13), an average reduction of 1 dB due to technical progress and some market demand is estimated. For some equipment with higher demand for quieter products, more progress has been made than others, although it may not apply to the whole fleet.

Number of companies and equipment fleet data

Estimating the number of EU manufacturing companies in the market is particularly complex. No official data are available and NACE codes used by Eurostat statistics are too broad to provide a precise picture.

Similarly, equipment fleet data could not be assessed using available statistics as the code system used (Prodcom) covers broad categories which, in most cases, do not match with specific equipment.

A combination of desk research, data from the EC NOISE database and expert opinion was used to produce an estimate which was then validated by sector organisations.

Data on non-compliant equipment on the market

No data was found on the existence of non-compliant equipment on the market. Also, stakeholder views on the matter are patchy and mostly rely on anecdotal knowledge. Studies that assessed the compliance with other Directives and requirements (e.g. NOMAD project[26]) were used to provide an indication of the potential scope of the issue.

Consumers participation

Consumers participation in the study has been low. Few consumer associations are actively engaged in this specific topic which indicates that other issues are higher on their agenda. This is a finding per se, although it made it difficult to capture the views of consumers on the issue of outdoor noise.

[25] Compressors; Concrete Breakers; Construction Plant Equipment; Hydraulic Excavators; Lawnmowers; Power Generators; Tower Cranes; Welding Generators; Dumpers, graders, loader-type landfill compactors, combustion-engine driven counterbalanced lift trucks, mobile cranes, compaction machines (non-vibrating rollers), paver-finishers, hydraulic power packs. Tracked dozers, tracked loaders, tracked excavator-loaders. Compaction machines (vibrating rollers, vibratory plates, vibratory rammers). Excavators, builders' hoists for the transport of goods, construction winches, motor hoes.

[26] NOMAD Steering Committee (2012). Report on the 'NOMAD' project – A survey of instructions supplied with machinery with respect to noise and the requirements of the Machinery Directive. Available at: http://www.hse.gov.uk/noise/nomad-report.pdf;
Pelkmans, J., Correia de Brito, A., Griner, A. and Luchetta, G. (2014) study on the merger of the directive on Noise from Outdoor Equipment, 2000/14/EC, with the Machinery Directive, 2006/42/EC (including an evaluation of Directive 2000/14/EC) - final report. Available at: https://ec.europa.eu/docsroom/documents/4985/attachments/1/translations/en/renditions/pdf.

5. STATE OF PLAY

5.1. Policy context

As discussed in Chapter 2, the OND is part of a **wider environmental noise legislative framework**. The Environmental Noise Directive 2002/49/EC (END)[27] is the main EU instrument to identify and address noise pollution levels and to protect both the environment and citizens from the negative impacts of noise[28]. Its three action areas are:

- Determining the exposure to environmental noise;
- Ensuring that information about both environmental noise and its effects are made available to the public; and
- Preserving environmental noise quality where it is good and preventing and reducing environmental noise where it is not[29].

The END foresees noise mapping and action planning for road, rail, aircraft and industrial noise. Of these, industrial noise is relevant for outdoor equipment. The END does not apply to noise caused by the exposed person or neighbours, noise due to military activities in military areas or from domestic activities, or noise at the workplace or inside means of transport (Article 2(2)). It is however complemented by a range of legislation regulating environmental noise at the source, including, but not limited to, Regulation No. 540/2014[30] on motor vehicles, Regulation No 216/2008[31] and Regulation No 748/2012[32] on limitation of the noise from aeroplanes, Directive 2008/57/EC[33] on railway interoperability, as well as the OND which predates it by two years[34].

In terms of **workplace health and safety**, Directive 2003/10/EC[35] on the minimum health and safety requirements regarding the exposure of workers to the risks arising from physical agents (noise) sets the minimum requirements to protect workers from noise exposure, particularly its impacts on hearing. The OND, in conjunction with the Machinery Directive 2006/42/EC (MD)[36], provides for the requirement of information to be included about the noise emissions, to allow the evaluation of noise levels in the workplace, and selection of equipment with lower noise emission levels[37].

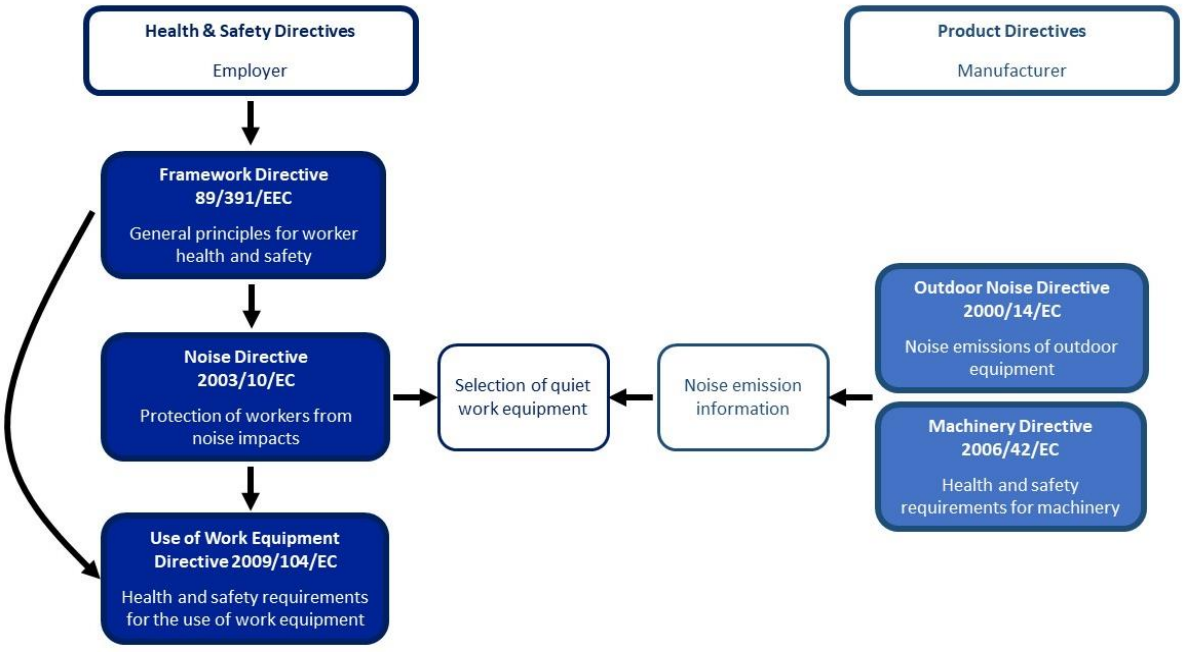
The Machinery Directive is one of the main pieces of legislation governing the harmonisation of health and safety requirements for machinery. It promotes free movement within the Single Market and guarantees a high level of protection for both workers and citizens. It applies to products that are placed on the EU market for the

[27] http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32002L0049.
[28] European Commission (2016). Noise – Environmental Noise Directive. Available at: http://ec.europa.eu/environment/noise/directive_en.htm.
[29] Ibid.
[30] http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32014R0540.
[31] http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32008R0216.
[32] http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32012R0748.
[33] http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32008L0057.
[34] European Commission (2016). Noise – Noise sources. Available at: http://ec.europa.eu/environment/noise/sources_en.htm.
[35] http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:02003L0010-20081211.
[36] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32006L0042.
[37] Directorate-General for Employment, Social Affairs and Inclusion (2007). How to avoid or reduce the exposure of workers to noise at work. Non-binding guide to good practice for the application of Directive 2003/10/EC of the European Parliament and of the Council on the minimum safety and health requirements regarding the exposure of workers to the risks arising from physical agents (Noise). Available at: https://publications.europa.eu/en/publication-detail/-/publication/966d34a0-a10f-4d93-9672-d314438234d6/language-en.

first time[38].The MD contains a set of requirements to reduce noise emissions in the design and manufacturing of products. Based on the New Approach Legislation, it makes use of harmonised standards, unlike the OND which uses measurement methods and test codes developed at the time the Directive was drafted (see section 6.1.9). In addition, as the MD governs health and safety requirements of the machinery particularly from the user's perspective, it addresses sound pressure level[39], which describes the noise emissions at the operator position. OND, governing environmental noise, addresses sound power level[40], which describes the total sound energy flow in the air.

Figure 5-1 illustrates the relationship between the European health and safety Directives and the product Directives addressing noise impacts, and how they both guide the selection of quieter equipment for the workplace and protection of workers from the harmful effects of noise. For the health and safety of workers, the Framework Directive 89/391/EEC[41] sets the basic principles of prevention, assessment and elimination of risks of occupational accidents and diseases. It obliges the EU to adopt individual Directives in the areas of, among others, workplaces and work equipment (Article 16(1)). Under this obligation, Directive 2003/10/EC addresses the protection of workers from noise exposure, and Directive 2009/104/EC[42] addresses the health and safety of the use of work equipment.

Figure 5-1: Interrelations between Health and Safety of Workers Directive and Machinery and Outdoor Noise Directives



Source: Adapted from Directorate-General for Employment, Social Affairs and Inclusion, 2007, p. 99[43]

[38] European Commission, 2018, Machinery. Available at: http://ec.europa.eu/growth/sectors/mechanical-engineering/machinery_en.

[39] The emission sound pressure is generally given as an A-weighted sound pressure level, LpA. It describes the sound directly caused by the machine at a given position, such as its workstation.

[40] The sound power is measured in watts (W) and normally given as an A-weighted sound power level, LwA, in decibels ref. pW. It is a measure of the total sound energy flow emitted by the machine in the air.

[41] http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:01989L0391-20081211.

[42] http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32009L0104.

[43] Directorate-General for Employment, Social Affairs and Inclusion (2007). How to avoid or reduce the exposure of workers to noise at work. Non-binding guide to good practice for the application of Directive

Another piece of legislation affecting equipment in the scope of the OND is the Non-Road Mobile Machinery Regulation (EU) 2016/1628 (NRMM Regulation)[44]. It addresses pollutant emissions from combustion engines, by setting emission limits for engines with different power ranges and lays down the procedures to be followed for type-approvals. Among other types, it covers small gardening and handheld equipment and construction machinery which are also in the scope of the OND, as well as snowmobiles which are among the suggested equipment to be added to the OND according to the ODELIA study[45].

In December 2017, the Commission proposed a **"Goods package"** to address two identified structural weaknesses of the single market of goods, the **compliance and enforcement** of EU harmonised product safety rules and the use of **mutual recognition**. The proposal COM(2017) 795 final[46] addresses compliance and enforcement, with the aim to consolidate the existing market surveillance framework, to encourage joint actions by Market Surveillance Authorities from multiple Member States, to improve the exchange of information and coordination, and to create a strengthened framework for controls on products entering the market. It also includes provisions for the Member States to equip MSAs with the necessary financial resources to properly perform their tasks (Article 21(1)) and for the Union to potentially finance the implementation of national market surveillance strategies (Article 36(2f)).

The proposal COM(2017) 796 final[47] addresses mutual recognition, by clarifying and simplifying the procedures for businesses and public administration. It includes a mutual recognition declaration (Article 4) for the producer to draw up to demonstrate to competent authorities of a Member State that the goods, or the goods of that type, are already lawfully marketed in another MS. It also includes a problem-solving procedure (Article 8) making use of the SOLVIT[48] mechanisms and empowering the Commission to intervene by issuing an Opinion and making recommendations where required. The role of product contact points as communication channels for mutual recognition is enhanced (Articles 9, 10). The proposal also includes a number of tools to support cooperation between officials and authorities.

On the national level, a number of **voluntary incentives** have been introduced to motivate the stakeholders towards further noise control. As an example, the Netherlands established two tax relief schemes in order to incentivise manufacturers

2003/10/EC of the European Parliament and of the Council on the minimum safety and health requirements regarding the exposure of workers to the risks arising from physical agents (Noise). Available at: https://publications.europa.eu/en/publication-detail/-/publication/966d34a0-a10f-4d93-9672-d314438234d6/language-en.

[44] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32016R1628.

[45] Dittrich, M. (TNO), Spellerberg, G. (TÜV-Nord) Carletti, E. and Pedrielli, F. (IMAMOTER) (2016). Study on the suitability of the current scope and limit values of Directive 2000/14/EC relating to the noise emission in the environment by equipment for use outdoors ("ODELIA") – Final Report. European Commission, Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs. Available at: http://ec.europa.eu/DocsRoom/documents/18281/attachments/1/translations/.

[46] Proposal for a Regulation of the European Parliament and of the Council laying down rules and procedures for compliance with and enforcement of Union harmonisation legislation on products and amending Regulations (EU) No 305/2011, (EU) No 528/2012, (EU) 2016/424, (EU) 2016/425, (EU) 2016/426 and (EU) 2017/1369 of the European Parliament and of the Council, and Directives 2004/42/EC, 2009/48/EC, 2010/35/EU, 2013/29/EU, 2013/53/EU, 2014/28/EU, 2014/29/EU, 2014/30/EU, 2014/31/EU, 2014/32/EU, 2014/33/EU, 2014/34/EU, 2014/35/EU, 2014/53/EU, 2014/68/EU and 2014/90/EU of the European Parliament and of the Council, available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM:2017:795:FIN.

[47] Proposal for a Regulation of the European Parliament and of the Council on the mutual recognition of goods lawfully marketed in another Member State, available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM:2017:796:FIN.

[48] The SOLVIT network (http://ec.europa.eu/solvit/), set up by the Commission and the Member States, assists citizens and businesses with disputes with public authorities.

to produce more eco-friendly products and to balance out the additional costs. These foresee tax advantages for manufacturers who invest in the development of environmental products where one of the criteria considered is the reduction of noise emissions. Text Box 5-1 below provides a description of the schemes. This is one of the few examples of incentives available for manufacturers in Europe to produce quieter equipment.

Stakeholders reported that a small tax incentive is also available in Italy, while other countries allow longer operating hours for quieter equipment or limit the use of noisier products in certain areas (e.g. the example was mentioned of Sweden, where combustion engine lawnmowers cannot be used in certain spaces). Manufactures and rental companies interviewed are somewhat sceptical about the effectiveness of these type of incentives with only about a fifth of them (n=98) stating that these measures would drive the market toward less noisy products.

Text Box 5-1: *MIA-Vamil*, the Netherlands

The *Milieu-investeringsaftrek* (MIA, Environmental Investment Deduction) and the *Willekeurige afschrijving milieu-investeringen* (Vamil, Voluntary Depreciation on Environmental Investment) are two intertwined tax relief schemes in the Netherlands with the main goal to offer entrepreneurs the opportunity to make investments in environmentally friendly techniques in a fiscally attractive way. As the schemes are very similar and in the daily language referred to as one, even by the Dutch Ministry officials during interviews and in their brochures, they are treated as one entity. The scheme has been designed at the turn of the century and has been active since 2001.

The scheme was designed by the Ministries of Finance and for Infrastructure and Environment of the Netherlands and is executed by the *Rijksdienst voor Ondernemend* (RVO, Netherlands Enterprise Agency) and the Dutch Tax Administration. The MIA-scheme allows entrepreneurs to deduct up to 36% of the cost of an environmentally friendly investment from their fiscal profit; this is in addition to the regular tax reliefs for entrepreneurs. The Vamil-scheme lets entrepreneurs decide themselves when to write off 75% of the costs of their environmentally friendly investment to be able to declare this investment to the Tax Authority in the fiscally most attractive way. For certain investments, a combination of both schemes can be used; in practice, a combination of both schemes is used for 71% of the applications[49].

The budget for the MIA for 2017 was EUR 97 million, and for the Vamil it is EUR 40 million.

Equipment covered

All equipment eligible for the MIA/Vamil-scheme is specified in a list called the *Milieulijst* (Environmental List). This list contains 270 items, called *bedrijfsmiddelen* (capital assets), which cause less environmental damage and usually surpass the minimum legal requirements. This list is updated annually considering the latest technological insights, and often new innovations are

[49] Van Heekeren & Firma Management Consultants bv, (2012) Evaluatie MIA en VAMIL 2005-2010, p. 27. Available at: https://www.rijksoverheid.nl/binaries/rijksoverheid/documenten/rapporten/2013/09/17/mia-vamil-evaluatierapport-2005-2010/mia-vamil-evaluatierapport-2005-2010.pdf.

added, or even more stringent criteria are applied than during the years before. Furthermore, businesses (suppliers and entrepreneurs) can propose to add a particular capital asset they produced or designed onto the list. There are at least five criteria with which these products must comply in order to be added to the list:

1. The use of the business asset must have a significant positive environmental impact, considering:
   - The nature of the emission that is reduced;
   - The extent to which this emission is reduced;
   - The nature of the technology used;
   - The available budget;
   - The additional costs compared with the less environmentally friendly, current alternative.
2. There must be additional costs in comparison to the less environmentally friendly, current alternative;
3. The business asset may not be commonly used;
4. The (further) market introduction must be desirable in the short-term;
5. It must go beyond what is currently legally required.

Not all 270 items are relevant to the scope of this study. The most relevant category is the one of mobile machines. The MIA/Vamil-scheme covers seven types of equipment included in the OND foreseeing noise emission limits on average 4% stricter than those foreseen by the OND:

- Dump truck with power ≤ 55 kW and > 55 kW
- Excavator with power ≤ 15 kW and > 15 kW
- Lawnmower with a cutting width ≤ 120 cm and > 120 cm
- Loader with power ≤ 66 kW and > 66 kW
- Mobile crane (including telescopic crane) with power ≤ 55 kW and > 55 kW
- Street sweeper with power ≤ 10 kW and > 10 kW
- Wood shredder with an input diameter >50 mm; ≤ 200 mm and > 200 mm.

Other five types are currently not covered by the OND:

- Agricultural or forestry tractor
- Crusher
- Forklift with power ≤ 55 kW and > 55kW
- Garbage truck
- Motor pump with power ≤ 35 kW and > 35 kW

Results

The scheme has been in use for 16 years already and has survived many rounds

of evaluation. The scheme has shown to be effective in promoting market introduction of more environmentally friendly capital assets, in advancing innovation and doing so in an efficient manner[50].

The Secretary of State of the Netherlands, Frans Weekers, endorsed these conclusions in his letter to the Dutch Parliament in which he stressed the efficiency and efficacy of the MIA/Vamil-scheme and argued for the maintenance of the instrument[51]. The Netherlands Enterprise Agency reported that entrepreneurs are satisfied with the scheme as it enables them to make investments that otherwise would not have been financially possible[52].

5.2. Implementation of the Directive

The Member State laws and regulations necessary to implement the OND were due 3 July 2001, and to be applied from 3 January 2002. Table 5-2 details the transposition in each Member State.

A standing committee, known as "**Noise Committee**" has been established according to Article 18. The "**Noise Working Group**" established under the Committee meets usually biannually: it is chaired by the Commission and includes representatives of the Member States and other countries where the Directive is applicable, as well as European associations of manufacturers, trade unions, consumer and environmental associations, coordination of Notified Bodies, standardisers (CEN), technical experts and other stakeholders and interested parties (Article 18a).

The **NOISE database** (see section 2.1) was set up by the Commission and is currently available through the Growth e-Services Portal[53]. Manufacturers and their authorised representatives are obliged to register the Declarations of Conformity through the Portal.

The NANDO (New Approach Notified and Designated Organisations) information system[54] lists all active **Notified Bodies** in the Member States, EFTA countries (EEA members) and other countries[55]. As of June 2018, there are 59 NBs in 21 countries (19 MSs, plus Switzerland and Turkey) registered in the system that are dealing with the measurements established by the OND. There are no dedicated NBs in Cyprus, Estonia, Greece, Ireland, Latvia, Lithuania, Malta, Portugal or Spain. The list of Notified Bodies is provided in the Annex.

[50] Van Heekeren & Firma Management Consultants bv, (2012) Evaluatie MIA en VAMIL 2005-2010, p. 25. Available at: https://www.rijksoverheid.nl/binaries/rijksoverheid/documenten/rapporten/2013/09/17/mia-vamil-evaluatierapport-2005-2010/mia-vamil-evaluatierapport-2005-2010.pdf.

[51] Frans Weekers, Brief betreft evaluatie EIA en MIA/VAMIL, 17th September 2013.

[52] Interview with a civil servant in charge of the MIA/Vamil scheme at the Netherlands Enterprise Agency, 19/09/2017, Brussels.

[53] https://webgate.ec.europa.eu/growth-portal/.

[54] http://ec.europa.eu/growth/tools-databases/nando/index.cfm?fuseaction=directive.notifiedbody&dir_id=25.

[55] Countries with which the EU has concluded Mutual Recognition Agreements (MRAs), Custom Union (CU) agreements and Protocols to the Europe Agreements on Conformity Assessment and Acceptance of Industrial Products (PECAs) have designated Notified Bodies, established per Directive.

Market Surveillance Authorities responsible for the OND are established in all Member States, plus Norway, Iceland, Switzerland and Turkey[56]. The list of MSAs is provided in the Annex.

The latest market surveillance sector report[57] covers the time period 2010-2013. Table 5-1 details the information as provided. No records were provided for Germany, Estonia, Ireland, Greece, Spain, Croatia, Cyprus, Lithuania, Luxembourg, the Netherlands or the Slovak Republic.

Some countries provided further information on the most typical irregularities. Reports from Bulgaria, Poland and Slovenia noted that the guaranteed sound power level is a common source of irregularity found during the inspections. Poland and Slovenia also note irregularities in the DoC. In Poland, issues were also experienced in deciding whether a specific appliance is subject to controls under OND market surveillance, i.e. too general definitions in Annex 1 gave rise to doubts as to whether specific appliances were to meet the requirements of these provisions.

Table 5-1: Total number of inspections and findings of non-compliance 2010-2013

		2010	2011	2012	2013
AT	No. of inspections				
	Findings of non-compliance	2			
BE	No. of inspections	130		64	11
BG	No. of inspections	48	266		236
CZ	No. of inspections	150	19	104	66
	Findings of non-compliance	19	31	22	11
DK	No. of inspections	4	4	0	0
IT	No. of inspections		54	164	186
LV	No. of inspections	6	53	14	32
	Findings of non-compliance	0	3	3	11
HU	No. of inspections	14	23	64	96
	Findings of non-compliance	4	21	32	23
MT	No. of inspections	0	0	0	0
PL	No. of inspections	394	398	371	384
	Findings of non-compliance	160	148	124	114
PT	No. of inspections	0	60	0	89
	Findings of non-compliance	0	28	0	11

[56] Based on information reported on the ICSMS database (https://webgate.ec.europa.eu/icsms/public/authoritySearch.jsp?locale=en) and the national programmes published at http://ec.europa.eu/growth/single-market/goods/building-blocks/market-surveillance/organisation_en.

[57] Review of market surveillance activities 2010 - 2013 - Sector 12 Noise emissions for outdoor equipment, available at: http://ec.europa.eu/DocsRoom/documents/13912/attachments/1/translations.

RO	No. of inspections	192	219	312	506
	Findings of non-compliance	15	11	18	14
SV	No. of inspections	115	35	90	38
	Findings of non-compliance	41	11	60	11
FI	No. of inspections	65	0	0	0
	Findings of non-compliance	50			
SE	No. of inspections		9	7	

Source: Review of market surveillance activities 2010 - 2013 - Sector 12 Noise emissions for outdoor equipment.

The Information and Communication System on Market Surveillance (ICSMS) database[58] serves as a portal through which MSA communicate the outcomes of their conformity processes. The 70 most recent entries related to products within the scope of the OND were analysed for this study. From 2016 to 2018, MSAs focused their control activities only on certain types of equipment.

- About 86% (n=60) of the MSA came from the UK[59];
- The conformity assessment process has been mainly carried out on Chainsaw and Power generators[60] with respectively 36% (n=25) and 23% (n=16) out of the 70 conformity sheets we reviewed.

A majority of the equipment reviewed was conform with the declaration of conformity issues and no issue was reported for the latter[61]. The main causes of non-conformity were the absence of a Declaration of Conformity (21%; n=15) followed by the presence of non-compliant Declaration of Incorporation[62] (16%; n=11)[63].

[58] https://webgate.ec.europa.eu/icsms/.
[59] The other countries of origin were: Belgium (1), Portugal (1), Poland (1), Germany (6). The Belgian did not indicate the type of equipment controlled.
[60] The remaining equipment covered were: Air compressors (n=10), Pressure washers (n=10), Tillers (n=5), High pressure jet machine (n=1), Lawnmower (n=1), Hedge trimmer (n=1) and Brush cutter (n=1).
[61] About 60% (n=42) of the 70 conformity sheets reviewed reported no issue about the product or the compliance documents.
[62] To date, the Declaration of Incorporation is not a requirement under the OND.
[63] Other causes of non-conformity were: the presence of a non-compliant Declaration of Conformity (n=4), the absence of DB label on the machine (n=1) and the difference between the information provided on the product and what is recorded (n=1).

Table 5-2: National transposition by country

Country	Overview of the legislation[64]	Transposition deadline
AT	Austria transposed the Outdoor Noise Directive into its legislative system in 2001 through the Ordinance of the Federal Minister of Economics and Labour on noise emissions from equipment and machines intended for outdoor use. This ordinance has then been amended in 2006 by the Ordinance of the Federal Minister of Economics and Labour amending the Ordinance of the Federal Minister of Economics and Labour on noise emissions from equipment and machines intended for outdoor use.	03/07/2001
BE	Belgium transposed the OND legislation through the Royal Decree of March 6th, 2002 regarding the sound power of equipment for use outdoors (with alterations). The Royal Decree regulates machines and tools which are used in residential zones and - as a consequence - can contribute to noise nuisance in the environment, regardless whether meant for professional or for private use.	03/07/2001
BG	Bulgaria transposed the OND even before it was a member of the EU through the Act on technical requirements for products in 2005 and the Ordinance on the essential requirements and conformity assessment of machinery and equipment, working outdoors, in terms of noise emitted by them in the air in 2006.	01/01/2007
CY	In Cyprus, Department of Labour Inspection is responsible for the enforcement of OND. The Essential Requirements (Noise Emission in the Environment by Equipment for Use Outdoors) Regulation have been in place since 2003.The national horizontal law on the enforcement of the New Approach Directives, has been continuously discussed and amendments are made when necessary.	01/05/2004
CZ	In the Czech Republic, there are several legislative acts connected to the transposition of the Directive. There is the Act No. 205/2002 Coll. which amends Act No. 22/1997 Coll. on technical requirements for products and on amendments and supplements to some acts as have been amended and to some other laws, the Act No. 258/2000 Coll. on protection of public health and amending certain related laws, and the Act No. 490/2009 Coll. amending certain laws in connection with the adoption of the Directive of the European Parliament and of the Council laying down the requirements for accreditation and market surveillance relating to the marketing of products. The Act No. 71/1967 Coll. on administrative proceedings (Administrative Code) and its amendments are also connected to the transposition of the OND. Then there are two government regulations that have a lesser legislative strength than	01/05/2004

[64] EUR-lex (2016). National laws implementing the Outdoor Noise Directive. Available at: http://eur-lex.europa.eu/search.html?type=advanced&qid=1485276990899&DN=72000L0014* [Last Accessed: 28/06/2018].

	the aforementioned acts, Government Regulation No. 291/2000 Coll. laying down graphic appearance of the CE marking and Government Regulation No. 198/2006 Coll. amending Government Regulation No. 9/2002 Coll. laying down technical requirements for products in terms of noise emission, as amended by Government Regulation No. 342/2003 Coll. Then, the Act No. 254/2003 Coll. amended the Act No. 264/1999 Coll. on Technical Requirements for Products and on Conformity Assessment and on Amendments to Certain Acts. Finally, the Government Decree No. 9/2002 Coll. was adopted in 2002 and it sets technical requirements for products in terms of noise emissions.	
DK	Denmark transposed OND already in 2001 through Order on noise from equipment for use in the open air and updated it in 2016 through Order on noise from equipment for use in the open. A Decree on noise from machines for use in the open air was also adopted on December 12, 2001.	03/07/2001
DE	Germany was one of the four MS that received in April 2002 a Reason Opinion from the European Commission to implement the OND properly. It has done so later that year through Regulation on the introduction of the Equipment and Machinery Noise Protection Ordinance of 29/08/2002 and Law on technical work equipment in the version of the notice of the new version of the Device Safety Law of 11/05/2001	03/07/2001
EE	In Estonia, the Ministry of Economic Affairs and Communication is the responsible contact point (Quality and Infrastructure Division), for the implementation of OND. The OND was transposed into national legislation through Requirements for equipment used outdoors by noise emission, noise measurement and noise in 2005.	01/05/2004
EL	Greece implemented the OND in 2003 through the Government Decision 37393/2028/GN/B/1418/1.10.2003 and the respective amendment of Article 8 in 2007.	03/07/2001
ES	In Spain the Ministry of Energy, Tourism and Digital Agenda is the responsible contact point for the implementation of the OND. The transposition of the OND took place in 2002 through the Royal Decree 212/2002 which regulates noise emissions in the environment by certain equipment for use outdoors BOE No 52 du 01/03/2002, page 8196.	03/07/2001
FI	Finland adopted OND into its legislation in 2001 through the Government regulation of the noise emitted by equipment used outdoors (621/2001). In addition, the Åland Islands (autonomous region in Finland) have adopted their own legislation on OND, Landscape Impact on environmental protection and the Ålands Act No. 30/2001 and Åland Government's decision on the application in the province of Åland regulation on noise equipment for use outdoors (AFS 72/2001). A decree on noise emissions from outdoor equipment was also adopted in 2011.	03/07/2001
FR	France transposed the OND through the Order of 18 March 2002 concerning noise emissions into the environment of equipment intended for use outside buildings.	03/07/2001
HR	As the newest member, Croatia adopted OND in 2013 through the Act on Protection against noise, the Act on Amendments to the Act on Noise Protection and Ordinance on measures for protection against noise sources	01/07/2013

	outdoors at the same time as their accession to the EU. Prior to that, Croatia has implemented a Law on Noise Protection (30/2009) in 2009. In 2013, a Law on Amendments to the Law on Noise Protection (55/2013) was voted.	
HU	The Department for Integrated Pollution Control of the Ministry for the Environment is the contact point for the implementation of the OND. The Directive has been transposed through Government Decree 140/2001 on the noise emission requirements for certain outdoor equipment and the certification of their conformity.[65]	
IE	The Environmental Protection Agency is responsible for noise related regulations and laws in Ireland. The transposition into national legislation took place in 2001 through the European Communities (Noise Emission by Equipment for Use Outdoors) Regulation 2001 SI n° 632 of 2001 of 19/12/2001.	03/07/2001
IT	Italy has, similarly to Germany, received a Reasoned Opinion from the EC in 2002 on the implementation of the OND. It has responded to the Opinion by adopting a Legislative Decree n° 262 September 4, 2002 - Implementation of Directive 2000/14/EC on noise emission by equipment for use outdoors.	03/07/2001
LT	Lithuania implemented the OND through the Order No. D1-652 of 29 December 2005 of the Environmental Minister of the Republic of Lithuania 'Order No. 325 of 30 June 2003 of the Minister for Environment on Construction and Technical Regulation STR 2:01:08:2003 "Outdoor Equipment for Use and Noise Control" – the Amendment'.	01/05/2004
LU	The Air and Noise Division of the Ministry of Environment is the responsible for the monitoring the implementation of the OND. The transposition into national legislation took place in 2001, through the Grand-Ducal Regulation of 21 December 2001 implementing 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 from equipment intended for use Outside buildings Grand-Ducal Memorial A n° 161 of 31/12/2001, page 3380.	03/07/2001
LV	The Ministry of Environmental Protection and Regional Development is responsible for monitoring OND implementation. The OND was transposed into national legislation through the Cabinet of Ministers Regulation No. 351 "Amendments to the Cabinet of Ministers of 23 April 2002 Regulations No 163" Regulations on noise emission by equipment used outdoors'. In 2004, the Cabinet of Ministers introduced the Regulation No. 351 "Amendments to the Cabinet of Ministers of 23 April 2002 and Regulations No 163" Regulations on noise emission by equipment used outdoors' ". In February 2006 there was an Amendment to the Cabinet of Ministers of 23 April 2002 Regulations No 163 "Regulations on noise emission by equipment used outdoors' which was followed by another	01/05/2004

[65] Budapest Főváros Kormányhivatala (2017). Gépek (MD) Kültéri berendezések zajkibocsátása (Zaj). Available at: http://mkeh.gov.hu/piacfelugyeleti_muszaki/Gepek_MD_Kulteri_berendezesek_zajkibocsatasa_Zaj.

	one, in August 2006: Amendments to the Cabinet of Ministers of 23 April 2002 Regulations No 163 "Regulations on noise emission by equipment used outdoors'.	
MT	The Technical Regulations Division within the Malta Competition and Consumer Affairs Authority is responsible for managing Noise Emission in the Environment by Equipment for Use Outdoors Regulations. The transposition of the OND took place in 2006 through the L.N. 58 of 2006 Product Safety Act (Act no. V of 2001) Noise Emission in the Environment by Equipment for Use Outdoors (Amendment) Regulations, in March 2006.	01/05/2004
NL	The Netherlands' legislative acts connected to the OND are a Decision of June 22, 2001, repealing the Decision on sound producing lawnmowers, Decision of 12 October 2001 establishing the effective date of the Decision of June 22, 2001, repealing the Decision on sound producing lawnmowers, Ordinance of August 29, 2001, on Sound emission control equipment, Ordinance on outdoor noise equipment, Withdrawal of the ordinance on sound producing equipment (Article 19, first paragraph of the Regulation on noise emissions from outdoor equipment), Ordinance of the State Secretary for Housing, Spatial Planning and the Environment of April 3, 2006, no. 200 651 319 LMV, amending the Regulation on noise emissions of outdoor equipment.	03/07/2001
PL	Poland has passed two acts and two ministerial regulations in order to comply with the OND, the Act of 30 August 2002 on Conformity assessment system, Regulation of the Minister of Economy of 21 December 2005 on essential requirements for equipment used outdoors in noise emission into the environment, the Act of 15 December 2006 on Amending the Act on conformity assessment system and amending certain other acts and Regulation of the Minister of Economy of 28 May 2007 on amending the Regulation on essential requirements for equipment used outdoors in noise emissions into the environment.	01/05/2004
PT	Portugal has also received a Reason Opinion from the European Commission on the proper implementation of the OND in 2002. It has reacted by adopting a Decree-Law 76/2002 that approves the Regulation of Sound Emissions for the Environment of Equipment for Use Abroad, transposing Directive 2001/14 / CEE of the European Parliament and of the Council of 8 May.	03/07/2001
RO	Romania has transposed the OND in its legislative system through Government Decision of 2006 GD. 1756/2006 on the limitation of noise emission in the environment by equipment for use outdoors. There was one more decision in 2007, Decision on the limitation of noise emission in the environment by equipment for use outdoors.	01/01/2007
SE	Since 2001, Sweden has applied the Ordinance (2001:1084) on Noise Emission by Certain Equipment for Outdoor Use implements Directive 2000/14/EC on Noise emission in the Environment by Equipment for Outdoor Use.	03/07/2001
SI	Slovenia had in place the Law on Technical Requirements for Products and Conformity Assessment since 1999. This was corrected by the correction regulation (1999-01-2796), in 2000. The transposition of the OND took place in 2005 through the Rules Amending the Rules on noise emission from machinery used outdoors.	01/05/2004

SK	Slovakia's legislative system addressed outdoor noise with the Act No. 264/1999 on technical requirements for products and conformity assessment and on change and amendment of certain acts of 27/10/1999. Eventually, Slovakia transposed the OND in its legislative system through Act No. 436/2001 Coll., Amending and supplementing Act No. 264/1999 Coll. on technical requirements for products and conformity assessment and amending certain laws in 2001. The Act No. 254/2003 Coll., Amending and supplementing Act No. 264/1999 Coll. on technical requirements for products and conformity assessment and amending certain laws as amended by Act No. 436/2001 Coll. was introduced in 2003.	01/05/2004
UK	The OND has been transposed into the United Kingdom's legislative system since 2001 through the Noise Emission in the Environment by Equipment for use Outdoors Regulations 2001 S.I. n° 1701 of 2001 (in force completely on 03/07/2001) and its consequent amendment, the Noise Emission in the Environment by Equipment for use Outdoors (Amendment) Regulations 2001 S.I. n° 3958 of 2001 (in force completely on 03/01/2002).	03/07/2001

To date, no infringement proceedings have been launched against any Member State regarding the transposition or implementation of the OND.

5.3. Current scope of the OND

The OND covers 57 types of equipment used outdoors, defined in Annex I. These types of equipment can be grouped into eight clusters as follows:

I. Cleaning equipment
- Combined high-pressure flushers and suction vehicles
- High-pressure flushers
- High-pressure water jet machines

II. Construction equipment
- Builders' hoists for the transport of goods
- Building site circular saw bench
- Building site band saw machine
- Compaction machines
- Concrete-breakers and picks, hand-held
- Concrete or mortar mixers
- Conveying and spraying machines for concrete and mortar
- Dozers
- Drill Rigs
- Dumpers
- Excavators, hydraulic or rope-operated
- Excavator-loaders
- Graders
- Hydraulic hammers
- Joint cutters
- Loaders
- Paver-finishers
- Piling equipment
- Paver-finishers
- Road-milling machines
- Trenchers
- Truck mixers

III. Gardening equipment
- Brush cutters
- Chain saws, portable
- Grass trimmers/grass edge trimmers
- Hedge trimmers
- Lawn trimmers/lawn edge trimmers
- Lawnmowers
- Leaf blowers
- Leaf collectors
- Motor hoes
- Scarifiers
- Shredders/chippers

IV. Loading and lifting equipment
- Aerial access platforms with combustion engine
- Construction winches
- Conveyor belts
- Equipment for loading and unloading silos or tanks on trucks
- Lift trucks, CE driven, counterbalanced
- Mobile cranes
- Tower cranes

- Pipelayers

V. Power generators and cooling equipment
  - Cooling equipment on vehicles
  - Power generators
  - Hydraulic power packs
  - Welding generators

VI. Pumping and suction equipment
  - Compressors
  - Suction vehicles
  - Water pump units

VII. Snowmobiles and snow groomers
  - Piste caterpillars
  - Snow-removing machines with rotating tools

VIII. Waste collection, processing and recycling.
  - Landfill compactors, loader-type with bucket
  - Glass recycling containers
  - Mobile waste containers
  - Power sweepers
  - Refuse collection vehicles

Together, they represent more than 26 thousand different models. Around 10 thousand models are subject to noise limits, while nearly 16 thousand are subject to noise labelling only.

The Directive covers equipment used by both professional and private users. In the cleaning, construction, loading and lifting equipment, power generators and cooling equipment, and waste collection, processing and recycling categories, the majority of equipment is used by **professional users only.** In gardening and pumping and suction equipment categories all types are used by **both professional and private users**. Typically, larger and more expensive equipment is used by professionals.

All large and professional equipment is likely to be subject to **public procurement**. When public authorities tender the service provider purchasing the equipment, other types of equipment may also be included.

5.4. An overview of the market for outdoor equipment

The number of the market operators in the sector was estimated based on desk research, the results of the CATI interviews, expert opinion and consultation with the sector organisations. It is estimated that between 500 and 600 manufacturing companies produce equipment covered by the OND. The findings are presented below according to the eight clusters mentioned above. The European fleet sizes are discussed in section 5.5.

Cleaning Industry

The cleaning machines sector is highly specialised and extremely export-oriented. The European turnover for the whole sector amounts to EUR 1.5 billion and the worldwide turnover to EUR 3.5 billion. Only part of this is relevant for equipment covered by the OND. European manufacturers hold a good position within the scope of international

competition, given the use of state of the art technology, excellent processing and the development of new areas of application[66].

Apart from manufacturing machines, the market delivers other types of services as well, including qualified consultation and customer care by the manufacturers, maintenance and repair, service and service-hotline, disposal/recycling of machines, used machines-trading, leasing/renting of machines and additional special services such as object consultancy[67].

There are approximately 30 EU manufacturers in this category. Considering that some companies produce multiple types of equipment, there are an estimated:

- Combined high-pressure flushers and suction vehicles: 10 manufacturers
- High-pressure flushers: 10 manufacturers
- High-pressure water jet machines: 15 manufacturers.

According to the ARCADIS Impact Assessment Report (2009), the EU market share of EU producers reached 75-80%. Although there are no foreign competitors on the EU market on high-pressure water jet machines, Asian competitors tend to sell other types of equipment in Europe at lower prices. Violation of intellectual property rights and non-compliance with EU regulation is a problem due to insufficient market surveillance[68].

Construction Machinery

The ARCADIS Impact Assessment Report (2009) estimated a sector annual turnover of about EURO 31 billion, not all of which is relevant to equipment covered by the OND. Two-thirds of which are earthmoving equipment. Concrete equipment (mixers and pumps) accounts for 10%, crushing and screening equipment for 7% of total turnover'[69].

The European construction equipment sector experienced a growth of 10% in 2016. The market for building construction equipment was at its highest in five years, and all sub-sectors within the industry experienced a growth in sales. However, the sector still has not recovered to the pre-crisis record levels, remaining one-third below the record levels seen in 2007[70].

The growth in 2016 was particularly driven by the market recovery in Russia, which together with France accounted for the highest growth rates. In Germany, the UK, and the Nordic countries the market levels were already close to their pre-crisis levels.

Despite the overall growth, the magnitude of it, as well as the profiles of market performance, varied significantly across the countries and regions. Disparities between

[66] Commission staff working document: Impact Assessment accompanying the document Proposal for a Directive of the European Parliament and of the Council amending Directive 2011/65/EU on the restriction of the use of certain hazardous substances in electrical and electronic equipment (SWD/2017/023 final - 2017/013 (COD));
EUnited Cleaning (2017). The Cleaning Industry. Available at: http://www.eu-nited.net/cleaning/commercial-cleaning-industrial-cleaning-commercial-cleaning-indu/index.html. Last accessed on 6/07/2017.

[67] Ibid.

[68] Van Acoleyen, M., Callebaut, K., Vöhringer, F., Franckx, L. Vermoote, S. and Van Herbruggen, B. (2009) ARCADIS - Impact Assessment Study on possible policy options for reviewing the Outdoor Equipment Noise Directive final report – European Commission DG Enterprise and Industry.

[69] http://ec.europa.eu/growth/content/impact-assessment-study-possible-policy-options-reviewing-outdoor-equipment-noise-0_en.

[70] CECE (2017). Annual Economic Report. Available at: https://cece.livapp3.livits.be/annual-economic-report.

Northern and Southern Europe remained a notable issue. This disparity is primarily caused by the growth in the Northern Europe at above-average rates. Currently, the market for the region is at historically high levels, while in Southern Europe the market recovery continues, but at a slower rate.

Globally, Europe was among the best-performing regions in 2016, thanks to a 10% market increase. At a global level, equipment sales recorded a 1% reduction overall. Consequently, European equipment sales outperformed the world market for the third consecutive year in 2016[71].

There are approximately 100 EU manufacturers in this category. Considering that some companies produce multiple types of equipment, there are an estimated:

- Builders' hoists for the transport of goods: 15 manufacturers
- Building site band saw machined: 20 manufacturers
- Building site circular saw benches: 10 manufacturers
- Compaction machines: 30 manufacturers
- Concrete or mortar mixers: 20 manufacturers
- Concrete-breakers and picks, hand-held: 10 manufacturers
- Conveying and spraying machines for concrete and mortar: 10 manufacturers
- Dozers (< 500 kW): 10 manufacturers
- Drill rigs: 15 manufacturers
- Dumpers (< 500 kW): 15 manufacturers
- Excavator-loaders (< 500 kW): 15 manufacturers
- Excavators, hydraulic or rope-operated (< 500 kW): 10 manufacturers
- Graders (< 500 kW): 5 manufacturers
- Hydraulic hammers: 20 manufacturers
- Joint cutters: 15 manufacturers
- Loaders (< 500 kW): 15 manufacturers
- Paver-finishers: 10 manufacturers
- Piling equipment: 10 manufacturers
- Road milling machines: 10 manufacturers
- Trenchers: 10 manufacturers
- Truck mixers: 20 manufacturers

Gardening Equipment

The bi-annual statistical survey carried out by the EGMF Marketing Committee shows sales of equipment exceeding 17.1 million units into the European Market (39 countries) in 2016. The respective number for 2015 was 17 million[72]. Data on sector turnover was not found, but given the sales number, it can be estimated to be in the billions[73].

Some of the individual equipment types in this category are produced in large numbers. As an example, there are 147 brands and 1,500 models of lawnmowers, and the estimated number of lawnmowers in the EU is at 125 million. About 4.5 million lawnmowers are sold annually, and sales for chainsaws, hedge trimmers and lawn trimmers also surpass the one million mark[74].

[71] Ibid.
[72] EGMF (2017). Activity Report 2017. Available at: https://www.egmf.org/wp-content/uploads/2016/05/EGMF-Activity-Report-2017-web.pdf.
[73] If an average cost per machine of EUR 200 is considered, the sector turnover is about EUR 3.5 billion.
[74] EGMF (2016). Activity Report 2015. Available at: https://onym.be/wp-content/uploads/2016/10/Rapport_EGMF_2015_web-1.pdf.

While all private garden owners are potential customers, commercial demand stems mainly from the agricultural sector, nurseries and large gardens. There is some demand also from rental companies. The ARCADIS study suggests that a large number of producers and customers indicate a highly competitive market, especially in conjunction with low price imports to the EU. Exports outside the EU, meanwhile, are not a major factor in the trade. The study also suggests that if market power is an issue in this sector, it can be connected to wholesale and retail companies. The noise limit complying companies face unfair competition from low price non-complying imports, as they are neither subject to market surveillance nor facing efficient punishment[75].

There are approximately 40 EU manufacturers in this category. Considering that some companies produce multiple types of equipment, there are estimated:

Approximately, there are:

- Brush cutters: 30 manufacturers
- Chain saws, portable: 15 manufacturers
- Grass trimmers/grass edge trimmers: 10 manufacturers
- Hedge trimmers: 15 manufacturers
- Lawn trimmers/lawn edge trimmers: 15 manufacturers
- Lawnmowers (excluding agricultural and forestry equipment, etc.): 20 manufacturers
- Leaf blowers: 20 manufacturers
- Leaf collectors: 20 manufacturers
- Motor hoes (< 3 kW): 10 manufacturers
- Scarifiers: 10 manufacturers
- Shredders/chippers: 30 manufacturers

Loading and Lifting Equipment

Most loading and lifting equipment types are expensive, with prices in Euro going into the 6 or 7-digit range. The ARCADIS study estimated the EU population for some equipment types, such as lift trucks and loaders, to be above 1 million. For all equipment types where turnover data was available on Prodcom (Builders' hoists for the transport of goods (combustion-engine driven), Builders' hoists for the transport of goods (with electric motor), Construction winches (with electric motor), Tower cranes, Portal cranes for harbours and terminals, Vehicle mounted loader cranes aerial access platforms, lift trucks, mobile cranes, and tower cranes), the total production value exceeded six billion in 2016.

There are producers of aerial access platforms in more than 10 European countries. EU producers amount to about 50% of EU sales[76]. For lift trucks, there are 14 manufacturers with a headquarter located in the EU that can be considered as SME according to the limit of EUR 50m turnover. EU producers have a market share of more than 75% in the EU. For mobile cranes, the European producers dominate the EU market with a market share of about 95%[77].

[75] Van Acoleyen, M., Callebaut, K., Vöhringer, F., Franckx, L. Vermoote, S. and Van Herbruggen, B. (2009) ARCADIS - Impact Assessment Study on possible policy options for reviewing the Outdoor Equipment Noise Directive final report – European Commission, DG Enterprise and Industry.
[76] Ibid.
[77] Ibid.

There are approximately 150 EU manufacturers in this category. Considering that some companies produce multiple types of equipment, there are estimated:

- Aerial access platforms with combustion engine: 30 manufacturers
- construction winches: 35 manufacturers
- Conveyor belts: 35 manufacturers
- Equipment for loading and unloading silos or tanks on trucks: 30 manufacturers
- Lift trucks, CE driven, counterbalanced: 35 manufacturers
- Mobile cranes : 35 manufacturers
- Pipelayers: 5 manufacturers
- Tower cranes: 20 manufacturers

Customers in this sector are predominantly commercial (construction, industry, infrastructure, rental companies). The ARCADIS study estimated exports to outside of the EU to be 50% for aerial access platforms, 20% for lift trucks, and 15-20% for mobile cranes. For aerial access platforms and lift trucks, Eastern Europe and China are important export markets, with 50% of aerial access platforms and 20% of lift trucks exported outside the EU. Exports of mobile cranes are mainly directed to the Americas and the Asia/Pacific region. Market power on the demand side was assumed to be low[78].

Power generators and cooling equipment

The ARCADIS study estimated the annual turnover to be somewhere between EUR 1- 2 billion. Direct employment was estimated to be 8,000 for cooling equipment on vehicles and 6,000 for power generators. The market for power generators/welding generators profits from growth in the construction market. A significant proportion of the production is exported outside the EU, mainly to the Middle East, Africa and East Asia[79].

There are approximately 75 EU manufacturers in this category. Considering that some companies produce multiple types of equipment, there are estimated:

- Cooling equipment on vehicles: 25 manufacturers
- Hydraulic power packs: 5 manufacturers
- Power generators: 35 manufacturers
- Welding generators: 10 manufacturers

For the smallest-sized products, there is foreign competition. The ARCADIS study found that the European suppliers cannot compete on price, having to sell on the quality of the product[80].

Pumping and suction equipment

There is little pre-existing information on the turnover in this sector. The ARCADIS study found that compressors have an estimated turnover of EUR 570 million[81]. According to the NOMEVAL report, the largest population number in this sector (1 million) is for water pumps. For most equipment types in this category, the EU market is still dominated by EU manufacturers. Compressors below 350 kW are produced in the UK, in France,

[78] Van Acoleyen, M., Callebaut, K., Vöhringer, F., Franckx, L. Vermoote, S. and Van Herbruggen, B. (2009) ARCADIS - Impact Assessment Study on possible policy options for reviewing the Outdoor Equipment Noise Directive final report – European Commission, DG Enterprise and Industry.
[79] Ibid.
[80] Ibid.
[81] Ibid.

Germany, Italy and Belgium. The turnover for all equipment covered by the OND could be estimated in around EURO 1 billion.

There are approximately 110 EU manufacturers in this category. Considering that some companies produce multiple types of equipment, there are estimated:

- Compressors (< 350 kW): 30 manufacturers
- Suction vehicles: 50 manufacturers
- Water pump units (not for use underwater): 55 manufactures

For suction vehicles as well as for combined high-pressure flushers & suction vehicles, the main customers are municipalities and regional authorities, and therefore demand depends to a large part on public budgets and tenders. The ARCADIS study found that drain maintenance is increasing in urban areas, as is the number of private contractors. Exports in units were found to be below 20% of total sales.

The most relevant export markets are North America, the CIS-states, and the Middle East, East Asia and Southeast Asia. The market for compressor below 350 kW is affected by developments in other sectors, especially crises in the US market and changes in the cost of raw materials and oil[82].

Snowmobiles and snow groomers

The worldwide snowmobile production of all manufacturers combined was 118,657 in 2017[83]. Approximately 15% of that was sold in Finland, Sweden and Norway.[84] The cost for a snowmobile ranges between EUR 10,000 and EUR 15,000. Considering an EU market of about 18,000 machines sold per year, the estimated annual turnover is about EUR 220 million. On top of this, ISMA estimates that the economic impact of snowmobile manufacturing and related businesses (services, development of trails, vehicle registration, etc.) create approximately EUR 5 billion annually across Sweden, Finland, Austria and Norway.

About 99% of the snowmobile sector is composed less of five companies. There is also one Russian based manufacturer, exporting snowmobiles to the EC market, using low-end technology[85]. In the EU, there are 9 manufacturers in this category, more specifically:

- Piste caterpillars: 1 manufacturer
- Snow-removing machines with rotating tools: 3 manufacturers

The ARCADIS study found that two European manufacturers hold more than 90% of the European market. According to the snowmobile industry, 29% of the snowmobiles are used for utility purposes and 71% for recreational purposes. The oligopolistic market structure suggests that the manufacturers should have some market power. Rental (safari) companies with fleets of hundreds of snowmobiles match this market power on the demand side. Snowmobiles face some competition from all-terrain vehicles.

[82] ARCADIS - Impact Assessment Study on possible policy options for reviewing the Outdoor Equipment Noise Directive final report – EC DG Enterprise and Industry – SI2.ACPROCE018014300 under Framework Contract no ENTR/04/093 Lot 5.
[83] ISMA (n.d.). Snowmobiling statistics and facts. Available at: http://www.snowmobile.org/snowmobiling-statistics-and-facts.html.
[84] ISMA (2017). Available at: http://snowmobile.org/.
[85] Ibid.

Nonetheless, substitution possibilities between all-terrain vehicles and snowmobiles are limited[86].

Waste collection, processing and recycling

The ARCADIS study estimated an annual turnover of about one billion. According to a research performed by Frost and Sullivan in 2016, the waste recycling bins market in Europe, has a market size of EUR 2.61 billion and is expected to grow – due to increased recycling - at a compound annual growth rate (CAGR) of 5% from 2016 to 2021[87]. As not all waste recycling bins fall under the scope of the OND, the sector turnover could be estimated somewhere in the middle between the two data.

There are approximately 50 EU manufacturers in this category. Considering that some companies produce multiple types of equipment, there are estimated:

- Glass recycling containers: 10 manufacturers
- Landfill compactors, loader-type with bucket (< 500 kW): 10 manufacturers
- Mobile waste containers: 30 manufacturers
- Power sweepers: 30 manufacturers
- Refuse collection vehicles: 30 manufacturers

The main customers are municipalities, many of whom have specific requirements for the equipment[88].

5.5. Overview of environmental impact

Environmental impact in the context of the OND can be defined as the effective noise levels (or their change due to regulation changes) for all people exposed to outdoor equipment noise.

The environmental indicator is a means to quantify this. It takes into account numbers of equipment fleets, source levels of the equipment, duration of noise and its characteristics.

Environmental noise results in annoyance and health effects for those exposed, and depending on all these factors. The environmental impact of the OND can be assessed by comparing the evolution of limit values since its introduction and the types of equipment added. They main assumption here is that real life noise emissions will reduce by the same amount as the limit reduction for the loudest part of the equipment stock, about the top 30% or less.

However, this effect rather depends at which level the initial limit for each equipment type was set, whether it affected many product models and to what extent. A very liberal limit obviously would have little effect on reducing real-world noise emissions.

The table below shows the limit values for equipment previously covered by separate Directives and those set by the OND and its amendment.

[86] Van Acoleyen, M., Callebaut, K., Vöhringer, F., Franckx, L. Vermoote, S. and Van Herbruggen, B. (2009) ARCADIS - Impact Assessment Study on possible policy options for reviewing the Outdoor Equipment Noise Directive final report – EC DG Enterprise and Industry.

[87] Frost & Sullivan (2016). Waste Recycling Bins Market in Europe. Available at: https://www.frost.com/sublib/display-report.do?id=MC08-01-00-00-00.

[88] Van Acoleyen, M., Callebaut, K., Vöhringer, F., Franckx, L. Vermoote, S. and Van Herbruggen, B. (2009) ARCADIS - Impact Assessment Study on possible policy options for reviewing the Outdoor Equipment Noise Directive final report – European Commission, DG Enterprise and Industry.

For the introduction of the OND, the limit reduction of most equipment already in previous Directives was effectively around 1-3 dB, except for lawnmowers, for which reductions were 0 dB. In the last amendment 2005/88/EEC, subsequent reductions between 2-3 dB were made, although only indicative for lawnmowers and medium-sized concrete breakers (see section 2.1).

New equipment introduced into the OND with limits (Article 12) was mainly several other types of construction equipment, mobile cranes, and lawn edge trimmers. In the 2005/88/EC amendment, these were given 3 dB lower limits, some of which were indicative.

A major change due to the OND was the introduction of Article 13 equipment without limits for which it is hard to estimate the impact on noise reductions over time due to lack of sufficient data. In addition, the data samples from year to year can differ due to the mix of models declared each year. In order to provide an estimate of the impact of the potential reduction of noise emission of equipment under Article 13, a reduction of about 1 dB is assumed. This is an overall reduction taking into account that there is some demand and competition for quieter equipment, although not for all equipment types and model ranges. Using data from the EC NOISE database the average declared values for the period 2000-2007 were compared with those for the period 2007-2015. This exercise was conducted tentatively on three types of equipment covered by Article 13. It found that the values increased for both chainsaws (by 1dB) and leaf blowers (by 3 dB), while they decreased for shredders (by 1dB). These results may be due to different factors. For example, an increase in power of this equipment may have led to an increase in noise emissions, which could be considered an effective standstill in noise emission. However, also the sample selection and the number of declarations received in specific years may affect the result. Estimates for equipment under Article 12 are more reliable as the limits force at least part of the equipment to produce lower noise levels.

For this reason, we provide separate estimations for reductions in noise level, environmental impact and monetisation of benefits.

For each subsequent change to the legislation, the environmental and health benefits can be derived from the effective noise reductions.

Table 5-3: Limit values established by subsequent legislation

Original Directive	Limit LWA	OND 2000/14/EC	2005/88/EC
84/533/EC - Compressors	Q ≤ 5: 100 5 < Q ≤10: 100 10 < Q ≤30: 102 Q > 30: 104	P ≤ 15 kW: 99 P > 15: 97 + 2 lg P	97 95 + 2 lg P
84/534/EC - Tower Cranes	100	98 + lg P	96 + lg P
84/535/EC - Welding Generators	I ≤ 200 A: 101 I > 200: 100	P_{el} ≤ 2 kW: 97 + lg P_{el} 2 < P_{el} ≤10: 98 + lg P_{el} P_{el}: > 10: 97 + lg P_{el}	95 + lg P_{el} 96 + lg P_{el} 95 + lg P_{el}
84/536/EC - Power Generators	P < 2 kVA: 102 P > 2: 100	P_{el} ≤ 2 kW: 97 + lg P_{el} 2 < P_{el} ≤10: 98 + lg P_{el} P_{el}: > 10: 97 + lg P_{el}	95 + lg P_{el} 96 + lg P_{el} 95 + lg P_{el}
84/537/EC - Concrete	m < 20 kg: 108 20 ≤ m ≤ 35: 111	m ≤ 15 kg: 107 15 < m < 30: 94 + 11	105 92 +11 lg m

breakers and picks	m > 35: 114	lg m m ≥ 30: 96 + 11 lg m	(indicative) 94 + 11 lg m
84/537/EC - Lawnmowers	L ≤ 50 cm: 96 50 <L ≤ 120: 100 L > 120: 105	L ≤ 50 cm: 96 50 < L ≤ 70:100 70 < L ≤ 120:100 L > 120: 105	94 (indicative) 98 98 (indicative) 103 (indicative)
86/662/EC - Hydraulic excavators, rope-operated excavators, dozers*, loaders* and excavator-loaders*	P ≤ 70 kW: 106 70 < P ≤ 160: 108 160 < P ≤ 350: 112/113* P > 350: 118	P ≤ 55 kW: 104 P > 55: 85 + 11 lg P	101 (indicative) 82 + 11 lg P (indicative)
Dumpers, graders, loader-type landfill compactors, combustion-engine driven counterbalanced lift trucks, mobile cranes, compaction machines (non-vibrating rollers), paver-finishers, hydraulic power packs		P ≤ 55 kW: 104 P > 55: 85 + 11 lg P	101 (indicative) 82 + 11 lg P (indicative)
Tracked dozers, tracked loaders, tracked excavator-loaders		P ≤ 55 kW: 106 P > 55: 87 + 11 lg P	103 (indicative) 84 + 11 lg P (indicative)
Compaction machines (vibrating rollers, vibratory plates, vibratory rammers)		P ≤ 8 kW: 108 8 < P ≤ 70: 109 P > 70: 89 + 11 lg P	105 (indicative) 106 (indicative) 86 + 11 lg P (indicative)
Excavators, builders' hoists for the transport of goods, construction winches, motor hoes		P ≤ 15 kW: 96 P > 15: 83 + 11 lg P	93 80 + 11 lg P

In Table 5-4 below, the estimated average effective noise reduction for the louder models of Article 12 equipment affected by the Directive is listed for several stages:

- just before the introduction of the OND in 2000 considering noise reductions due to the preceding Directives
- in 2006, before the amendment 2005/88 coming into force
- in 2017, 17 years after the introduction of the OND.

Reductions for Article 12 equipment are based on the limit changes. The reductions for a first step of noise limits are assumed relatively small as these are often chosen so as not to exclude too many equipment models. Reductions for individual models may be much higher, reducing excessive noise for some cases.

Table 5-4: Estimated effective noise reduction of loudest part of equipment stock due to the evolution of the OND Article 12 equipment and earlier Directives[89]

		Effective noise reduction on loudest equipment, dB			
Eq no.	Equipment name	Art. 12/13	Early Directives	OND 2000/14	OND 2005/88
3a	Builders' hoists for the transport of goods (combustion-engine d	12		1	3
8b	Compaction machines (only vibrating and non-vibrating rollers, v	12		1	3
9	Compressors (< 350 kW)	12	1	1	2
10	Concrete-breakers and picks, hand-held	12	1	1	2
12a	Construction winches (combustion-engine driven)	12		1	0
16	Dozers (< 500 kW)	12	1	2	3
18	Dumpers (< 500 kW)	12		1	3
20	Excavators, hydraulic or rope-operated (< 500 kW)	12	1	2	3
21	Excavator-loaders (< 500 kW)	12	1	2	3
23	Graders (< 500 kW)	12		1	3
29	Hydraulic power packs	12		1	3
31	Landfill compactors, loader-type with bucket (< 500 kW)	12		1	3
32	Lawnmowers (excluding agricultural and forestry equipment...)	12	1	0	0
33	Lawn trimmers lawn edge trimmers	12		1	0
36a	Lift trucks, CE driven, counterbalanced (rough terrain/constructi	12		1	3
37	Loaders (< 500 kW)	12	1	2	3
38	Mobile cranes	12		1	3
40	Motor hoes (< 3 kW)	12		1	3
41b	Paver-finishers (excl. paver-finishers with high-compaction scre	12		1	3
45a	Power generators (< 400 kW)	12	1	2	2
53	Tower cranes	12	1	1	2
57	Welding generators	12	1	1	2

Source: TNO calculations

Article 13 equipment is allocated a reduction due to its introduction and is more uncertain than for the Article 12 equipment. As mentioned, an overall reduction of 1 dB due to the Directive is assumed as set out in Table 5-5.

[89] Equipment from pre-OND Directives are marked green.

Table 5-5: Estimated effective noise reduction of loudest part of equipment stock due to the evolution of the OND Article 13 equipment

		Effective noise reduction on loudest equipment, dB		
Eq no.	Equipment name	Art. 12/13	OND 2000/14	OND 2005/88
1	Aerial access platforms with combustion engine	13	1	0
2	Brush cutters	13	1	0
3b	Builders' hoists for the transport of goods (with electric motor)	13	1	0
4	Building site band saw machine	13	1	0
5	Building site circular saw bench	13	1	0
6	Chain saws, portable	13	1	0
7	Combined high pressure flushers and suction vehicles	13	1	0
8a	Compaction machines (explosion rammers only)	13	1	0
11	Concrete or mortar mixers	13	1	0
12b	Construction winches (electrical motor)	13	1	0
13	Conveying and spraying machines for concrete and mortar	13	1	0
14	Conveyor belts	13	1	0
15	Cooling equipment on vehicles	13	1	0
17	Drill rigs	13	1	0
19	Equipment for loading and unloading silos or tanks on trucks	13	1	0
22	Glass recycling containers	13	1	0
24	Grass trimmers/grass edge trimmers	13	1	0
25	Hedge trimmers	13	1	0
26	High pressure flushers	13	1	0
27	High pressure water jet machines	13	1	0
28	Hydraulic hammers	13	1	0
30	Joint cutters	13	1	0
34	Leaf blowers	13	1	0
35	Leaf collectors	13	1	0
36b	Lift trucks, CE driven, couterbalanced (others excl. Container ha	13	1	0
39	Mobile waste containers	13	1	0
41a	Paver-finishers (equipped with a high-compaction screed)	13	1	0
42	Piling equipment	13	1	0
43	Pipelayers	13	1	0
44	Piste caterpillars	13	1	0
45b	Power generators (>_ 400 kW)	13	1	0
46	Power sweepers	13	1	0
47	Refuse collection vehicles	13	1	0
48	Road milling machines	13	1	0
49	Scarifiers	13	1	0
50	Shredders chippers	13	1	0
51	Snow-removing machines with rotating tools (self-propelled, exc	13	1	0
52	Suction vehicles	13	1	0
54	Trenchers	13	1	0
55	Truck mixers	13	1	0
56	Water pump units (not for use under water)	13	1	0

Source: TNO calculations

The environmental impact has been assessed in previous studies (NOMEVAL[90] and ODELIA[91]) with the so-called Environmental indicator EI, explained in more detail in the Annex. It was used to rank the various types of equipment taking into account their average noise emission levels, fleet numbers, operating times, sound characteristics and operating environments (see both reports). A high value of the EI implies high noise levels, large numbers of affected people, and/or large numbers of equipment. Values range at around 80 dB for the very highest EI levels for example for hydraulic hammers, down to 20 dB for the very lowest. The EI differs from the sound power level as it can be high for equipment types with moderate noise levels but with very large fleet numbers.

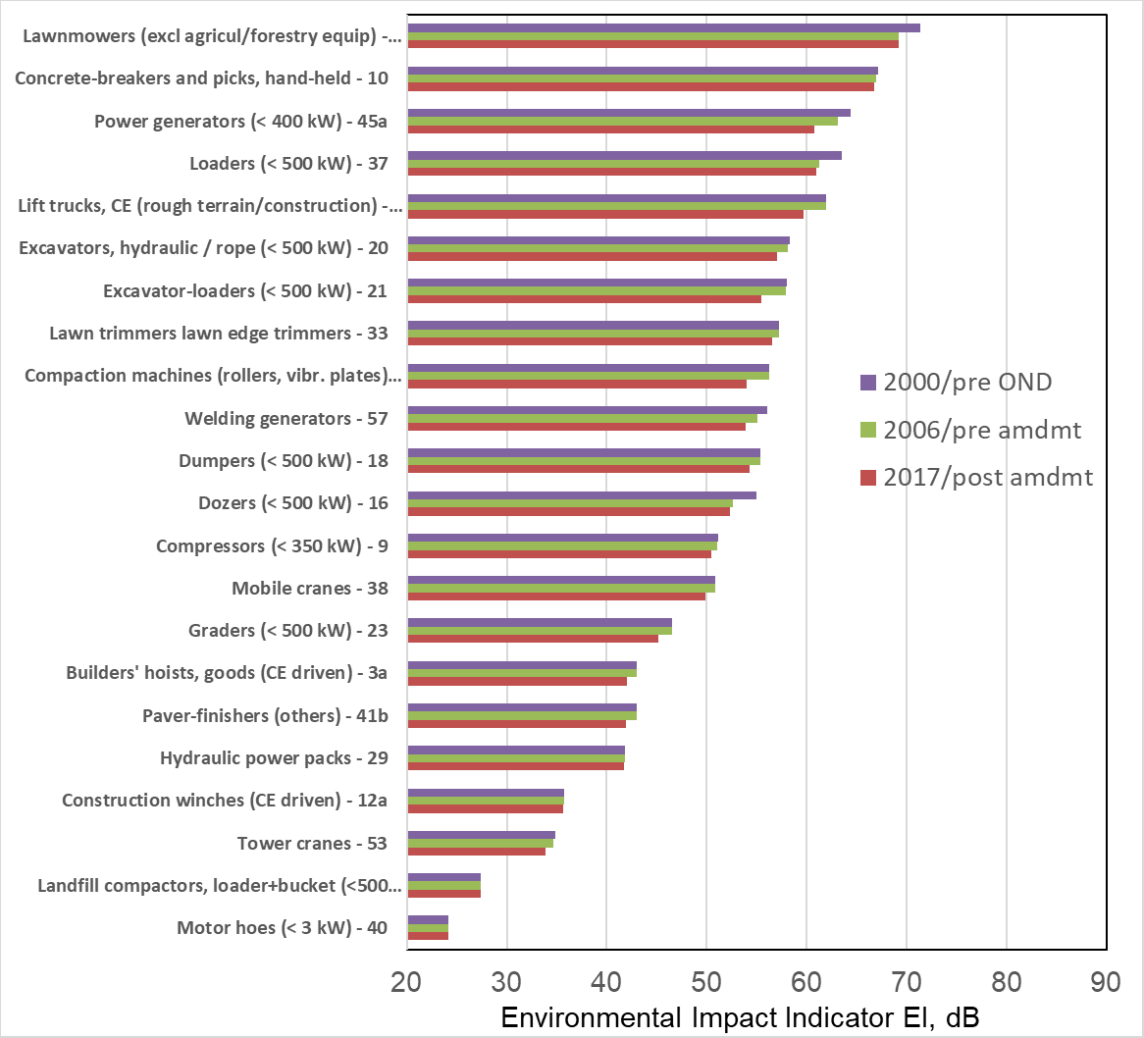
Estimates of the EI indicator are shown in Figure 5-2 for article 12 equipment and in Figure 5-3 for article 13 equipment. The changes in the EI level are mostly similar to the reduction of the sound power level. Any differences may be due to changes in numbers of affected people contained in the EI indicator.

The current values for the EI indicator are based on updated values of fleet numbers and operating times taking the latest information from industry associations into account. The current input values are also included in the Annex.

[90] Dittrich, M., de Roo, F., Gerretsen, E., Burgess, A. (TNO), Beckman, H.J., Spellerberg, G. (TÜV-Nord), Cellard, P. (LNE) and Bowker, A. (VCA) (2007). Study on the experience in the implementation and administration of Directive 2000/14/EC relating to the noise emission in the environment by equipment for use outdoors ("NOMEVAL") – Final Report. Available at: http://ec.europa.eu/DocsRoom/documents/1639/attachments/1/translations/en/renditions/pdf.

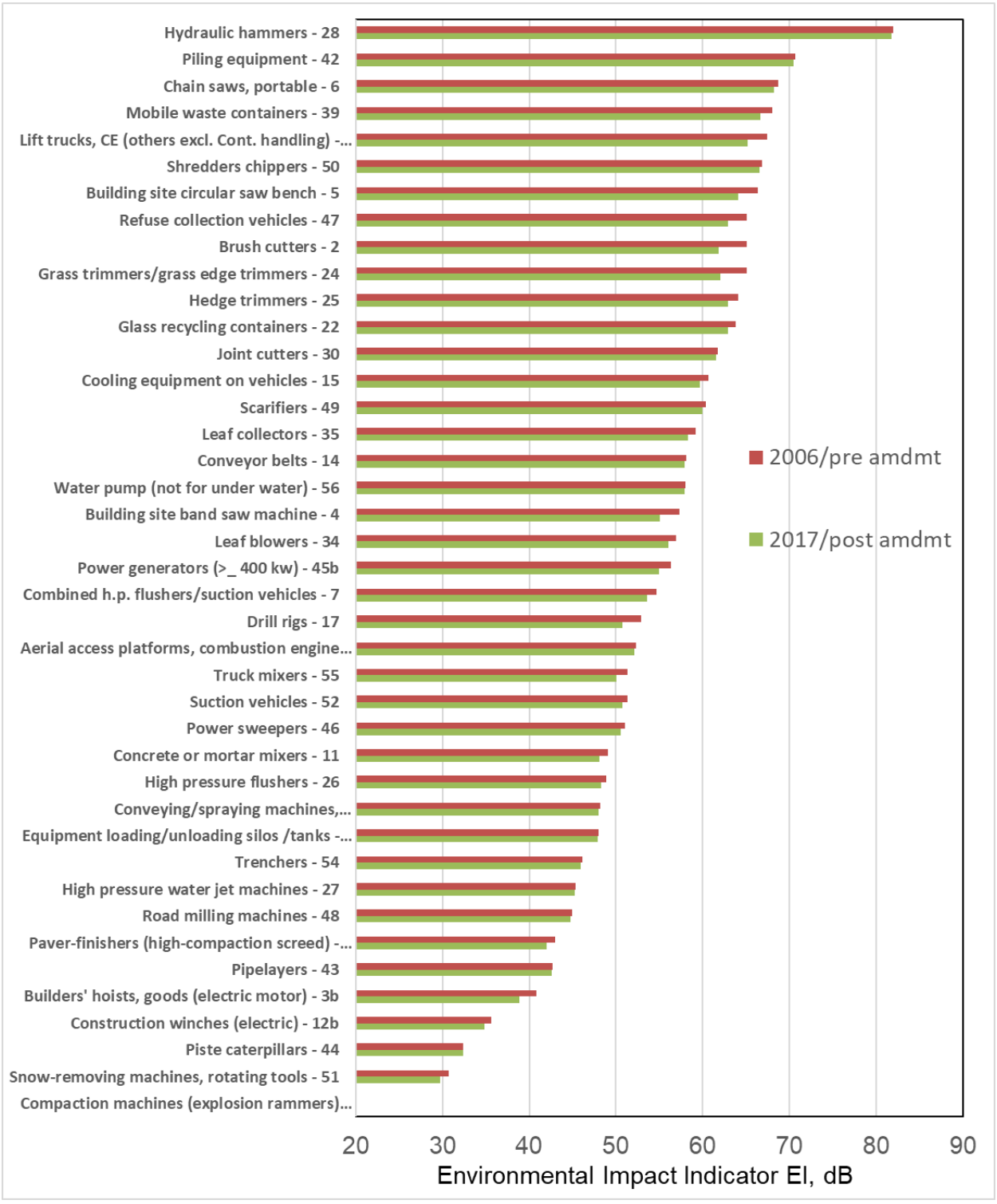
[91] Dittrich, M. (TNO), Spellerberg, G. (TÜV-Nord) Carletti, E. and Pedrielli, F. (IMAMOTER) (2016). Study on the suitability of the current scope and limit values of Directive 2000/14/EC relating to the noise emission in the environment by equipment for use outdoors ("ODELIA") – Final Report. European Commission, Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs. Available at: http://ec.europa.eu/DocsRoom/documents/18281/attachments/1/translations/.

Figure 5-2: Evolution of the Environmental impact indicator before and after the OND and its amendment coming into force, due to the development of limits, for Article 12 equipment



Source: TNO calculations

Figure 5-3: Evolution of the Environmental impact indicator before and after the OND and its amendment coming into force, due to development of limits, for Article 13 equipment



Source: TNO calculations

Monetised amenity and health benefits can be estimated in proportion to the effective noise reductions and numbers of people affected. This is done for the evaluation in the following, to estimate the monetised benefits of the OND since its introduction in 2000 up to 2017.

Socio-economic benefits of reduction of road traffic noise, in general, are mostly expressed in terms of reduced L_{DEN} and L_{night} noise levels, especially for long-term exposure. Annoyance is generally associated with the annual average L_{DEN} level at the dwelling facade (equivalent sound pressure level weighted for day-evening-night), whereas sleep disturbance and associated health effects on heart disease are linked with the night level L_{night}. As most outdoor equipment operates during the daytime (exceptions are sweepers, refuse vehicles, cooling equipment and power generators that may also operate at night), for the purpose of this study, only valuation of the reduction in the L_{DEN} due to the daytime noise level L_{day} is considered.

A 2003 European position paper recommends a valuation figure based on willingness to pay (e.g. the value people perceive) or Hedonic pricing (property value change) of €25 per household per annum per dB noise reduction in 2002.[92] This valuation is referred to as 'amenity' from here on and considered to be based on awareness of noise impact. It implicitly also includes some health effects. Taking actual averaged inflation for 2001-2017 into account of 1.97% (based on Eurostat HICP data) this figure is set at EUR 24.04 in 2000, EUR 33.50 in 2017 and EUR 35.52 in 2020. This is a fixed value for noise reduction independent of the actual noise level, as proposed in the EU position paper. In reality, the valuation may be much higher, so this approach actually gives a conservative estimate for benefits.

The annual benefit for amenity (due to reduced annoyance) B_A due to the operation of a single equipment unit is calculated from:

$$B_A = V_A * NH * NR$$

where V_A = benefit per household per dB noise reduction for amenity (including health), NH = number of households, NR = dB noise reduction of the average equivalent noise level L_{DEN} at the facade.

The valuation figure for noise reduction is actually a fixed value for noise reduction regardless of the absolute noise level, as suggested in the EU paper. It could be considered to apply a progressively increasing value with increasing absolute noise level, but this is not necessary as a higher noise level automatically affects more people over a larger range.

For outdoor equipment, there are no standard valuation method or dose-effect relationship for this. The large variety of outdoor equipment has strongly varying operating times, and conditions and no noise valuation methods or dose-effect relationships are available specifically for this source. Therefore, for this purpose, known valuation figures for health and amenity (linked to annoyance) for traffic noise are applied but adjusted for the fraction of operating time T_{op} in the whole year T_{total}:

$$V_{A,op} = V_A * T_{op}/T_{total}$$

[92] Valuation of noise - Position paper of the Working group on health and socio-economic aspects 4 December 2003, EU DG Environment, Brussels

So for example, if a gardening tool is working 5 hours per year and a noise reduction of 2 dB is applied, the amenity benefit B_A per household per equipment piece is calculated from:

$$B_A = V_{A,op} * NR * 5/(24h*365) = € 33.50 * 2 * 5/(24h*365)$$
$$= € 0.0382 /household/unit/year.$$

The number of affected households depends strongly on the noise level above a certain threshold, taken here at 55 dB(A), considering the potential effects of other sources and sound levels above which annoyance can be expected. This number can be estimated by taking an average population density within an area with sound pressure level of 55 dB(A) or higher. The number of affected households rises exponentially with the sound power level. So, a high sound power level will affect far more households than a low one.

Noise levels at the façade depend on the sound power level of the source, the distance between source and receiver, and propagation effects including reflections and barriers. The noise level can be calculated from the sound power level and the propagation terms as done for standard environmental calculations.

For the purpose of monetisation, a single average population density for residential areas of 504 persons per km^2 is chosen, based on the EU average. This will actually be larger in densely populated urban areas and smaller in rural areas.

The number of inhabitants per household is taken at 2.4 inhabitants per household as applied in other studies. (see Eurostat Household composition statistics, May 2018, data 2007-2017)

In one year, the benefits are proportional to the number of equipment types which are noise reduced, which increases each year as equipment is replaced by products that fulfil the new regulation. So, in the first year after coming into force, assuming a lifetime of 10 years, one-tenth of all equipment is assumed to be replaced, after five years half is replaced and so on, until after ten years, all equipment is replaced. The lifetime of ten years is an overall estimate for all equipment types, which may actually differ widely depending on the type and user: around 3 years for some consumer gardening equipment up to 20 years for some construction equipment.

In addition, the fraction of equipment which is actually affected by new limits is taken at 30% for each limit reduction step, as a proportion of equipment models may already be under the limit. This is for example the case for Brush cutters as shown in the ODELIA database analysis (see Annex C in the ODELIA study report).

The benefits each year are adjusted for the interest rate of 1.97% on the valuation figure. Then the accumulated benefits over a period of 20 years are calculated by adding the benefits in each year

The monetised benefits are presented in tables 5-6 and 5-7, for the benefits of limit changes between 2000 and 2017, separately for article 12 equipment and for article 13 equipment. For article 13 equipment, the results are less certain as the overall effective noise reduction due to introducing this for labelling only is considered to be around 1 dB.

Fleet numbers N, average sound power levels LWAgmean and usage are as listed in the Annex table A1, input data for the EI indicator, updated from ODELIA for this analysis. The noise reduction dLW is based on the limit changes for Article 12 equipment and on an estimated 1 dB reduction for Article 13 equipment. The number of affected households is calculated as described above and in the Annex/Methods.

The monetised benefits are for the given assumptions EUR 675 million for article 12 equipment and EUR 788 million for article 13 equipment, totalling EUR 1463 million, all accumulated over the whole 17-year period. Depending on uncertainties in the input variables, the monetised benefits can vary between around EUR 775 million and EUR 3804 million.

Table 5-6: Monetised amenity and health benefits of the OND over the period 2000-2017, Article 12 equipment[93].

Article 12 Equipment type	Nx1000	LWAgmean	hrs/y	dLW OND	Life yrs	Nhh	1y full ben.	Acc.ben.2017
Builders' hoists, goods (CE driven) - 3a	52	100,2	200	4	10	2,76	94579	1571031
Compaction machines (rollers, vibr. plates) - 8b	200	106	100	4	10	10,50	691499	11486334
Compressors (< 350 kW) - 9	2000	96	100	3	10	1,05	518624	8614750
Concrete-breakers and picks, hand-held - 10	420	105	200	3	10	8,34	1730223	28740345
Construction winches (CE driven) - 12a	26	97,2	150	1	10	1,38	4444	73817
Dozers (< 500 kW) - 16	15	107	800	5	10	13,22	652909	10845328
Dumpers (< 500 kW) - 18	30	106	800	4	10	10,50	829799	13783600
Excavators, hydraulic / rope (< 500 kW) - 20	726	99,5	400	5	10	2,35	2809753	46672177
Excavator-loaders (< 500 kW) - 21	170	100,8	800	5	10	3,17	1775049	29484947
Graders (< 500 kW) - 23	5	106,6	600	4	10	12,05	119092	1978211
Hydraulic power packs - 29	105	96,5	400	4	10	1,18	162934	2706454
Landfill compactors, loader+bucket (<500 kW) - 31	5	110,5	800	4	10	29,59	389782	6474577
Lawnmowers (excl agricul/forestry equip) - 32	66000	98,4	16	0	10	1,82	0	0
Lawn trimmers lawn edge trimmers - 33	18150	95,8	5	1	10	1,00	74911	1244337
Lift trucks, CE (rough terrain/construction) - 36a	236	104,7	800	4	10	7,78	4839087	80381003
Loaders (< 500 kW) - 37	342	102,6	800	5	10	4,80	5404899	89779573
Mobile cranes - 38	105	105,6	200	4	10	9,57	662187	10999444
Motor hoes (< 3 kW) - 40	1050	93	60	4	10	0,53	109170	1813393
Paver-finishers (others) - 41b	11	106,6	900	4	10	12,05	393004	6528097
Power generators (< 400 kW) - 45a	3000	94,4	2400	4	10	0,73	17222411	286077649
Tower cranes - 53	21	95,8	200	3	10	1,00	10401	172767
Welding generators - 57	1050	94,2	1200	3	10	0,69	2158705	35857767
				Totals			**40653460**	**675285604**

Source: TNO calculations

[93] N= equipment fleet, LWAgmean = mean guaranteed sound power level, hrs/y = operating time, Nhh = number of exposed households/unit, 1y full ben = benefits on average yearly basis, Acc.ben = accumulated benefits over period 2000-2017.

Table 5-7: Monetised amenity and health benefits of the OND over the period 2000-2017, Article 13 equipment[94]

Article 13 Equipment type	Nx1000	LWAgmean	hrs/y	dLW OND	Life yrs	Nhh	1y full ben.	Acc.ben.2017
Aerial access platforms, combustion engine - 1	94	102	600	1	10	4,18	194080	3223818
Brush cutters - 2	12000	110	5	1	10	26,37	1302725	21639274
Builders' hoists, goods (electric motor) - 3b	52	93	200	1	10	0,53	4505	74838
Building site band saw machine - 4	26	110	200	1	10	26,37	112903	1875404
Building site circular saw bench - 5	210	110	200	1	10	26,37	911907	15147492
Chain saws, portable - 6	25000	112	9	1	10	41,79	7742549	128609769
Combined h.p. flushers/suction vehicles - 7	50	111	400	1	10	33,20	546678	9080744
Compaction machines (explosion rammers) - 8a	0,001	104,2	100	1	10	6,94	1	9
Concrete or mortar mixers - 11	210	100	400	1	10	2,64	182381	3029498
Construction winches (electric) - 12b	26	92	150	1	10	0,42	1342	22292
Conveying/spraying machines, concr/mortar - 13	52	104	400	1	10	6,62	113440	1884321
Conveyor belts - 14	52	110,9	800	1	10	32,44	1111207	18458005
Cooling equipment on vehicles - 15	700	95	3600	1	10	0,83	1730223	28740345
Drill rigs - 17	30	107,6	400	1	10	15,17	149928	2490421
Equipment loading/unloading silos /tanks - 19	105	100	400	1	10	2,64	91191	1514749
Glass recycling containers - 22	1000	101	300	1	10	3,32	820017	13621116
Grass trimmers/grass edge trimmers - 24	18150	108,8	5	1	10	20,00	1494680	24827791
Hedge trimmers - 25	20000	106	5	1	10	10,50	864374	14357917
High pressure flushers - 26	53	108,4	100	1	10	18,24	79612	1322414
High pressure water jet machines - 27	1000	94,9	6	1	10	0,81	4026	66872
Hydraulic hammers - 28	420	123,7	87	1	10	618,14	18526904	307746288
Joint cutters - 30	53	110,6	400	1	10	30,28	528491	8778641
Leaf blowers - 34	5000	104,3	5	1	10	7,10	146097	2426786
Leaf collectors - 35	5000	107,3	5	1	10	14,16	291502	4842074
Lift trucks, CE (others excl. Cont. handling) - 36b	840	104,7	800	1	10	7,78	4305967	71525469
Mobile waste containers - 39	100000	96,8	2	1	10	1,26	207841	3452403
Paver-finishers (high-compaction screed) - 41a	11	106,6	900	1	10	12,05	98251	1632024
Piling equipment - 42	3	131,7	200	1	10	3900,22	1926871	32006832
Pipelayers - 43	10	108	200	1	10	16,64	27399	455115
Piste caterpillars - 44	5	109,1	600	1	10	21,43	52945	879453
Power generators (>_ 400 kw) - 45b	150	102	2400	1	10	4,18	1238808	20577563
Power sweepers - 46	32	100,3	960	1	10	2,83	71470	1187169
Refuse collection vehicles - 47	105	104,3	1440	1	10	7,10	883595	14677201
Road milling machines - 48	5	109,4	600	1	10	22,97	56731	942351
Scarifiers - 49	2730	99,5	4	1	10	2,35	21131	351006
Shredders chippers - 50	1440	108,5	8	1	10	18,67	177074	2941331
Snow-removing machines, rotating tools - 51	11	103,8	40	1	10	6,33	2292	38067
Suction vehicles - 52	34	107,8	100	1	10	15,89	44482	738874
Trenchers - 54	21	106,6	400	1	10	12,05	83364	1384748
Truck mixers - 55	48	111	80	1	10	33,20	104962	1743503
Water pump (not for under water) - 56	1050	108,1	80	1	10	17,03	1177554	19560084
				Totals			**47431497**	**787874072**

Source: TNO calculations

[94] N= equipment fleet, LWAgmean = mean guaranteed sound power level, hrs/y = operating time, Nhh = number of exposed households/unit, 1y full ben = benefits on average yearly basis, Acc.ben = accumulated benefits over period 2000-2017.

6. ANSWERS TO EVALUATION QUESTIONS

6.1. Effectiveness of the Directive

6.1.1. Did MSs implement the Directive in a coherent and effective way, ensuring common standards across the EU?

There is no evidence that national implementation of the OND, as discussed in section 5.2, presents significant issues. Indeed, none of the stakeholders consulted in this study reported any concerns about a lack of implementation. Stakeholder consultation and desk research also did not highlight the existence of national rules that could represent a challenge in this sense. About 67% of respondents to the OPC who expressed an opinion on this subject (n=67, N=100) agreed that the transposition was adequate and timely. The only reported issue came from Italy, where the national transposition of the Directive (D.lgs. 262/2002) requires including the reference to the Italian national legislation on the Declaration of Conformity (ref. Allegato II (Articolo 8) – 14th indent), while according to the OND Annex II, manufacturers must refer only to the European Directive 2000/14/EC. ISPRA, the Italian market surveillance authority for OND, has requested to some manufacturers to change their DoC according to the Italian transposition.

Although there is no legal obligation to establish Notified Bodies (NB) responsible for carrying out the conformity assessment as prescribed by the OND, they exist in most of the Member States (MS). Notified Bodies are private organisations appointed by the Member States on the basis criteria set by the Directive. Being private organisations, the NBs will be present in those countries where there is a sufficient number of companies producing equipment covered by the OND (see section 6.1.9).

As discussed in section 5.2, there are currently no dedicated NBs in Cyprus, Estonia, Greece, Ireland, Lithuania, Malta, Portugal or Spain. Since Notified Bodies conduct the measurements established by the OND, the lack of such bodies in some MS represents a challenge for manufacturers who need to seek the required expertise from the NB in another Member State (see section 6.2.2 for the discussion on costs of involving Notified Bodies).

Most stakeholders recognise that the Directive has prevented the potential proliferation of different national standards and regulations, therefore allowing companies to sell their products across Europe. This was also confirmed by the results of the public consultation, where about 80% of respondents (n=120) indicated that "the Directive has ensured harmonisation of rules and procedures across the EU for the covered outdoor equipment".

6.1.2. Were noise levels of outdoor equipment reduced thanks to the Directive? Were Noise levels of equipment under Article 13 (not subject to permissible sound power levels) also reduced thanks to the Directive?

Noise emission levels of outdoor equipment have dropped over the last 20 years, and most stakeholders recognise the positive role played by the OND (almost 75% of the respondents to the public consultation recognised a positive effect of the OND on Noise performance of equipment, n=113 64%, n=96, attributed the

reduction of noise levels to the OND in particular in relation to noise produced by equipment covered by Article 12[95]).

As mentioned in section 4.7, there are important limitations in terms of data availability. Information on noise emission levels before the OND was introduced is not available for the equipment covered, in particular for equipment covered by Article 13.

As discussed in section 5, the OND merged existing legislation (seven product Directives and two procedure Directives) updating the noise emission limits of the following types of equipment:

- Compressors;
- Concrete breakers;
- Construction plant equipment;
- Hydraulic excavators;
- Lawnmowers;
- Power generators;
- Tower cranes;
- Welding generators.

The limits set by existing legislation provide a pre-OND picture for the above-listed equipment allowing a comparison between the noise limits established by the previous legislation and the OND. **The limit reduction of most equipment already in previous Directives was effectively around 1-3 dB,** except for lawnmowers, for which reductions were 0 dB. In the last amendment 2005/88/EEC, subsequent reductions between 2-3 dB were made, although only indicative for lawnmowers and medium-sized concrete breakers (see section 5.5).

For equipment not covered by any previous legislation, it is more difficult to provide an indication of how noise emissions have changed. New equipment introduced into the OND with limits (Article 12) was mainly several other types of construction equipment, mobile cranes, and lawn-edge trimmers. For some of this equipment,[96] while pre-OND data is not available, new lower limits were established in the 2005/88 amendment. On the basis of these, **a noise reduction of at least 3 dB is estimated for equipment under Article 12 not covered by previous legislation**.

Article 13 of the Directive establishes a marking obligation for 34 types of equipment. The purpose of this provision is, on the one hand, to inform the consumers about the level of noise emissions of the products, encouraging a 'buy quiet' attitude and on the other hand to force manufacturers to compete also on this specific feature.

Whether this provision helped to reduce noise levels of the equipment covered is not easy to establish due to a lack of relevant and comparable data.

The NOMEVAL and ODELIA studies provide minimum, maximum and average declared values. However it is not possible to compare the results reported in the two studies

[95] A smaller percentage (43%, n=65) recognised that 'noise emissions by outdoor equipment subject to noise marking only (Article 13) have been reduced thanks to Directive 2000/14/EC'

[96] Dumpers, graders, loader-type landfill compactors, combustion-engine driven counterbalanced lift trucks, mobile cranes, compaction machines (non-vibrating rollers), paver-finishers, hydraulic power packs. Tracked dozers, tracked loaders, tracked excavator-loaders. Compaction machines (vibrating rollers, vibratory plates, vibratory rammers). Excavators, builders' hoists for the transport of goods, construction winches, motor hoes.

due to the different methodology and datasets used (in particular, the ODELIA study used a much larger data sample based on different databases).

Using data from the EC Noise database the average declared values for the period 2000-2007 were compared with those for the period 2007-2015. This exercise was conducted tentatively on three types of equipment covered by Article 13. It found that the values increased for both chainsaws (by 1dB) and leaf blowers (by 3 dB), while they decreased for shredders (by 1dB)[97]. These results may be due to different factors. For example, an increase in power of this equipment may have led to an increase in noise emissions. However, also the sample selection and the number of declarations received in specific years may affect the result.

The general opinion expressed by stakeholders consulted for this study is that the **inclusion of equipment under Article 13 was not sufficient to encourage manufacturers to develop less noisy products to the extent of Article 12.** At the same time, the lack of awareness and knowledge among consumers about the meaning of the label and how to correctly interpret it (see section 6.1.4) did not allow the provision to achieve its intended objective.

6.1.3. Were noise levels of outdoor equipment reduced by the extent to have an impact on the health and well-being of citizens?

The OND plays a role in protecting the health and well-being of citizens and the environment by reducing permissible noise levels of outdoor equipment. As discussed in section 6.1.2, emission levels of outdoor equipment have dropped over the last years. Respondents to the public consultation supported this view (73%, n=109). However, whether noise levels have reduced to the extent to be safe for the health and well-being of citizens, is difficult to evaluate.

There are several studies that assessed the impact of noise emissions on health, and **while exposure to noise is inevitable, it can have detrimental effects on human health, amenity, productivity and natural environment**[98], in particular for a longer duration. Learning and memory start to be affected at 50 dB, sleep at 42 dB (self-reported) or 32 dB (detected in polysomnography). Blood pressure increases at 50 dB. Noise can already be disturbing or annoying at 42 dB, affecting wellbeing[99]. Talking in a noisy environment stresses vocal cords and causes hoarseness[100].

[97] Chainsaws: increased from 108,6 up to 109 dB. Leaf blowers: increased, from 104,9 up to 108,1 dB(A). Shredders: reduced, from 109,5 dBA down to 108,5 dB(A).

[98] UK Department for Environment, Food & Rural Affairs (DEFRA) (2014). Environmental Noise: Valuing impacts on: sleep disturbance, annoyance, hypertension, productivity and quiet. Available at: http://www.programmeofficers.co.uk/Cuadrilla/Inquiry/CUA/CUA_INQ14.pdf.

[99] NCTC (2010). Activities of the CAETS Noise Control Technology Committee. Available at: http://www.aph.gov.au/DocumentStore.ashx?id=c174eb07-244e-4bd1-8bef-364efdd1776d; Haahla, A. and Heinonen-Guzejev, M. (2012). Melun terveysvaikutukset ja ympäristömelun häiritsevyys. Available at: https://www.researchgate.net/publication/249963228; Työsuojeluhallinto (2013). Työmelu. Available at: https://www.tyosuojelu.fi/documents/14660/2426906/Ty%C3%B6melu_TSO_2.pdf/2981f3f9-8a0d-4b5f-bf5b-4efc334c3c1c?version=1.0; Pelkmans, J., Correia de Brito, A., Griner, A. and Luchetta, G. (2014) study on the merger of the Directive on Noise from Outdoor Equipment, 2000/14/EC, with the Machinery Directive, 2006/42/EC (including an evaluation of Directive 2000/14/EC) - final report. Available at: http://ec.europa.eu/DocsRoom/documents/4985/attachments/1/translations; Freiermuth, A. (2017). Lärm macht krank und kostet Milliarden. Available at: https://www.migrosmagazin.ch/archiv/laerm-macht-krank-und-kostet-milliarden.

[100] Haahla, A. and M. Heinonen-Guzejev (2012). Melun terveysvaikutukset ja ympäristömelun häiritsevyys. Available at: https://www.researchgate.net/publication/249963228_Melun_terveysvaikutukset_ja_ymparistomelun_hairitsevyys.

According to King and Davis (2003), most evidence suggests that at an equivalent continuous sound level (LAeq)[101] of 24h of less than 70 dB does not lead to any permanent hearing loss. However, the LAeq value of more than 80 dB(A) is the limit above which preventive noise reduction measures should be taken in the workplace.[102] Hearing damage may occur when exposed to LAeq noise levels between 90 and 130 dB (A), or at lower levels but with prolonged exposure. In addition to hearing loss, it can generate extensive collateral damage, such as stress, increased heart rate, blood pressure, respiratory rate, vascular tone, gastric secretion, sweating, muscle tone, and pupil size[103].

Therefore, **while sounds higher than 90 dB sound pressure level are considered dangerous to hearing and general health, already noise above 50 dB sound pressure level can have impacts on the wellbeing of people exposed** (e.g. sleep disturbance), and on the longer terms potentially lead to more serious health effects.

Lower noises from machines used for a shorter period of time (e.g. gardening equipment) can still have an impact on wellbeing, annoyance and stress effects (see Section 6.3.1).

The OND establishes sound power limits and the resulting sound pressure level depends on the distance. Also, the equivalent sound level LAeq over a longer period may be lower if operating conditions are considered. The sound pressure to which a bystander or observer could be exposed is calculated as follows depending on the distance from the noise source:

- sound power level minus 26 dB for 7.5m distance
- sound power level minus 37 dB for 25m distance.

With this in mind, most of the types of equipment covered by the OND are above 92 dB sound power level, ranging up to 120 dB for the noisiest.[104] Considering the distance, an observer could be exposed to sound pressure levels ranging between 66 dB and 94 dB at 7.5 metres and 55 dB and 83 dB at 25 metres. Both ranges exceed the guard levels mentioned above indicating that the noise emissions of the equipment covered by the Directive still have the potential to have long-term negative effects on health.

The key source of data with regards to the evolution of noise emission would be the NOISE Database managed by the European Commission. Despite the mentioned limitations (see section 4.7 and 6.1.11), the ODELIA study analysed data contained in this and other databases[105]. On the basis of this analysis, the study identified types of outdoor equipment for which current noise limits are still adequate and suggested a revision for a number of them. While the recommendations contained in the study were based on several factors (e.g. the assumed exposure to certain noise emissions), it also took into account the technological development of the equipment covered. The

[101] 'LAeq is the sound level in decibels equivalent to the total A-weighted sound energy measured over a stated period of time.' Gracey & Associates. Leq, LAeq, Equivalent Continuous Sound Level: Definitions, Terms, Units, Measurements... Acoustic Glossary. Available at: http://www.acoustic-glossary.co.uk/leq.htm.

[102] Druteliené, G. and R. Butkus (2016). Investigation of noise exposure and particulate matter concentration in wood processing companies. Available at: http://sauga.asu.lt/wp-content/uploads/sites/8/2016/05/9-12_Druteliene_I_sekc_27.pdf.

[103] Colantini, A. and F. Mazzocchi, F. Cossio, M. Cecchini, R. Bedini, D. Monarca (2016). Internal combustion engine chainsaws: performance and safety. Available at: http://www.m-hikari.com/ces/ces2016/ces25-28-2016/p/colantoniCES25-28-2016-1.pdf.

[104] Based on the current noise limits set by Article 12 and the findings of the ODELIA study.

[105] ISPRA (MARA, Italy) and NPRO (UK).

study found that of the 22 types of equipment covered by Article 12, it was possible to propose new limits for eight of them[106], indicating that, for these types of equipment, solutions for lower noise emissions are available. The new limits suggested by the ODELIA study mostly do not represent state of the art for the related types of equipment, as for many types some quieter versions are available on the market, but not widespread (e.g. due to patents). The proposed changes affect mainly the highest sound power levels leaving the lowest ones almost unchanged. This would imply that noise emissions of outdoor equipment on the market have not or cannot yet be reduced by the extent needed to be below the level that is deemed safe for people exposed.

However, **since emission levels of outdoor equipment have dropped over the last years also thanks to the OND, it can be concluded that citizens exposed to them are better off now than they would have been without the OND. However, they may still be exposed to harmful noise emissions**.

6.1.4. Did the Directive raise awareness among consumers encouraging a 'buy quiet' attitude?

The OND provisions are not sufficient to motivate consumers to buy equipment producing lower noise. The OND establishes a marking obligation to inform consumers and raise awareness about noise emissions of outdoor equipment. The ultimate goal is to encourage them to prefer quieter machinery over noisier alternatives.

There are different factors that impact consumer choice and hinder the OND in reaching its objective in this area:

First, non-professional purchasers and users of the equipment under the scope of the Directive lack knowledge and awareness about noise emissions. This is widely agreed by all stakeholders reached and documented in the literature.[107] As a consequence, the average consumer does not have a clear understanding of the noise unit measure (dB) used for the noise marking established by the OND. Through the OPC, users of outdoor equipment (83%, n=10) mentioned considering the current label moderately clear to not clear at all.

Second, there seems to be a general expectation among consumers that the types of products covered by the OND are noisy and that similar products are equally noisy. Stakeholders consulted pointed out that the type of equipment covered by the OND is generally known to be noisy and consumers may pay less attention to this characteristic assuming that no perceivable differences exist between noise emissions of similar machinery.

Third, the current marking requires a proactive attitude by the consumer to compare different products in order to identify the most noise efficient one. However, the preconception that similar equipment will be equally noisy and the lack of at least a basic understanding of what a 1 or 2 dB difference concretely means are not favourable conditions for this to happen. Although respondents to the public

[106] Compaction machines (only vibrating and non-vibrating rollers, vibratory plates and vibratory rammers); Concrete-breakers and picks, hand-held; Lift trucks, CE driven, counterbalanced (excluding 'other counterbalanced…); Lawnmowers (excluding agricultural and forestry equipment, …); Lawn trimmers/lawn edge trimmers; Mobile cranes; Power generators (< 400 kW); Welding generators.

[107] Carletti, E. and F. Pedrielli (2016). Outdoor machinery: a reliable statistical approach for a new noise labelling based on current noise emission marking data. Available at: https://www.iiav.org/archives_icsv_last/2016_icsv23/content/papers/papers/full_paper_106_20160314103705778.pdf; Brereton, P. and J. Patel (2016). Buy quiet as a means of reducing workplace noise. Available at: https://core.ac.uk/download/pdf/81712329.pdf.

consultation recognised that the OND improved the level of information provided to consumers and users (51%, n=76), stakeholders also generally agree that the current noise marking is seen as not easy to read and use for the average consumer.

Figure 6-1: Current Noise emission label

Rather than noise emissions, general performance seems to be the key criterion considered, followed by energy efficiency, safety and price. All stakeholders agreed that noise emissions for outdoor equipment are rarely considered.[108] Users who responded to the OPC also mentioned that while they tend to consider noise emission levels when buying or renting outdoor equipment, they prefer quieter equipment only if it offers similar features / performances to other noisier alternatives. Interestingly, the **noise emission level seems to play a more important role than weight and aesthetics**[109]. Further, while price remains one of the key drivers of consumer choice, respondents indicated that, on average, they would be prepared to pay up to 12% more for quieter equipment[110].

Confirming that noise emission levels are still a low importance purchasing criterion, only a fifth of the rental organisations (n=74) that replied to the CATI interviews reported offering noise emissions among the research criteria on their website.

However, while noise emissions in general tend to be a secondary purchasing criterion, **the type of customer affects the relative importance of the product features**. For instance, casual or leisure consumers tend to be more focused on the price, while professional users aim to buy high-performance equipment that allows them to complete the job in the shortest amount of time possible. Public authorities, local ones in particular, may on the contrary be more interested in low noise equipment for machines employed during night time or early in the morning (e.g. street cleaning machines)[111].

Manufacturers and rental companies reported that demand for quieter equipment is greater among public purchasers (33%) than among private or professional users (22% and 20% respectively) (see Table 6-1 below). This appears to be particularly

[108] Although the response rate to the public consultation from users of outdoor equipment was low, data collected still gives an indication of the main purchasing criteria. The information provided concerns mostly Gardening equipment. Respondents also mentioned to buy Construction and Cleaning equipment. No answers were provided for Loading and lifting equipment and Waste collection, processing and recycling equipment.

[109] While this was confirmed by all consumer organisations interviewed, also the low participation rate of consumer organisations to the interview process of this study seems to indicate a low interest in this specific issue. About one hundred organisations were contacted in the scope of the study, and while only a few agreed to be interviewed, about half reported of not working on the topic at hand and could not provide useful insights. This view was confirmed by the findings of the study: Pelkmans, J., Correia de Brito, A., Griner, A. and Luchetta, G. (2014) study on the merger of the Directive on Noise from Outdoor Equipment, 2000/14/EC, with the Machinery Directive, 2006/42/EC (including an evaluation of Directive 2000/14/EC) - final report. Available at: http://ec.europa.eu/DocsRoom/documents/4985/attachments/1/translations.

[110] In interpreting the figure, it should be noted that willingness to pay (WTP) for hypothetical scenarios can be influenced by hypothetical bias (HB), wherein the respondent gives a higher value than what they would in fact be willing to pay in a real-life situation (see for example Loomis, 2014). Therefore, we can assume that the actual percentage consumers would be prepared to pay is below 12%.

[111] This was confirmed by interviewees and respondents to CATI survey.

relevant for equipment used for cleaning and waste collection services (for which up to 91% of manufacturers recognised a moderate to large demand). This was further confirmed by the manufacturers that replied to the public consultation. They indicated that while information about noise emission is provided to customers mostly in all sectors, this is usually required by customers only for cleaning and waste collection, processing and recycling equipment. Respondents indicated that stronger demand for silent products exists also for power generators and cooling equipment. Power generators are often used in specific contexts where excessive noise can be problematic. This is the case for example of movie sets where power generators are used while filming, hence the need for more silent equipment.

Table 6-1: Demand for quieter equipment from different categories of customers

	Not at all / to a small extent	To a moderate extent	To a large / very large extent	Total	Total respondents
For business	48%	30%	20%	100%	479
For consumers	42%	34%	22%	100%	226
For public authorities	34%	28%	33%	100%	183

Source: CATI interviews

6.1.5. Have non-certified products reached the market? If so, were they identified, and their commercialisation blocked? How has the number of non-compliant equipment, or notifications of it, changed since 2007? Have MSs established appropriate authorities and measures to ensure conformity of relevant equipment?

Market surveillance is the cornerstone of the OND and at the same time one of the key issues of the current legislative framework. In order for the Directive to reach its objectives, there is a need for effective and comprehensive enforcement that safeguards the interests of both consumers and manufacturers that produce conform equipment.

Complying with the requirements of the OND poses a burden on manufacturers as resources need to be allocated to the reduction of noise emission, measurements, and conformity assessment. While these costs may be deemed acceptable when applied to everyone and enforced equally, **gaps in market surveillance would undermine the level playing field, putting compliant manufacturers at a competitive disadvantage compared with those who ignore the legislation** (see sections 6.1.5 and 6.1.11)[112].

While MSAs are established in all Member States, only a small share of them is responsible for outdoor equipment compliance with the OND. Out of the about 800 MSAs established in the EU Member States, only 91 are responsible for

[112] Pelkmans, J., Correia de Brito, A., Griner, A. and Luchetta, G. (2014) study on the merger of the Directive on Noise from Outdoor Equipment, 2000/14/EC, with the Machinery Directive, 2006/42/EC (including an evaluation of Directive 2000/14/EC) - final report. Available at: http://ec.europa.eu/DocsRoom/documents/4985/attachments/1/translations.

compliance with the OND (against for example the 233 in charge of compliance with the Machinery Directive)[113].

This lower number of dedicated MSAs can be explained by several factors. Noise emission measurement is an extremely technical procedure, and specific training should be provided to responsible authorities. In this regard, it makes sense for some MSs to focus expertise in fewer authorities so that they use their resources more efficiently. However, all stakeholders consulted for the study agreed that the **current resources (human and economic) allocated to national MSAs are not sufficient** to allow for effective enforcement of the OND[114]. In particular, it was highlighted that additional resources should be made available to provide adequate training to Market Surveillance Officers[115].

Put together, the low number of designated MSAs and the insufficient resources allocated specifically to the training and enforcement of the OND may indicate that compliance with the requirements established by the OND is not a priority in most Member States. On the basis of Article 9 of the OND, a Member State that ascertains the existence of non-compliant equipment on the market has to act to have the manufacturer or their authorised representative bring the equipment into conformity. In the event of the limit values referred to in Article 12 being exceeded, or non-compliance with other provisions continuing, the MS must act to restrict or prohibit the marketing of the product. In this case, the MS must also inform the European Commission that, in turn, will verify that the measures taken are justified. To date, no Member States has ever notified to the European Commission to have undertaken an action against products that are not compliant with the OND.

The Information and Communication System for Market Surveillance (ICSMS) is a platform used by MSA to exchange information on products covered by EU legislation aligned to the New legislative framework. Under this system, the Member States that identify a non-compliant product on the market need to notify the action taken on the ICSMS. The other MSs have three months to react to this action. If no MS react, the action is considered legitimate, if an MS contests it, the EC starts an investigation procedure.

Not being aligned to the NLF, the OND does not require MSs to use the ICSMS for products not compliant with the Directive. On the contrary, MSs need to report to the EC that will immediately start an investigation on the matter.

Despite not being necessary, some MSs have however used the tool to share information on their market surveillance activity and results. In the period 2016 – 2018, about 70 compliance reports were input into the system. Most of them (n=60) came from the UK[116] and covered four types of equipment: air compressors, chainsaws, high-pressure water jet machines and power generators.

[113] Based on information reported on the ICSMS database (https://webgate.ec.europa.eu/icsms/public/authoritySearch.jsp?locale=en) and the national programmes published at http://ec.europa.eu/growth/single-market/goods/building-blocks/market-surveillance/organisation_en.

[114] Opinion shared by most stakeholders reached, in particular 78% of Market Surveillance Authorities and Notified Bodies surveyed reported that market surveillance in their country could be improved.

[115] Opinion shared by most stakeholders reached, in particular 60% of Market Surveillance Authorities surveyed reported that more training would be required.

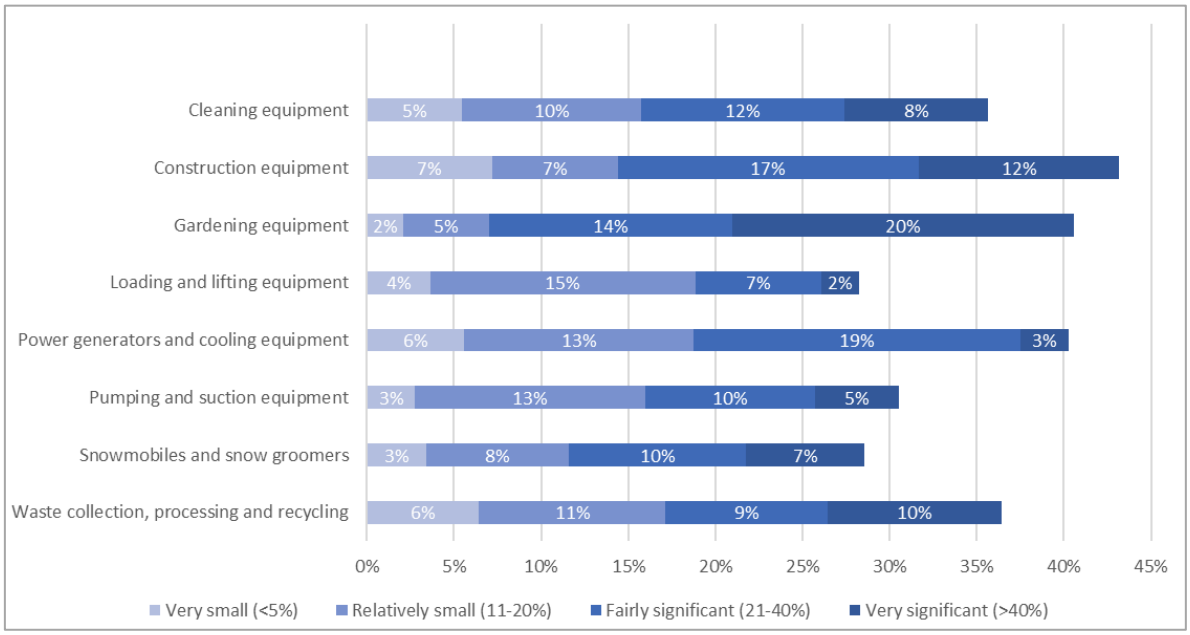
[116] The other countries of origin were: Belgium (1), Portugal (1), Poland (1), Germany (6). The Belgian did not indicated the type of equipment controlled.

Almost half of the equipment reported (n=29) was found to be non-conforming, the main causes being incomplete or absent Declaration of Conformity (n=19)[117]. According to Article 9 of the OND, this kind of non-conformity would not warrant a notification to the Commission, as long as the manufacturer or their authorised representative established in the Community brings the equipment into conformity.

Although consulted stakeholders consider that the OND had a positive effect on the prevention of non-compliant equipment on the market (about 46% of respondents to the OPC, n=69), **there is a general agreement that non-conform equipment reaches the market mostly undisturbed**. However, no general statistics were identified to support this view[118].

Stakeholders' views on the share of non-compliant equipment on the market are quite scattered. As shown in Figure 6-2, less than half of respondents took a stand[119], and the opinions expressed are very diverse.

Figure 6-2: Q45. According to your experience, which sectors have the largest share of non-compliance with the requirements of the Directive, and what is the share of non-compliant products on the market?



Source: Open Public Consultation

Weighting the answers from the Public Consultation, according to the stakeholders consulted **the gardening sector has the largest share of non-compliant equipment,** followed by construction, power generators and cooling. While this data cannot be taken as a definitive indication of the share of non-compliant equipment currently on the market, it represents the stakeholders' perception of the status quo. In particular, stakeholders are convinced that smaller equipment destined for private use tends to be more at risk of non-compliance than professional equipment.

[117] Other causes of non-conformity were: presence of non-compliant Declaration of Incorporation (not a requirement under the OND), the absence of DB label on the machine (n=1) and the difference between the information provided on the product and what is recorded (n=1).

[118] Also the survey conducted among Market Surveillance Authorities and Notified Bodies did not provide any supporting data.

[119] For clarity of representation the share of respondents that selected 'Don't know' is not shown in the figure.

There have been studies that confirm that a fairly significant share of the manufacturer's documentation, including Declarations of Conformity, manuals and other, have numerous (non-trivial) shortcomings.

The NOMAD project[120] analysed more than 1,500 sets of instructions from machines covering 40 broad machine-families from 800 different manufacturing companies. The exercise found that about 80% of the instructions were not compliant with the legal requirements set by the Machinery Directive.

Similarly, the Health and Safety Laboratory in the UK assessed a sample of 73 sets of instructions across 14 different machine types against the requirements using the same methodology as the NOMAD project. The aim was to assess the suitability of information on noise emissions required under the Supply of Machinery (Safety) Regulations and the Noise Emission in the Environment by Equipment for Use Outdoors Regulations for workplace risk assessment. About 82% of the sample had inadequate noise emission information.

While this data is not strictly linked to the respect of the noise emission limits set by the OND, it is still an indication of insufficient controls by Market Surveillance Authorities and of a potential presence on the market of non-compliant equipment. This assumption is supported by all stakeholders consulted for this study. There is a shared concern with regards to the large number of non-conform products available on the market. These worries focus mostly on smaller, cheap equipment, mostly destined for private use, that can be easily imported from non-European countries.

The issue of ensuring market safety and enforcing EU product rules in the Single Market is however not limited to the respect of the obligations deriving from the OND, but it is a horizontal issue. There is a general recognition, summarised in a recent European Commission communication[121], that the whole market surveillance framework needs to be rethought.

As discussed in section 5.1, the Commission Proposal on Market Surveillance (COM(2017) 795 final)[122] was tabled in December 2017 to address the increasing number of non-compliant products on the Union market. It aims to consolidate the existing market surveillance framework, to encourage joint actions by Market Surveillance Authorities from multiple Member States, to improve the exchange of information and coordination, and to create a strengthened framework for controls on products entering the market.[123] With respect to market surveillance resources, it includes provisions for the Member States to equip MSAs with the necessary financial resources to properly perform their tasks (Article 21(1)) and for the Union to potentially finance the implementation of national market surveillance strategies (Article 36(2f)).

[120] NOMAD Steering Committee (2012). Report on the 'NOMAD' project – A survey of instructions supplied with machinery with respect to noise and the requirements of the Machinery Directive. Available at: http://www.hse.gov.uk/noise/nomad-report.pdf;
Pelkmans, J., Correia de Brito, A., Griner, A. and Luchetta, G. (2014) study on the merger of the directive on Noise from Outdoor Equipment, 2000/14/EC, with the Machinery Directive, 2006/42/EC (including an evaluation of Directive 2000/14/EC) - final report. Available at: https://ec.europa.eu/docsroom/documents/4985/attachments/1/translations/en/renditions/pdf.

[121] Communication from The Commission to the European Parliament, the Council and the European Economic and Social Committee (COM/2017/0787 final). The Goods Package: Reinforcing trust in the single market. Available at: http://eur-lex.europa.eu/legal-content/EN/ALL/?uri=COM%3A2017%3A787%3AFIN.

[122] http://eur-lex.europa.eu/legal-content/EN/HIS/?uri=COM%3A2017%3A795%3AFIN.

[123] COM(2017) 795 final, p. 1.

The market surveillance activity is by definition exercised ex-post on machinery already on the market. An ex-ante control is, on the contrary, carried out by Notified Bodies. Although not imposed by any legislation, synergies between MSAs and NBs could lead to better results in preventing non-compliant equipment from reaching the market. About half of the respondents to the survey to MSAs and NBs recognised that this type of collaboration is missing in their country. The Italian MSA launched several years ago a practice to allow a dialogue between them and the Notified Bodies.

Text Box 6-1: Italian MSA: Yearly OND conference with Notified Bodies

The Italian Market Surveillance Authority established a two-way communication channel with national Notified Bodies (NBs) through a yearly conference. This yearly meeting aims at allowing a constructive dialogue between the two parties in order to discuss existing issues concerning the Market Surveillance in relation to the Outdoor Noise Directive and suggest potential solutions.

About 10 Notified Bodies took part at the latest meeting, held on May 2017. At this meeting the following topics were discussed:

- Summary of Market Surveillance activities conducted over the previous year;
- The activity programme for the current year;
- Key market surveillance issues emerged during the previous year;
- Proposal for the development of a national database for conformity certificate issued by the Notified Bodies.

The meeting was also the opportunity for the Market Surveillance Authority to stress some good practices the Notified Bodies would need to adopt. The NBs were invited to pay more attention to the legal references that need to be included in the conformity certificates and to provide sufficient assistance to the manufacturing companies in the drafting of the declarations of conformity.

From their side, Notified Bodies can use this opportunity to discuss with Market Surveillance Authorities issues they face in their activities and clarify how to deal with specific situations.

The meeting is regarded as a useful exercise to ensure greater understanding between the parties and a smoother collaboration.

6.1.6. By merging previous legislation, did the Directive simplify legislation improving stakeholders' activities?

Before the OND came into force, seven product Directives and two procedure Directives applied to the following types of equipment:

- 79/113/EEC and 84/532/EEC on Construction Plant Equipment
- 84/533/EEC on Compressors
- 84/534/EEC on Tower Cranes
- 84/535/EEC on Welding Generators
- 84/536/EEC on Power Generators
- 84/537/EEC on Concrete Breakers
- 84/538/EEC on Lawnmowers
- 86/662/EEC on Hydraulic Excavators.

The OND merged and replaced these Directives, at the same time extending the population of equipment subject to noise limits or noise marking.

This simplification brought greater clarity to the concerned legislative framework and improved the activity of all stakeholders.[124] In particular, it was noticed that the OND became a reference point for manufacturers, Notified Bodies and authorities. Both can, in fact, find all information required (type of equipment, limit and test code) in one single document.

Even if the simplification of previous legislation was welcomed by stakeholders, **the classification and grouping of products that are currently applied might cause difficulties for manufacturers in understanding whether a product is actually covered by the Directive and increase the risk of arbitrary inclusion or exclusion of equipment from the reach of the OND**[125]. As an example, the category of *Power sweepers* (item 46 of Annex I of the OND) may cover at least four different types of equipment:

- **Walk-behind sweepers *without* an energy source**: these are floor treatment machines for commercial use with or without traction drive. They are manually pushed and not falling under the machine definition of the Machinery Directive[126].

- **Walk-behind sweeper**: these machines have a traction-drive but are intended to be used inside of factories and logistical facilities and not outside of them.

- **Ride-on sweepers**: these are also mostly used inside factories and logistical facilities but could also be used outside.

- **Walk-behind road sweepers**: these are pedestrian controlled, self-propelled machines equipped with a front mounted sweeping attachment.

Similarly, the category of *Concrete and mortar mixers* (item 11 of Annex I of the OND) covers a wide range of products spanning from small electric mixers to larger ones powered by combustion engines.

6.1.7. Were noise limits set achievable? Are there specific types of equipment that represent a challenge in meeting the standards?

By complying with the OND over the years, manufacturers have proved that the noise limits set by the Directive were indeed achievable.

No stakeholder mentioned a specific type of equipment for which it was particularly difficult from a technical point of view to reach the required noise reduction. However,

[124] Out of the 103 respondents to the OPC that expressed an opinion on this subject, 99% think that 'By merging previous legislation (7 product and 2 procedure Directives), Directive 2000/14/EC improved the effectiveness and internal coherence of EU legislation'.

[125] Supported by different groups of stakeholders (Notified Bodies and sector organisations mostly). Also the ODELIA study suggested a reorganisation of the products grouping.

[126] As per Article 2 of the Machinery Directive: "'machinery' means: — an assembly, fitted with or intended to be fitted with a drive system other than directly applied human or animal effort, consisting of linked parts or components, at least one of which moves, and which are joined together for a specific application, — an assembly referred to in the first indent, missing only the components to connect it on site or to sources of energy and motion, — an assembly referred to in the first and second indents, ready to be installed and able to function as it stands only if mounted on a means of transport, or installed in a building or a structure, — assemblies of machinery referred to in the first, second and third indents or partly completed machinery referred to in point (g) which, in order to achieve the same end, are arranged and controlled so that they function as an integral whole, — an assembly of linked parts or components, at least one of which moves and which are joined together, intended for lifting loads and whose only power source is directly applied human effort;".

when designing a product, manufacturers need to balance different features often in conflict between each other (e.g. a more powerful tool will be less energy efficient, while less polluting equipment may need to use an engine requiring more ventilation and therefore producing more noise).

In general, the choice of which features to privilege aims at developing products that will attract consumers. While manufacturers tend therefore to invest more resources into product characteristics that are most appealing to customers (see section 6.1.4), they are also forced by legal obligation to strike a certain balance.

The Non-Road Mobile Machinery Regulation (EU) 2016/1628[127] requires manufacturers to reduce the pollutant emissions of specific types of equipment, some of which are also covered by the OND (see section 6.4.1). Improving on a specific feature may mean having to compromise on another one. So, for example, using Diesel engines to reduce CO_2 emissions requires stronger ventilation to avoid overheating. Stronger ventilation, however, means additional fans and more openings, that in turn increase the noise produced by the machine.

By way of examples, one sector organisation mentioned that smaller equipment would switch more and more from older diesel engines based on Indirect Injection (IDI) to new engines based on Direct Injection (DI). The switch is made in order to meet the exhaust emissions requirements; however, the DI engines are noisier than the IDI type. As an example, for Mobile Elevating Work Platforms (MEWPs) the noise is mostly produced by the truck engine and only a very small percentage by other components of the machine (e.g. valves, upper structure): given the requirements of the existing Directive on engine exhaust emissions[128] and the new engine exhaust emissions regulation[129] it was reported that it would be technically and economically difficult to further reduce noise emissions.

If achieving the required noise reduction may not be technically difficult per se, when this objective is put into the context of a complex machine where different features (performance, energy efficiency, safety, weight, noise, cost, etc.) must be balanced, reaching the same result may represent a challenge. **Manufacturers may have to bear high R&D costs to achieve technical improvements and, as mentioned above, they are reluctant to do so if this does not provide a competitive advantage attracting more customers**.

As mentioned above, the noise limits currently set by the OND were established in 2000 and, for only a few equipment types, updated in 2005. Noise limits have not been updated since and the EC launched a study in 2015 (ODELIA) to investigate and determine the possibility and need for a revision of the limits. The study found that for ten equipment types it would be possible and advisable to tighten noise limits set by Article 12. On top, the study suggested setting noise limits for 28 equipment types only subject to noise marking (Article 13). This indicates that updating the requirement of the OND is not an easy procedure and given the existing shortcomings affecting the Noise database (see section 6.1.11) at this stage there is not the possibility to establish a less burdensome procedure for the noise limit revision.

[127] https://ec.europa.eu/growth/sectors/automotive/environment-protection/non-road-mobile-machinery_en
[128] 97/68/EC; 2-stage reductions: 2010-2012 and 2014
[129] https://ec.europa.eu/growth/sectors/automotive/environment-protection/non-road-mobile-machinery_en

6.1.8. Did compliance with the Directive stimulate R&D in the industry?

The legal obligation established by Article 12 of the Directive forced manufacturers to invest resources in the research and development of special design, mechanisms and strategies to reduce noise emissions. As discussed above (see section 6.1.4), manufacturers tend to prioritise product characteristics that are most appealing to customers, but legal obligations such as the ones set out by the OND force them to still consider other features and to ensure a certain balance.

Two-thirds of the respondents to the public consultation (65%, n=97) recognised this positive effect of the OND on research, development and innovation of equipment covered by the Directive. Manufacturing companies that replied to the OPC, however, presented a more mixed view with an equal spread across the three main options: No effect (25%, n=8), Negative effect (31%, n=10), Positive effect (34%, n=11).

It is difficult for stakeholders to define the amount of R&D spent by companies on this specific aspect of product development. R&D budgets are usually more holistic and, as mentioned above, including many other product features on top of noise emissions. CATI respondents were asked the share of R&D budget allocated to Noise reduction. Although the following values need to be interpreted with caution due to the just mentioned limitation, Table 6-11 shows that:

- In most sectors, manufacturers invested more R&D resources to reduce noise emission of equipment under Article 12 in comparison to equipment under Article 13;
- The cleaning sector invests most resources into noise reduction despite the fact that all the related equipment is under Article 13. This conclusion is in line with the considerations made in section 6.1.4;
- similarly, also the power generators and cooling equipment sector invests on average more than the other sectors on noise reduction.

Table 6-2: Estimated expenditure in R&D as share of sector turnover

	All equipment	Equipment under Article 12	Equipment under Article 13
Cleaning equipment	7.0%		7.0%
Construction machinery	3.3%	4.5%	2.0%
Gardening equipment	3.8%	5.4%	3.0%
Loading and lifting equipment	3.0%	2.2%	3.1%
Power generators and cooling equipment	5.1%	5.4%	4.1%
Pumping and suction equipment	4.1%	4.8%	3.4%
Snowmobiles and snow groomers	2.5%		2.5%
Waste collection, processing and recycling	2.5%	2.5%	3.0%

Source: CATI interviews

Although the general agreement is that the OND promoted and forced innovation with regards to this specific feature, it must be considered that some technological developments would have driven improvements in this area even without the Directive

(50% of respondents to the public consultation, n=75, share this opinion). As an example, electric engines enabled manufacturers to develop products offering similar performance to their combustion engine (CE) counterpart, but with lower noise emissions.

In any case, the OND came into being in a period when noise emissions and noise pollution by outdoor equipment were only starting to appear on national agendas (and the OND remains almost unique at international level) and it had the effect of raising awareness of this issue. Over the years there have been more initiatives at national and local levels targeting noise emissions, indicating a renewed interest in this issue (see sections 5.1 and 6.4.6).

The costs associated with R&D are discussed in more detail in the efficiency section 6.2.6.

6.1.9. Are current conformity assessment procedures effective? Was the given choice between different conformity assessment procedures (CAP) a benefit allowing flexibility, or did it create confusion?

The key element of the conformity assessment procedures consists of the test codes and measurement methods used to perform the measurement. The test codes, or standards, are defined by the OND for each specific equipment. There are two ways to change the test codes: a) through the Committee established in accordance with Articles 18 and 19 of the Directive; or b) through a general revision of the Directive.

The test codes and measurement methods have not been updated since entry into force of the Directive itself. More than a third of the manufacturers that responded to the Public consultation reported a low degree of satisfaction with this specific aspect of the conformity assessment, indicating that the procedures are poorly adapted to technical progress (38%, n=10)[130].

Current test codes for the majority of the equipment covered by the OND are therefore not in line with technological development and would need to be revised. The ODELIA study found that test codes for 31 equipment types could be replaced by better ones. More than half of the respondents to the public consultation (53%, n=80) expressed the opinion that the Directive does not support adaptation to technical progress for equipment within its scope.

The inclusion of test codes directly in the body of the Directive was in line with the legislative practice of the time and motivated by the existence of sound power limits. Indeed, **a limit has a meaning in relation to a specific measurement procedure. Changing the procedure may imply having to revise the limit as well**: A limit that is achievable in relation to a specific test code may not be achievable anymore in case of a stricter measurement procedure[131].

A different approach was employed by the Machinery Directive based on the New Approach legislation and referring to harmonised standards. Harmonised standards are not incorporated in the body of the law and can, therefore, be updated independently from it. While this approach could also be adopted by the OND, there is a fundamental difference between the two policy instruments. The OND establishes sound power limits whereas the Machinery Directive does not.

[130] Another 38% considered the procedure neutral/fair in relation to this aspect, and only a quarter (23%, n=6) reported a positive view.

[131] Opinion shared by most stakeholders reached.

The overlap between the OND and the Machinery Directive also causes issues of coherence and efficiency (see sections 6.4.1 and 6.2.4). Both require the measurement of sound emissions, but the former looks at the sound power and the latter at sound pressure, and they require that the respective measurements should be done with different methods.

The lack of a clear and uniform procedure to determine the measurement uncertainty[132] in the OND may cause inconsistency between guaranteed power levels depending on the subject performing the measurement. The uncertainty is needed to establish the guaranteed power level, calculated as the sum of the measured power level and the uncertainty. The determination of the uncertainty is therefore fundamental to ensure that declared guaranteed power levels are legitimate, reliable and comparable. The OND does not include a procedure to determine the uncertainty, and this gap is partly filled by an agreed method between Notified Bodies.

In terms of types of conformity assessment procedure, in the context of the third-party assessment, the OND allows a choice between three types of procedures:

- Internal control of production with assessment of technical documentation and periodical checking (Annex VI)
- Unit verification (Annex VII)
- Full quality assurance (Annex VIII)[133]

No concerns were raised with regards the three conformity assessment procedures. These three procedures were developed in order to allow enough flexibility to manufacturers depending on the type of products and company organisation. So, companies that have the resources can develop an internal Quality Assurance System (Annex VIII) to determine in-house the measured sound power level, the uncertainties and the guaranteed value. Manufacturing companies producing unique or tailored equipment can employ the 'Unit verification' process, while in all other cases the procedure under Annex VI is used.

The lack of Notified bodies in some countries is a barrier for manufacturers. As discussed in section 5.2, dedicated Notified Bodies have not been established in all Member States. There are no dedicated NBs in Cyprus, Estonia, Greece, Ireland, Latvia, Lithuania, Malta, or Portugal. This can be explained by the limited market size in these countries. Smaller countries have only a few producers of equipment covered by the OND, this means that NBs in these countries will have only a few potential customers, making the market less attractive. Producers in these countries have to cope with this by reaching out to Notified Bodies in other countries, thus facing additional costs and longer turnaround periods.

It is not clear whether the third-party conformity assessment procedure contributed to ensuring that only compliant products are placed on the EU market. The lack of data on non-conform product reaching the market (see section 6.1.5) does not allow to assess whether the existence of NB hinders the proliferation of non-compliant equipment. Stakeholders reported different opinions in this regard. On one side there are manufacturing companies mostly advocating a self-certification system. On the other, consumer organisations, MSAs and also a few sector

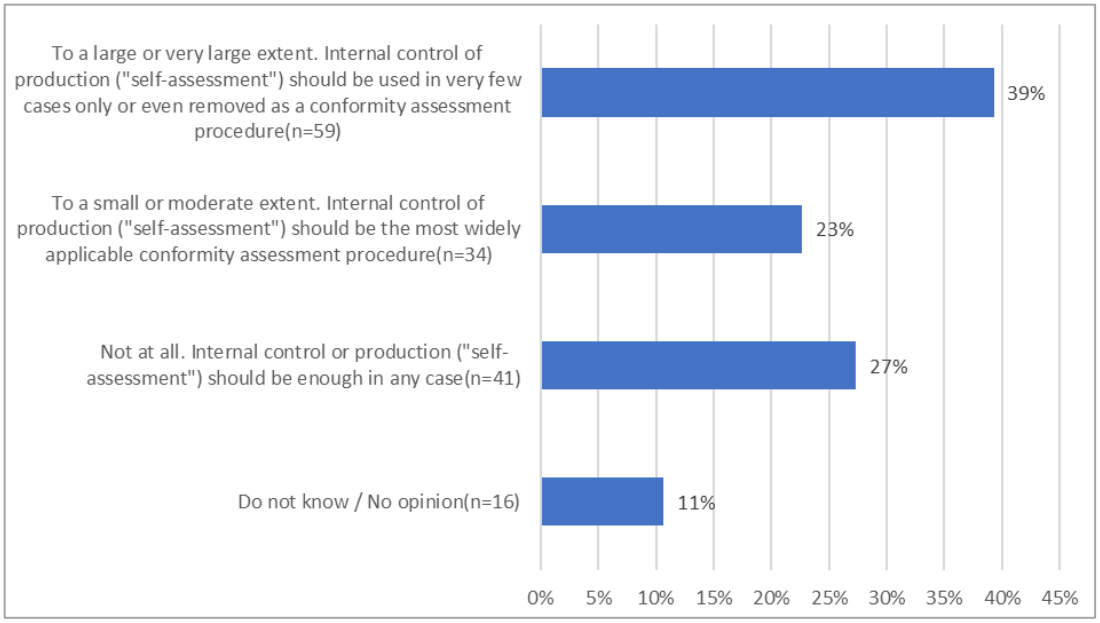
[132] Measurement uncertainty belongs intrinsically to the measurement method used. measurement uncertainty associated with a measured value incorporates all sources of uncertainty that are attached to the method. See Guidelines for the application of Directive 2000/14/EC for further information http://ec.europa.eu/docsroom/documents/24042.

[133] For a detailed description: Guidelines for the application of Directive 2000/14/EC http://ec.europa.eu/docsroom/documents/24042.

organisations consider the third-party conformity assessment as the first line of control to ensure the compliance of products reaching the market.

Opinions expressed through the public consultation also represent this diversity of views. An equal mix of different stakeholders (private individuals, sector organisations, public authorities, sector experts, etc.) support both positions which confirms the complexity of this dialogue (see Figure 6-3).

Figure 6-3: Q47. Do you think that third party conformity assessment procedures (with the intervention of a Notified Body) contribute to ensuring that only compliant products are placed on the EU/EEA market?



Source: Open Public Consultation

If the third-party conformity assessment is to be kept, the uniform quality of the Notified Bodies should be ensured. Although it is not the focus of this study to evaluate the activity of Notified Bodies, several stakeholders reported that the assessments performed by NBs have not the same level of quality and reliability across the entire EU. As mentioned above, noise emission measurement is an extremely technical procedure, and a number of factors can impact its results, from the skills and experience of the professionals working in the NB to the equipment available.

Requirements for NBs are enshrined in Annex 9 of the OND. In 2008, in the context of the New legislative framework, a new set of more stringent rules for the accreditation of Notified Bodies was defined[134], in particular regarding rules on conflict of interest and higher requirements concerning the competences of the personnel carrying out the conformity assessment[135]. However, the OND has not been aligned to the New Legislative Framework.

6.1.10. Was there an increase in the international trade of outdoor equipment? Was competition from manufacturing companies

[134] Article R17, Decision 768/2008 on a common framework for the marketing of products, which includes reference provisions to be incorporated whenever product legislation is revised. In effect, it is a template or "toolbox" for future product harmonisation legislation: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32008D0768&from=EN.

[135] The full comparison is provided in the Annex.

extra-EU affected by the lower noise standards set by the Directive?

There is a general agreement that the OND allowed for better trading across borders inside the EU, but data is scarce. The merit of the OND is to have prevented the emergence of different regulations at the national level that may have hindered the intra-EU circulation of covered equipment. Whether this has led to an increase in international trade of outdoor equipment is more difficult to assess.

As described in section 4.7, there are a number of issues limiting the use of data on cross-border and international trade. In particular, product categories used by the available statistics databases (Estat and Prodcom) do not always match perfectly with the equipment types covered by the OND. Secondly, the 2008 economic crisis deeply impacted the market, making the identification of market trends over the period 2007 – 2018 extremely difficult[136].

It was possible to match Prodcom and Harmonized System (HS) codes (used in ESTAT statistics)[137,138] for the following nine equipment types. As shown in Table 6-3 this equipment is differentiated by sector and current obligation (if currently under Article 12, under Article 13 or not included in the scope of the OND).

Table 6-3: Equipment types and Prodcom code matches

Sector	Equipment	Current article	Prodcom code
Construction machinery	Dumpers (< 500 kW)	Article 12	28922900
Loading and lifting equipment	Tower cranes	Article 12	28221440
Power generators and cooling equipment	Welding generators	Article 12	27903199
Construction machinery	Concrete or mortar mixers	Article 13	28924050
Construction machinery	Drill Rigs	Article 13	28921253
Gardening equipment	Shredders/chippers	Article 13	28491275
Construction machinery	Truck mixers	Article 13	29105950
Loading and lifting equipment	Vehicle mounted loader cranes	New	29105100
Cleaning equipment	Walk-behind road sweepers, no aspirators (motorized broom)	New	16291130

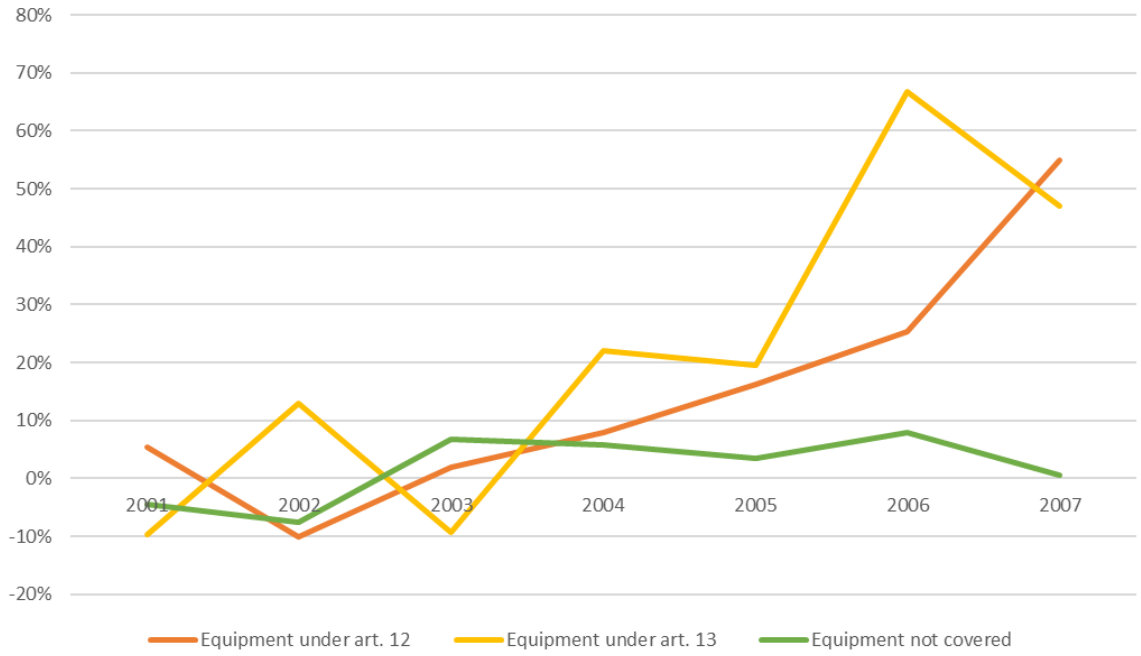
[136] Data for the post-2008 period is extremely erratic and, independently from the equipment types, no trend can be identified.

[137] The Equipment types are: Concrete or mortar mixers (Prodcom code:28924050); Drill rigs (Prodcom code:28921253); Dumpers (< 500 kW) (Prodcom code:28922900); Shredders/chippers (Prodcom code:28491275); Tower cranes (Prodcom code:28221440); Truck mixers (Prodcom code:29105950); Welding generators (Prodcom code:27903199); Vehicle mounted loader cranes (Prodcom code:29105100); Walk-behind road sweepers, no aspirators (motorized broom) (Prodcom code:16291130).

[138] The HS nomenclature is developed by the World Customs Organization (WCO) and categorize traded goods into 5,000 commodity groups.

Intra-EU trade data for the period 2000-2007 shows that equipment covered by Articles 12 and 13 performed better than equipment that is not covered, with more constant increases over time. While this could be due to different factors, the fact that the OND prevented the emergence of different regulations at the national level may be one of them[139].

Figure 4 Percentage change of intra-EU trade (2001 – 2007) by group of equipment[140]



Source: Estat, EU trade since 1988 by HS6 [DS-016893]

The issue of extra-EU trade, on the contrary, is more complex and has to be explored from two perspectives: European manufacturers selling their products abroad and manufacturers from third countries exporting their products to the EU market.

The cornerstone of the discussion is the existing legislation in other countries. All stakeholders interviewed, and desk research conducted highlighted that the EU is at the forefront in terms of regulation of the noise emissions of outdoor equipment. The WHO recognises the importance of noise pollution mitigation and the impact of noise exposure on health[141] and in 2009 a 'Night noise guidelines for Europe' was published[142]. A fact sheet on possible policy interventions for noise reduction has been recently published encouraging the development of dedicated policy. It has to be noted however that these documents are targeting the European region and are resources available on the European focused WHO website[143]. Similar attention seems

[139] Estat: EU trade since 1988 by HS6 [DS-016893], extracted in June 2018.
[140] Equipment under Article 12 include: Dumpers (< 500 kW); Tower cranes; Welding generators. Equipment under Article 13 include: Concrete or mortar mixers; Drill Rigs; Shredders/chippers; Truck mixers. Equipment not covered include: Vehicle mounted loader cranes; Walk-behind road sweepers, no aspirators (motorized broom).
[141] Burden of disease from environmental noise: Quantification of healthy life years lost in Europe, http://www.euro.who.int/__data/assets/pdf_file/0008/136466/e94888.pdf.
[142] http://www.euro.who.int/__data/assets/pdf_file/0017/43316/E92845.pdf.
[143] http://www.euro.who.int.

to be lacking on the international website of the WHO. Noise is not listed as a standalone 'health issue', but it seems to be covered in connection with other health conditions[144]. For example, the causes of hearing loss and deafness include 'excessive noise, including occupational noise such as that from machinery and explosions'[145].

In the US the main policy document concerning noise emissions and noise pollution is the Noise Control Act (NCA 72) approved in 1972. This document allocates primary responsibility for control of noise to State and local governments, considered the best placed to ensure the protection of their citizens. This approach was later confirmed in the 1990 Clean Air Act[146]. The US Environmental protection agency (EPA) has the authority to investigate and study noise and its effect, disseminate information to the public regarding noise pollution and its adverse health effects[147]. However, mainly due to lack of funding, the noise standards have not been evaluated since the 1970s[148].

In Japan, the Noise Regulation Law approved in 1968 and updated in 2000 establishes environmental quality standards to be respected in residential areas, to be identified by local authorities[149]. The standards were defined in 1998 and differentiate between three different types of areas: 'areas where quietness is especially required, such as those where convalescent facilities and welfare institutions are concentrated; areas used exclusively for residences; areas used mainly for residences; areas used for commerce and industry as well as for a significant number of residences' [150]. However, these environment quality standards do not apply to noise produced by aircraft, railway, or construction work.

Similar experiences are reported in Australia and Canada[151].

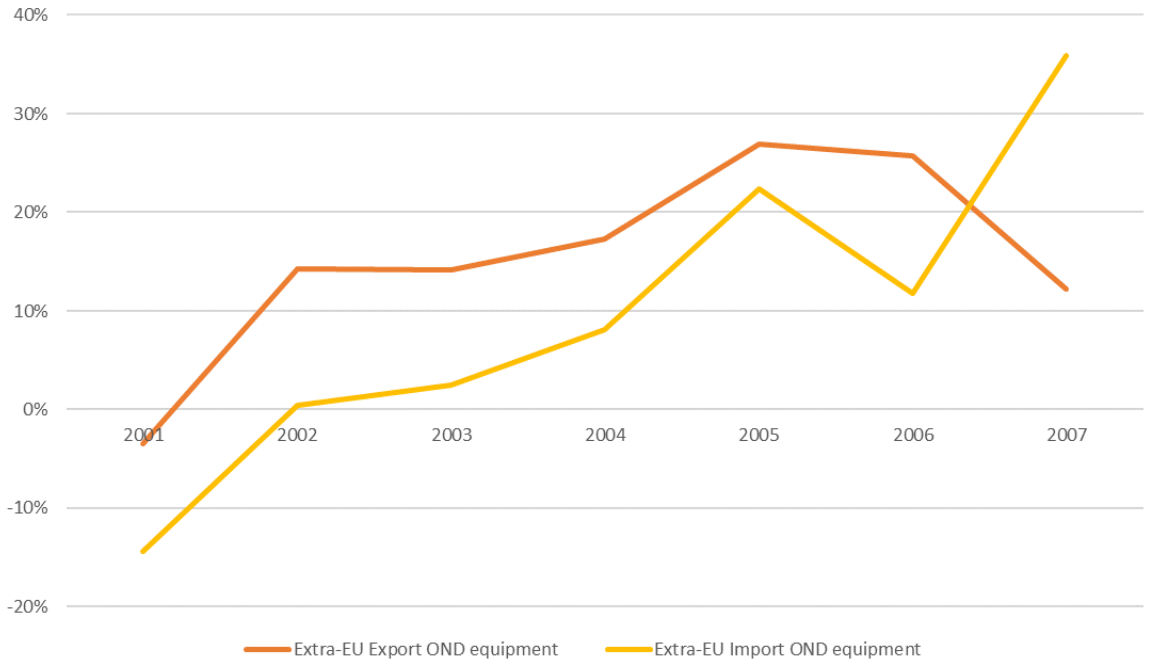
The result is twofold: on the one hand, European manufacturers have to comply with stricter regulations than non-EU producers; on the other hand, non-EU manufacturers will have to comply with the stricter EU limits if they wish to sell their products in the EU.

The consequence of this setting could be that European manufacturers should be able to propose to foreign markets more advanced products resulting more appealing to customers abroad. In contrast, non-European manufacturers will have to catch up on R&D to design products in compliance with EU regulation, giving a competitive edge to EU producers.

As a result, it would be expected an increase of exports toward non-EU countries and a decrease in imports. This, however, does not seem to be the case. Extra-EU trade data for the period 2000-2007 does not point in any of these directions. Both import from and export to non-EU countries increased over that period in line with the overall market trend.

[144] http://www.who.int/health-topics/.
[145] http://www.who.int/en/news-room/fact-sheets/detail/deafness-and-hearing-loss.
[146] https://www.epa.gov/clean-air-act-overview/clean-air-act-title-iv-noise-pollution.
[147] https://www.epa.gov/history/epa-history-noise-and-noise-control-act.
[148] National Academy of Engineering (2010). Technology for a Quieter America. Washington, DC: The National Academies Press. https://doi.org/10.17226/12928.
[149] https://www.env.go.jp/en/laws/air/noise/index.html.
[150] Between 50dB and 60dB in daytime and 40dB and 50dB in night time. https://www.env.go.jp/en/air/noise/noise.html.
[151] J. Luis Bento Coelho, Community noise ordinances, 2007, available at http://www.quiet.org/documents/CommunityNoisesWorldwide.pdf.

Figure 5 Percentage change of extra-EU trade (2001 – 2007) of OND equipment[152]



Source: Estat, EU trade since 1988 by HS6 [DS-016893]

Stakeholders interviewed for this study mentioned that when going abroad EU manufacturers have to deal with customers who (like their EU counterparts) are not particularly sensitive to noise emissions, but they are more interested in equipment performance. This obliges some EU producers to adapt their products to these preferences by changing the design, increasing the power and even removing noise reduction elements from the products to reduce weight and increase power[153]. As a result, rather than favouring the competitiveness of EU producers the stricter noise emissions thresholds set by the OND can undermine the competitiveness of EU companies selling abroad.

Table 6-4 reports the views of rental and manufacturing companies that answered the CATI interview. According to the majority of the respondents, the OND did not have any impact on the respondents' business either in their home country, in the EU market or outside the EU. Interestingly respondents consider that the OND made slightly more difficult intra-EU trade than extra-EU. This is probably due to the fact that while manufacturers have to meet the requirements set by the OND for the EU market, they do not have so for extra-EU. In this sense, the impact of the OND on extra-EU trade is less felt than the one on intra-EU trade.

[152] Equipment under Article 12 include: Dumpers (< 500 kW); Tower cranes; Welding generators. Equipment under Article 13 include: Concrete or mortar mixers; Drill Rigs; Shredders/chippers; Truck mixers.

[153] For example, it was mentioned that isolation material or dampers used to reduce fans noise are often removed for the models destined to extra-EU market.

Table 6-4: Extent to which the OND made it easier or more difficult to conduct business abroad

	Much more difficult/ Somewhat difficult	No impact	Somewhat easier/ Much easier	Don't know	Total
In the home country	24%	54%	14%	8%	538
In the rest of the EU	24%	51%	17%	8%	387
In other extra-EU countries	16%	53%	22%	9%	306

Source: CATI interviews

Similarly, only about a fourth of the respondents (n=43) to the Public Consultation believes that the OND has had an impact on competition from manufacturing companies outside of the EU.

At the same time, issues with market surveillance and enforcement (described below) mean that EU manufacturers do not enjoy a competitive edge in the EU market as a result of OND limits. Although official data are not available, all stakeholders mentioned that there is a large number of non-compliant equipment imported from non-EU countries that are competing with their EU counterparts (see also next section)[154].

6.1.11. Is the NOISE database an effective tool?

As described in section 2.1, in order to be able to progressively update the OND in line with technological developments, the legislator requires sound data on the state of the art of noise emission.

The database has the potential to be a useful tool, but it needs improvements. In 2007 and in 2015, two studies were conducted to determine the need to and feasibility of updating the noise limits. Although both studies managed to accomplish the objective, they also highlighted the limitation of the database:

- incorrect equipment type was registered;
- electrical and combustion engine powered equipment was often mixed;
- technical parameters were often missing or clearly out of range, especially for Article 13 equipment;
- data from important manufacturers were found missing[155].

The ODELIA study was able to rely only on 77% of total data available in the database while the publicly accessible research function of the database was taken offline in 2016 due to the low quality and reliability of the output data.

[154] Communication from The Commission to the European Parliament, the Council and the European Economic and Social Committee (COM/2017/0787 final). The Goods Package: Reinforcing trust in the single market. Available at: http://eur-lex.europa.eu/legal-content/EN/ALL/?uri=COM%3A2017%3A787%3AFIN.

[155] Dittrich, M. (TNO), Spellerberg, G. (TÜV-Nord) Carletti, E. and Pedrielli, F. (IMAMOTER) (2016). Study on the suitability of the current scope and limit values of Directive 2000/14/EC relating to the noise emission in the environment by equipment for use outdoors ("ODELIA") – Final Report. European Commission, Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs. Available at: http://ec.europa.eu/DocsRoom/documents/18281/attachments/1/translations/.

Some of the issues reported were due to the data input method used over the first years of existence of the database. Manufacturers were sending paper documents to the European Commission that then had to manually input into the database. This two-step procedure led to mistakes and false data that undermined the reliability of the database.

In recent years the tool was upgraded to be filled directly online. However, this tool is still considered outdated, the user interface not user-friendly, and the management of companies' profiles and equipment registered not sufficiently easy and flexible. Manufacturers, for example, have problems in registering their "brand names" and the system to validate/accept the requests for authorised representatives[156] is not working.

The database should also ideally provide a clear picture of the market and the manufacturers active in the sectors covered by the OND. However, over the years there has not been control over the users registering in the database. Manufacturing companies could, for example, create multiple accounts or authorised representatives could register the same company creating a risk of double counting. Also, information on manufacturers that sent their Declaration of Conformity by email or post was not recorded.

Also, the data exporting features of the database appear to be limited and not sufficient to comply with the objective of providing comprehensive information on the status of the market for outdoor equipment.

The database was not exploited to its full potential. The database functionalities could have been over time extended to serve as a tool for manufacturers, consumers, and market surveillance.[157] For example, it could have been used by MSA and consumers to quickly access information on the equipment.

The database as it is will most likely stop working by 2020. The NOISE database is an application using the Adobe ColdFusion web application development platform. This technology is outdated, and Adobe will stop its support in 2025. Also, the informatics services of the Commission, in the context of a wider efficiency assessment exercise, decided to stop their technical support to the NOISE database by the end of 2020. This means that after that date the database will no longer be functional.

Given the current shortcomings of the database and its limited access and functionalities, it is clear that, if the report, collection and publication obligations ex Article 16 are to be kept (and there are reasons to do so) a complete revision of the database is to be envisaged. All the stakeholders highlighted the need for refurbishment of the tool. In the absence of such action, manufacturers would prefer the obligation ex. Article 16 to be lifted.

[156] Companies acting as Authorised Representatives can submit and manage Declaration of Conformity on behalf of one or several manufacturers that they represent.

[157] Although limited by the low response rate of users of outdoor equipment, results of the public consultation present a mixed view on the utility of a similar database providing data on noise emission levels of covered equipment. While half of the respondents (n=6) see positively such a resource, the other half consider it redundant considering the existence of comparison services and specialised websites that provides similar information. In interviews it was suggested that the database structure could be changed, basing it on a unique tracking code for each model of equipment (bar code or QR code) so that the history of each model can be traced. This would permit to identify which serial numbers of each model have certain declared values and which others have been successively updated, which models have stopped their production and when it happened. A system of QR codes on noise labels could be introduced allowing information access to MS authorities (special app) and to consumers (comparison with standards, information etc.).

6.1.12. Are there unexpected or unwanted effects?

Risk of undermining the level playing field in the sector

The problems with the market surveillance highlighted above prevent the OND from reaching its full potential. Indeed, gaps in market surveillance mean that non-conform products on the market risk to undermine the competitiveness of compliant companies. This is especially the case because consumers often do not understand (or care much about) noise emissions and the related product labelling. As price remains one of the key purchasing criteria for the average consumer (see section 6.1.4) the risk is that market demand for cheaper products may push the production or import of non-compliant products.

As mentioned above, the work of Notified Bodies would also benefit from greater consistency. Indeed, it was reported by several stakeholders that conformity assessments conducted by Notified Bodies are not always consistent across the EU: differences in the application of the test codes or in the determination of the uncertainty in relation to noise emissions measurements risk limiting the effect of the Directive.

Risk of hindering technological development

One of the objectives of the OND is to stimulate R&D to achieve lower noise emissions.

As mentioned above, the widespread use of electric engines instead of combustion engines (CE) allows reducing sound power levels for some types of equipment. At the current state of the art, this type of technology cannot yet deliver the same level of performance as combustion engines (in terms of power, autonomy, portability) and for this reason, at the moment, electric equipment is more likely to be used by leisure or casual users than by professionals.

However, despite these differences in sound power levels, electric and combustion engines equipment are subjected to the same noise limits. The ODELIA study proposed a dual system foreseeing different limits for the electric and CE versions for specific equipment types. It was however reported that setting a cap on the noise emission of electric equipment may hinder the development of products capable of offering better performance at a similar noise level of the CE version of the same equipment.

Another way the OND could have hindered technological development is by diverting resources from R&D in other technology areas to noise reduction. As discussed above, manufacturers have to balance different features when developing a product. Having to comply with the OND obliges manufacturers to destine part of the R&D budget to the reduction of noise emission possibly having to divert resources that could have been used to develop other technologies. This issue was however not reported by manufacturers and, as mentioned, it is difficult to clear identify the exact investment made in R&D on noise reduction as R&D is usually a holistic process.

6.1.13. Conclusions

Did the Directive protect the health and well-being of citizens and the environment, by reducing permissible noise levels of such equipment?

Noise emission levels of outdoor equipment have dropped over the last 20 years and it is estimated that for equipment under Article 12 this reduction is between 2 and 6 dB.

Despite this achievement, most of the equipment covered by the OND, either by Article 12 or Article 13, are above 90 dB sound power level. This means that bystanders at 25 metres of distance could be exposed to noise above 50 dB sound pressure level with potential impacts on their well-being.

Consumer behaviour also impacted the capacity of the OND to reach its objectives. A proactive attitude and more awareness could have led consumers to prefer quieter equipment pushing the market to dismiss more noisy versions. The OND provisions on their own proved insufficient to motivate consumers to buy less noisy equipment. Non-professional purchasers and users of the equipment under the scope of the Directive still lack knowledge and awareness about noise emissions and the noise label alone is not enough to drive consumer choice.

Given the low market demand for quieter equipment, in the absence of the OND, manufacturers would direct R&D investment towards those product characteristics that are more attractive to customers (e.g. performance, safety, energy efficiency). Technological developments would have driven improvements in noise emissions even without the Directive, this is the case, for example, of the electric engines. The Directive, however, forced manufacturers to invest resources in the research and development of special designs, mechanisms and strategies to reduce noise emissions of outdoor equipment under Article 12. Mostly due to the insufficiency of the label to steer purchasing behaviour, the inclusion of equipment under Article 13 was, on the contrary, not sufficient to encourage manufacturers to develop less noisy products.

Finally, shortcomings in market surveillance, mostly dependent on the lack of sufficient resources allocated to this specific area, also undermined the ability of the OND to protect the wellbeing of citizens.

Although the OND did not reach its full potential, citizens exposed to noise emission from outdoor equipment are still better off than how they would have been without the OND.

Did the Directive ensure an internal market for outdoor equipment, by preventing obstacles to the free movement of such equipment?

Before the OND came into force, seven product Directives and two procedure Directives applied to several types of equipment. The simplification applied by the OND which merged and replaced these Directives brought greater clarity to the concerned legislative framework and improved the activity of all stakeholders.

The OND is credited for having prevented the emergence of different regulations at the national level that may have hindered the intra-EU circulation of covered equipment. While there is a general agreement that the OND allowed for better trading across borders inside the EU, trade data to assess the concrete impact is scarce.

Although the OND may have prevented the proliferation of national legislation, gaps in market surveillance expose compliant manufacturers to unfair competition by their non-compliant peers, potentially undermining the level playing field.

In terms of extra-EU trade, there is no indication of a decrease in import from extra-EU countries as a consequence of the EU's stricter noise limits. On the contrary, some EU producers have to adapt their products to better match the preferences of non-EU customers by changing the design, increasing the power and even removing noise reduction elements from the products to reduce weight and increase power.

Covering many different types of equipment and versions of the same type, the classification and grouping of products currently applied might cause difficulties for manufacturers in understanding whether a product is actually covered by the Directive.

The three conformity assessment procedures foreseen by the OND address the different needs of the manufacturers well, although the lack of a possibility of self-declaration for equipment under Article 12 is seen as a constraint by some and as a guarantee by others. Notified Bodies that are competent to perform the requested procedures are not established in some countries which represents a barrier for manufacturers that have to seek the needed expertise in the other Member States.

The current test codes for the majority of the equipment covered by the OND are not in line with technological development and would need to be revised.

The lack of a clear and uniform procedure to determine the uncertainty of measurements in the OND may cause inconsistency between guaranteed power levels depending on the subject performing the measurement.

6.2. Efficiency of the Directive

This section evaluates **whether the Outdoor Noise Directive was implemented efficiently**. The evaluation questions are addressed based on information collected through the literature review, semi-structured stakeholder interviews, CATI interviews, the Open Public Consultation, and the online survey.

6.2.1. Did the Directive reduce the administrative burden for stakeholders' activities?

The administrative burden of the OND is generally related to the compliance and conformity procedures. For manufacturers producing equipment not previously covered by equipment specific Directives, the Directive **did not bring any identifiable reductions in this compliance cost**, as for most equipment in the scope of the OND, noise limits did not exist prior to the implementation of the Directive. On the contrary, the OND **introduced some new costs for manufacturers** (see sub-section 6.2.2). Regarding construction machinery, lawnmowers, tower cranes, welding generators, power generators and compressors, which were previously covered by the product and procedure Directives merged into the OND, the consulted stakeholders agreed that the merger brought greater clarity, and it provided a single reference point for both manufacturers and Notified Bodies.

For Notified Bodies and Market Surveillance Authorities, the change in administrative burden brought by the Directive was largely identified as **non-existent or minimal**[158]. However, the Notified Bodies observed that certain investments had to be made in order to perform the tasks required by the Directive, including investments in equipment, personnel training, yearly surveillance, and information and clarification acquisition and dispersal. It was noted that the costs of accreditation are a source of burden, especially where there are very few manufacturers. However, only 3% of the Notified Bodies suggested that the Directive had strongly increased their administrative burden. Similarly, handling new products and setting up teams of noise specialists can add to the burden for MSAs, yet no respondents indicated a strong increase in administrative burden. These costs naturally depend on the extent to which market surveillance takes place.

6.2.2. What administrative costs arise due to compliance and conformity procedures, and are the conformity assessment procedures effective?

For equipment listed under Article 13, the OND allows for self-certification (Annex V), while for equipment listed under Article 12, it allows for a choice between the following three types of conformity assessment procedure:

- Internal control of production with assessment of technical documentation and periodical checking (Annex VI)
- Unit verification (Annex VII)
- Full quality assurance (Annex VIII).

To follow the compliance procedures, manufacturers must have sufficient personnel resources or the ability to hire an expert, as well as knowledge, time, and financial resources.

[158] 71% of Notified Bodies (n=34) and 73% of Market Surveillance Authorities (n=12) suggested either neutral impact or an increase of 0-25% on their administrative burden.

Any equipment placed on the European market or put into service complying with the OND, whether under Article 12 or Article 13, must be CE marked, with an indication of the guaranteed sound power level. It must also be accompanied by an EC Declaration of Conformity, drawn up by the manufacturer or an authorised representative. A copy of the Declaration of Conformity must also be sent to the responsible authority in the Member State of the manufacturer, as well as to the Commission.

Table 6-5 displays the costs of self-certification by company size based on turnover. The costs increase somewhat for the bigger companies. This can potentially be explained by larger and more complicated equipment produced by bigger companies, but due to the complexity of the range of products provided by the participating companies, this could not be conclusively confirmed.

Table 6-5: Costs of self-certification according to Annex V for manufacturers per company turnover (n=276)

Company size (turnover)	Time (in days)	Cost
Less than EUR 2 million (n=85)	12	EUR 1,900
Between EUR 2 and 10 million (n=86)	11	EUR 2,100
Between EUR 10 and 50 million (n=65)	14	EUR 2,300
More than EUR 50 million (n=40)	17	EUR 3,700
Average	**13**	**EUR 2,350**

Source: CATI interviews

According to the CATI respondents (n=31), the conformity assessment according to **Annex VI costs on average EUR 2,250**, with an average turnaround of 7 days. It has to be noted that almost all respondents to this question were companies with a turnover below EUR 10 million. As it will be shown just further in this section, larger companies mostly rely on their internal quality assurance system developed in compliance with Annex VIII. As a consequence, this cost should be compared with the corresponding self-certification cost figure reported by companies in the same category.

The average cost of assessment according to **Annex VII was reported to be EUR 6,550 (around EUR 4,650 for smaller companies)**, with the average turnaround of 7 days (n=23). For both Annex VI and Annex VII, the relatively low number of responses did not allow for a meaningful segmentation by size. However, also for Annex VII more than 70% of respondents had a turnover of EUR 10 million or less.

Table 6-6 details the costs of conformity assessment according to Annex VIII (internal QA) per company turnover, including the cost of the system required. Again, the costs are higher for bigger companies.

Table 6-6: Costs of conformity assessment according to Annex VIII for manufacturers per company turnover (n=121)

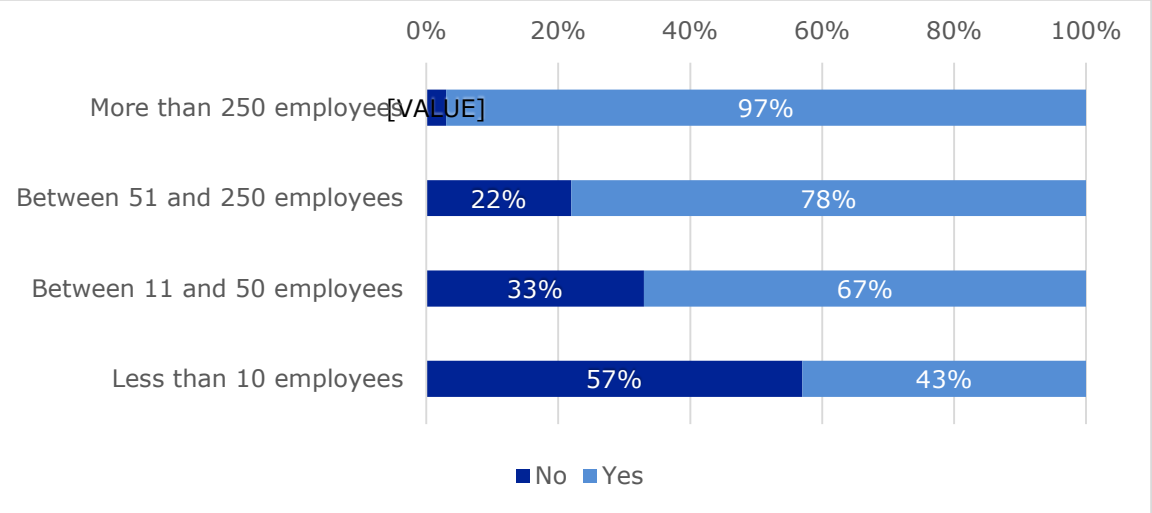
Company size	Time (in days)	Audit procedure cost on the system	QA System set-up cost
Less than EUR 2 million (n=22)	9	EUR 4,950	EUR 7,500
Between EUR 2 and 10	8	EUR 5,500	EUR 21,150

million (n=32)			
Between EUR 10 and 50 million (n=35)	6	EUR 10,450	EUR 42,600
More than EUR 50 million (n=32)	10	EUR 21,300	EUR 46,700
Average	**8**	**EUR 8,350**	**EUR 30,800**

Source: CATI interviews

Given the high implementation costs and skills required to develop and use it, access to this kind of system also increases with the size of the company. As shown in Figure 6-6 below, the bigger the company, the more likely it is that it will have developed an internal quality insurance system.

Figure 6-6: Frequency of development of an internal QA System by company size[159]



Source: CATI interviews

It is assumed that the cost of performing a measurement using the internal quality assurance system is similar to the cost of self-assessment ex Annex V. Notified Bodies also have to carry out yearly audits on the quality assurance systems[160]. Assuming the cost of this audit requirement to be a quarter of the cost of the initial cost, it would range between EUR 1000 and EUR 5,000 per year depending on the company size. All in all, over ten years it is estimated that audits on the quality assurance system cost to a company between EUR 15,000 and EUR 70,000 depending on its company size (EUR 30,000 on average).

The Notified Bodies report that the cost to the client for the procedure is up to EUR 5,000 ex Annex VI, up to EUR 2,000 ex Annex VII, and up to EUR 8,000 ex Annex VIII. However, the response rate among Notified Bodies was low and does not allow for a reliable comparison of costs.

[159] Figures by turnover match with the figures by company size.

[160] Guidelines for the application of 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 Update June 2017 - Annex VIII http://ec.europa.eu/docsroom/documents/24042.

In general, the average cost of a conformity assessment with third-party involvement has been determined by the evaluation of the Internal Market Legislation for Industrial Products. Based on a survey of 128 Notified Bodies and a programme of 201 interviews, including industry associations and companies, it identified the cost to be in the range of EUR 30,000 to EUR 50,000 per company per annum, or EUR 3,000 to EUR 4,000 per product[161].

On the basis of the estimated number of manufacturing companies producing each equipment covered by the OND (see section 5.3), it was possible to estimate the annual compliance cost[162]. It has to be noted that the estimates changes on the basis of the assumed number of measurements per year per type of equipment. CATI results indicate that, on average, a manufacturing company conducts six measurements in a year per type of equipment. This could depend, for example, on the existence of different versions of the same equipment type.

On average, a manufacturing company conducts six measurements in a year per type of equipment. Table 6-7 presents the cost range of compliance for equipment covered by Articles 12 and 13[163]. As a result, the compliance cost with the Directive ranges from EUR 18 million to EUR 27 million.

Table 6-7: Estimated total compliance costs

	Lower end	Higher end
Article 12	EUR 8 million	EUR 10 million
Article 13	EUR 10 million	EUR 17 million
Total	**EUR 18 million**	**EUR 27 million**

Source: CATI interviews

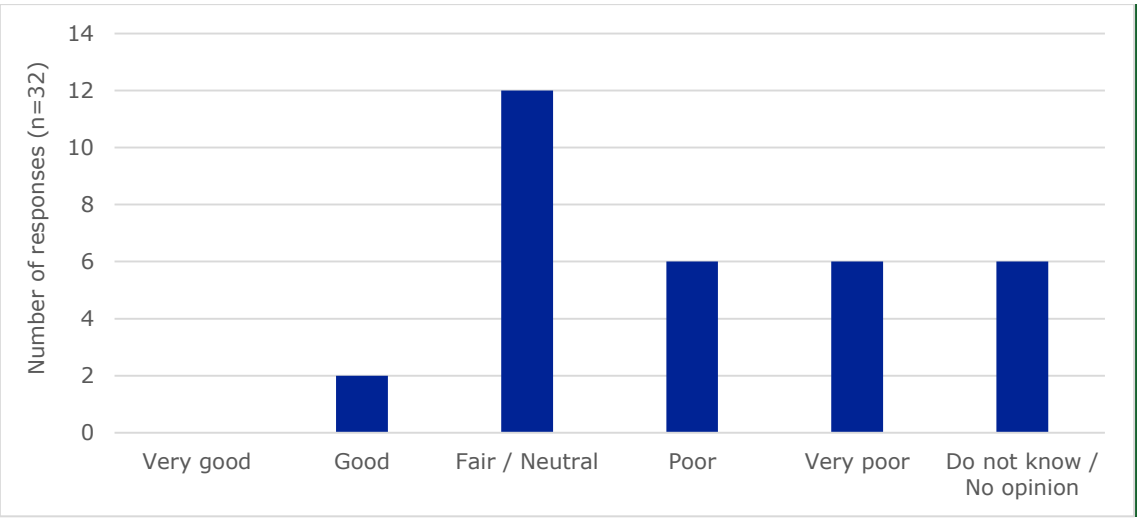
The Open Public Consultation manufacturer respondents (n=32) were asked to evaluate the conformity assessment procedures regarding implementation, administrative and information burdens. As presented in Figure 6-7, the majority **considers the procedures to be fair/neutral**.

[161] Simmonds, P., Brown, N. and Rentel, M. (2017). Evaluation of Directive 2006/42/EC on Machinery. Final report. Available at: http://ec.europa.eu/docsroom/documents/25661.

[162] The estimate does not include the following equipment types due to limitations in assessing the number of manufacturing companies: Compaction machines, Mobile waste containers, Power generators, Water pump units, Welding generators.

[163] CATI results indicate that, on average, a manufacturing company conducts six measurements in a year per type of equipment. This could depend, for example, on the existence of different versions of the same equipment type.

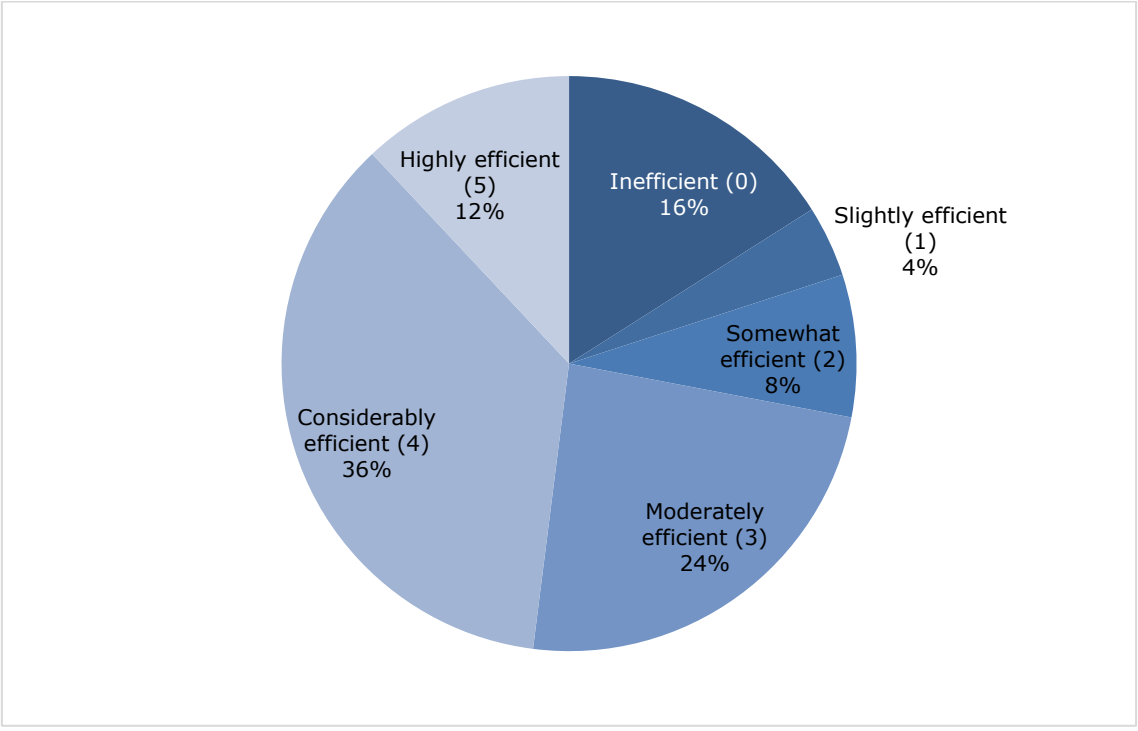
Figure 6-7: How can the conformity assessment procedures of the Directive be considered with regard to implementation, administrative and information burden



Source: Open Public Consultation

The respondents were also asked to rate the efficiency of the conformity assessment procedures on the scale from 0 to 5 on selected aspects. As presented in Figure 6-8, for the procedure according to Annex V most aspects are ranked at moderate efficiency (3 out of 5), however technical documentation is most commonly ranked considerably efficient (4 out of 5).

Figure 6-8: Efficiency of the conformity assessment procedure according to Annex V

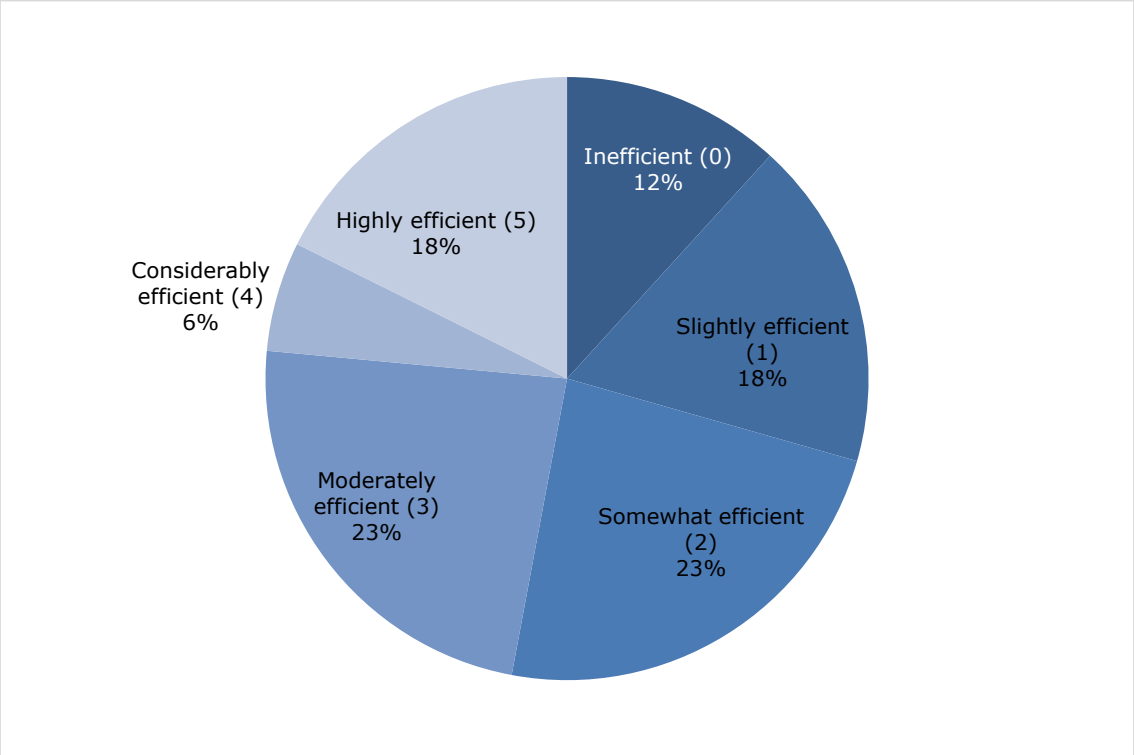


Source: Open Public Consultation

As presented in Figure 6-9 and Figure 6-10, opinions are somewhat more divided on the efficiency of the conformity assessment procedure according to Annex VI and

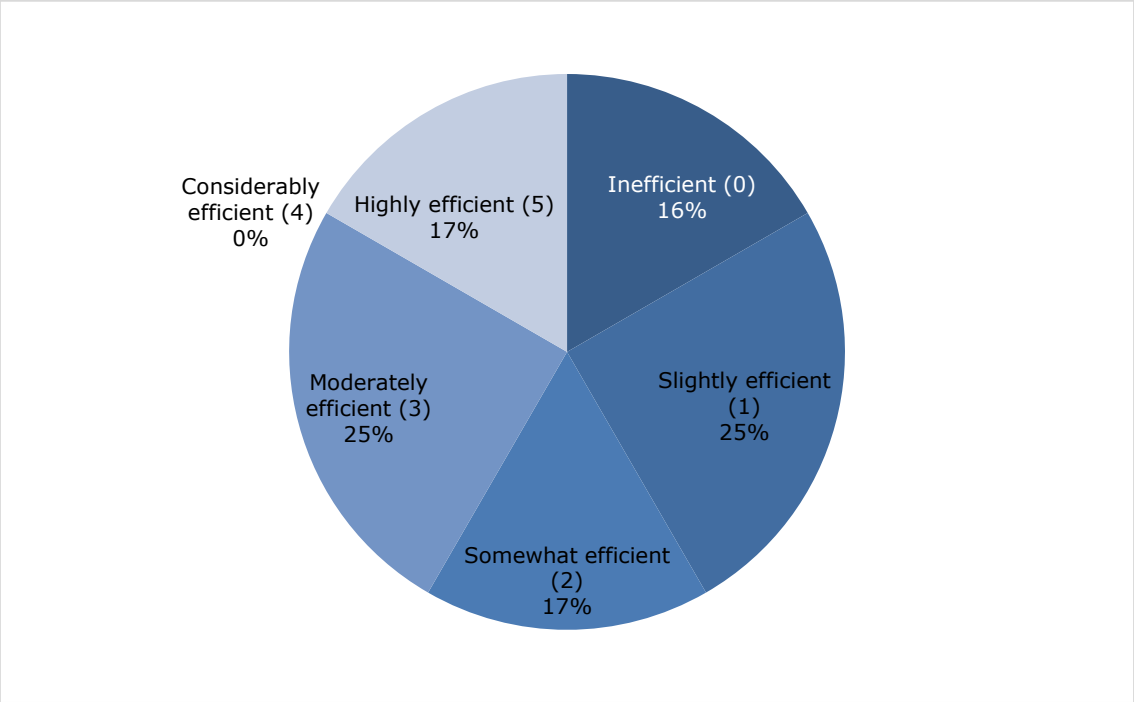
Annex VII. Annex VI is most commonly assessed as either somewhat efficient (2 out of 5) or moderately efficient (3 out of 5), with 23% each, while Annex VII is most commonly assessed as either slightly efficient (1) or moderately efficient (3) with 25% each.

Figure 6-9: Efficiency of the conformity assessment procedure according to Annex VI



Source: Open Public Consultation

Figure 6-10: Efficiency of the conformity assessment procedure according to Annex VII



Source: Open Public Consultation

Notified Bodies and Market Surveillance Authorities considered that providing the choice between different conformity assessment procedures is an adequate way to balance the need for noise limits with flexibility for industry[164], without creating confusion or unnecessary difficulty[165].

Most of the consulted stakeholders consider that **the overall costs for manufacturers from following the requirements of the OND are proportionate to the benefits gained** by the Directive, as long as they are sufficiently and equally enforced. However, the gaps in surveillance and enforcement (see section 6.1.5) means that some manufacturers can get away with not complying, and therefore avoid the related costs. This undermines the level playing field in the single market, putting compliant manufacturers at a competitive disadvantage due to the investments they have made to comply.

There is **disagreement among different stakeholder groups regarding whether the current third-party conformity assessment procedures should be replaced by a self-assessment**. Manufacturer representatives consider the self-assessment a more efficient way of quality assurance with lower costs, while consumer organisations, Notified Bodies and Market Surveillance Authorities consider that it would be less reliable than third-party certification, leading to negative impacts for consumers and the environment. These stakeholders expressed the view that the third-party conformity assessment acts as the first line of control to ensure that non-compliant products do not reach the market. In addition, according to the preliminary analysis of the Open Public Consultation, 49% of the respondents felt that self-

[164] 68% of the Notified Bodies (N=34) and 91% of the Market Surveillance Authorities (N=11).
[165] 62% of NBs and 73% of MSAs disagreed with the statement "by providing a choice between different conformity assessment procedures, the Directive creates confusion and makes it more difficult for companies to get their products approved".

assessment should be used in very limited cases only or be removed entirely as a conformity assessment procedure. Therefore, **the need to minimize costs needs to be carefully balanced against the reliability of the information provided to the buyer, as well as ensuring the level playing field on the single market, especially where market surveillance is insufficient**.

6.2.3. Is participation in the Committee resource efficient in comparison to benefits obtained?

Articles 18 and 19 of the OND foresee the establishment and the operation of a Committee to assist the Commission and, where necessary, to adapt the methods of measurement of airborne noise emitted by equipment for use outdoors (Annex III, referring to the "basic noise emission standards" and "general supplement to basic noise emission standards" or "test codes" for specific equipment with European and international standards) to the technical progress. **This Committee was set up in 2004** with its Rules of Procedure (modified in 2011) but it was rarely convened, as **the main sector-related activities are carried out in the Outdoor Noise Working Group**, integrated by the representatives of Member States as well as those from EU-wide stakeholders (standardisation, Notified Bodies, industry, users' associations, etc.). The efficiency of such participation could be evaluated in terms of the results achieved by the Working Group to ensure the smooth and coherent implementation of the Directive throughout the EU. In particular, the "Guidelines for the application of Directive 2000/14/EC", issued for the first time in 2002 and lastly updated in 2017, includes the common approaches and agreements reached in the Working Group as practical guidance for all the sectoral interested parties. Moreover, an estimation of the perception of the efficiency of participation in the Committee Working Group by its members can be made through the rate of attendance of representatives of Members States, EEA/EFTA/CU, Coordination of Notified Bodies, European Standardisation Organisation, Industry associations and others to the meetings held since 2005, as displayed in Table 6-8.

Table 6-8: Rate of attendance of the Working Group

Date of the meeting	Member States	EEA/EFTA/CU countries	Notified Bodies	Standardisation	Industry associations	Others
21 March 2005	14		1	1	3	2
26 October 2005	19		1	1	7	1
16 May 2006	17	1	1	1	7	
21 July 2007	15	1	1	1	4	1
21 January 2008	21	2	1	1	7	2
10 September 2008	26	3	1	1	7	
27 November 2008	18	2	1	1	6	2
8 January 2009	16	3	1	1	5	2
15 May 2009	17	3	1	1	8	3
16 July 2009	20	2	1	1	8	3
2 October 2009	16	2	1	1	6	
1 February	19	3	1	1	8	3

2010						
15 April 2013	12		1	1	3	1
11 March 2014	12		1	1	3	
16 February 2015	14		1	1	4	
20 October 2015	14		1	1	6	
30 September 2016	15		1	1	6	
23 January 2018	17	1	1	1	5	2

Source: European Commission

On the other hand, neither the Committee nor the Working Group have so far used the procedure laid down in Article 18a to adapt Annex III to technical progress. As discussed in section 6.1.9, the measurement methods and test codes based upon European and international standards have therefore not been updated since the entry into force of the Directive itself and are no longer up-to-date with the technical progress of the last 20 years. More than a third of the manufacturers that responded to the Public consultation reported **a low degree of satisfaction with this specific aspect of the conformity assessment, indicating that the procedures are poorly adapted to technical progress** (38%, n=10). Therefore, it seems that there is a clear need for an effective procedure in the Committee, or another alternative procedure, for updating the basic noise emission standards and the noise measurement methods and test codes for specific equipment, when necessary, according to the technical progress and the "state of the art".

6.2.4. Did the Directive introduce unnecessary burdens for manufacturers and other economic operators?

While the focus of the OND is controlling the noise emissions of outdoor equipment in the environment, the limits and requirements mainly impact manufacturers and other economic operators. Therefore, **the benefits and costs brought by the Directive fall largely on different stakeholder groups**. The Open Public Consultation respondents familiar with the Directive (n=150) considered that some excessive administrative burden had been brought by the implementation of the Directive[166], particularly by the third-party certification and reporting. The respondents considered that these requirements, particularly providing information for the database, do not generate any environmental or health benefits.

Some of the consulted stakeholders did express the opinion that **some increase in burden compared to the pre-OND era is acceptable, as no benefits will be achieved without some investment in compliance and conformity processes**. Most stakeholders acknowledge that the OND has had a positive impact on the overall reduction of noise limits (see section 6.1.2).

Table 6-9 presents the view of the CATI respondents on how the noise performance impacts the final price of the product as paid by the customer. Across all sectors, **for more than half of the respondents, the noise performance makes no impact on the final price**. In these cases, the burden introduced by the Directive is not

[166] 46% of the respondents considered that the implementation of the OND caused excessive administrative burden "to a small or moderate extent", and 23% "to a large of very large extent".

passed on to the consumer. Considering that noise performance has not been identified as a strong purchase driver (see section 6.1.4), it is probable that consumers would choose the cheaper, noisier product. Thus, the price increase would not be an effective way to recover the costs. However, it is also noticeable that in specific sectors the impact on price is more evident. Notably this is the case for cleaning equipment, power generators and cooling equipment, and waste collection, processing and recycling equipment. This seems in line with the findings reported in section 6.1.4. Cleaning and waste collection, processing and recycling equipment are typically **needed by public and local authorities to provide related services to their citizens**. As mentioned, this type of customer is more interested in less noisy equipment in order to perform these activities during the night. Power generators are often used in **specific contexts where excessive noise can be problematic**. This is the case for example of movie sets where power generators are used while filming, hence the need for more silent equipment. In this case, being a valuable feature of the equipment, lower noise emission has a stronger impact on the final product price.

Table 6-9: Impact of noise performance to the price paid by the final customer - CATI

	No difference	Increase of 5%	6% - 10%	11% - 25%	26% - 50%	> 50%	Cheaper for customers
All sectors	57%	17%	14%	9%	1%	0%	1%
Cleaning	**44%**	16%	20%	12%	4%	4%	0%
Construction	59%	19%	15%	4%	1%	0%	1%
Gardening	54%	14%	21%	7%	0%	4%	0%
Loading and lifting	63%	14%	15%	5%	1%	0%	1%
Power generators and cooling	**35%**	18%	20%	20%	3%	0%	3%
Pumping and suction	59%	17%	8%	11%	3%	1%	1%
Snowmobiles and snow groomers	33%	0%	67%	0%	0%	0%	0%
Waste collection, processing and recycling	**40%**	23%	10%	27%	0%	0%	0%

Source: CATI interviews

Manufacturing companies responding to the OPC (n=32) also gave the impact of noise performance to the final price of their equipment. For two-thirds of the respondents, the increase falls between 1 and 20 per cent.

Table 6-10: Impact of noise performance to the price paid by the final customer - OPC

No difference	Increase of 1-20%	Increase of more than 20%	Cheaper for customers	Do not know / No opinion

13%	66%	13%	0%	9%

Source: Open Public Consultation

55% of the manufacturers participating to the OPC (n=32) reported that information on noise emission level is a criterion offered to and required by the customers, 44% reported that the information is offered but not required, and 6% that it is neither.

The NOISE database managed by the EC and filled in by manufactures **is not currently considered particularly usable by the manufacturers** (see section 6.1.11). Even after a switch was made from input based on paper documents to a digital document that can be pre-filled, the manufacturers still find the method outdated and feel that a more up-to-date, automated option should be available to save time and effort. The sense of unnecessary burden is further accentuated by the fact that the data contained in the database is currently not in a readily usable format, and stakeholders expressed doubts about the reliability of the data. It was noted that were it more usable and functional, the database could be an important tool in addressing noise levels, but **if sufficient improvement is not achieved, many respondents, manufacturers in particular, would rather see it removed altogether**.

The Machinery Directive 2006/42/EC[167] (MD), which contains a set of requirements to reduce noise emission in the design and manufacturing of products, is based on the New Approach Legislation and makes use of harmonised standards. Unlike the OND which addresses the sound power level, the MD addresses sound pressure levels to limit the moderator noise exposure. These differing requirements between the OND and the MD, as well as the OND and some product specific standards, were seen by stakeholders as another source of unnecessary burden. **The divergence in measurement methods and test codes of the OND and the MD means that for equipment covered by both Directives, manufacturers have to perform two different types of tests to achieve compliance with both**. The conformity costs of the OND are detailed above. Many of the consulted stakeholders felt that this kind of duplicated costs could be avoided by harmonising the two Directives.

6.2.5. Were burdens placed on the industry levelled off or exceeded by the benefits of increased trading across Europe?

As discussed in section 6.1.10, there is a **general agreement that the OND allowed for better trading across borders inside the EU**, but data is scarce. While the OND is credited for preventing the proliferation of different national noise standards (see section 6.1.1), it is difficult to assess whether this has led to an increase of international trade.

As described in section 6.1.10, intra-EU trade data for the period of 2000-2007 shows that equipment covered by Articles 12 and 13 had **better trade performance than the equipment outside the scope**, increasing more constantly over time. However, this could depend on different factors (e.g. market trends, sector specific developments as most of the trade data concerned the construction sector), including the fact that the OND avoided the rise of different national regulations. The 2008 economic crisis had a significant impact on the market, making it extremely difficult to identify the market trends over the period of 2007-2018.

According to the majority of the CATI respondents, **the OND did not have an observable impact on the respondents' business either in their home country,**

[167] http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32006L0042.

in the EU market or outside the EU (see section 6.1.10 for details). Manufacturers responding to the OPC (n=32) also suggested that no particular market benefits were experienced. 50% reported that the increase in market opportunities created by harmonised European noise limits does not exceed the costs, against 16% who did and 34% who presented no opinion. On whether having the same noise limits across the EU/EEA actually increased competitiveness and/or market opportunities the OPC respondents were divided, with 47% reporting that competitiveness/market opportunities did not increase and 41% that they did (13% presented no opinion).

6.2.6. Are there elements of the Directive that require more resources (manpower, time, etc.) in comparison with others?

R&D costs and third-party conformity assessments are identified by the stakeholders as the most expensive and time-consuming elements of the Directive. The costs of the third-party conformity assessment are discussed in section 6.2.2.

Out of the 150 respondents to the OPC that are familiar with the OND, 56% considered that the Directive had had a positive effect on research, development and innovation on equipment. It was, however, observed that noise limits need to be feasible and sufficiently ambitious to stimulate innovation and improve noise performance.

The lack of consumer interest in noise performance was considered an inhibiting factor on the manufacturers' motivation to invest in noise R&D. Indeed, the lack of a competitive advantage in relation to noise performance, in combination with the conflict between noise limits and other requirements (such as exhaust emissions), was seen as a negative factor for noise-specific R&D, and the consequent R&D expenses to be disproportionally high on compliant enterprises.

The 2017 EU Industrial R&D Investment Scoreboard[168], according to which the average R&D intensity (R&D as a percentage of net sales) in the relevant sectors is about 5%[169]. This figure was confirmed by the CATI interviews, it is estimated that about 5% of the turnover is spent on overall R&D with small differences across the different sectors[170].

As mentioned in section 6.1.8, it is difficult for stakeholders to indicate the amount of R&D spent on noise reduction. R&D budgets are usually more holistic and include many other product features on top of noise emissions. As such, any data on this specific aspect needs to be considered with caution. Based on CATI responses it is estimated that between 2.5% and 7% of total R&D expenditure is spent on noise reduction (see section 6.1.8)[171]. Interestingly, manufacturers of cleaning equipment and Power generators and cooling tend to invest more than producers in other sectors, 7% and 5% on average respectively against 3.5% of average for the other sectors.

The estimated expenditure on R&D on noise reduction ranges between EUR 40 million and EUR 120 million. Table 6-11 provides the average value per sector. It has,

[168] 2017 EU Industrial R&D Investment Scoreboard, European Commission, JRC/DG RTD, http://iri.jrc.ec.europa.eu/scoreboard17.html . Accessed on 27/04/2018.

[169] Sectors considered: Automobiles & Parts, Electronic & Electrical Equipment, General Industrials, Industrial Engineering

[170] AAA The median answer shows that companies spend up to 10% of turnover on R&D. Taking the mid-point of the range 0% to 10% leads to a point estimate of 5%.

[171] It should be noted that the specific question in the CATI survey asked about expenditure for noise related R&D as a share of turnover. However, this question was asked immediately after the question on overall R&D and it appears most respondents indicated the percentage of noise related R&D in total R&D. As consequence answers to this question were analysed as percentage of the total R&D budget.

however, to be considered that this value is not constant over the years and it follows the production cycle. Also, some of the investment in R&D on noise reduction is not borne by companies but passed on to the consumers. This means that the cost is also spread among the final users of the equipment, especially in cleaning equipment, power generators and cooling equipment, and waste collection, processing and recycling equipment categories (see section 6.2.4). For example, it is estimated that about 17 million units of gardening equipment have been sold in 2017. This would mean that, on average, EUR 0.50 have been passed on to each customer to cover R&D cost related to noise reduction.

Table 6-11: Estimated expenditure in R&D as share of sector turnover[172]

	Estimated turnover	R&D Expenditure	R&D on noise reduction expenditure
Cleaning equipment	EUR 1 billion	EUR 48 million	EUR 4 million
Construction machinery	EUR 21 billion[173]	EUR 1 billion	EUR 31 million
Gardening equipment	EUR 4 billion	EUR 200 million	EUR 8 million
Loading and lifting equipment	EUR 7 billion	EUR 300 million	EUR 10 million
Power generators and cooling equipment	EUR 3 billion	EUR 130 million	EUR 8 million
Pumping and suction equipment	EUR 1.5 billion	EUR 70 million	EUR 3 million
Snowmobiles and snow groomers	EUR 0.2 billion	EUR 10 million	EUR 0.3 million
Waste collection, processing and recycling	EUR 2.5 billion	EUR 120 million	EUR 3 million
Total	**EUR 40 billion**	**EUR 1.8 billion**	**EUR 67 million**

Source: CATI interviews

The third-party conformity assessments are also somewhat resource consuming for Notified Bodies, who suggested that inspectors have to demonstrate stricter requirements than for other Directives, and uncertainties need to be fully evaluated for Article 12.

6.2.7. Are SMEs disproportionately affected by the Directive's requirements in comparison to larger enterprises?

Fixed compliance costs can be expected to have a larger impact on SMEs, as due to smaller sales volumes they have a more significant impact on the company finances, and due to smaller personnel numbers and other non-financial resources, it can be more difficult for SMEs to meet new and stricter requirements. Based on the CATI interviews, for the majority of manufacturers, the improved noise performance

[172] To be considered as an indicative value.
[173] The ARCADIS Impact Assessment Report (2009) estimated a sector 'annual turnover of about 31 billion Euros, two thirds of which were earthmoving equipment. Concrete equipment (mixers and pumps) accounted for 10%, crushing and screening equipment for 7% of total turnover'.

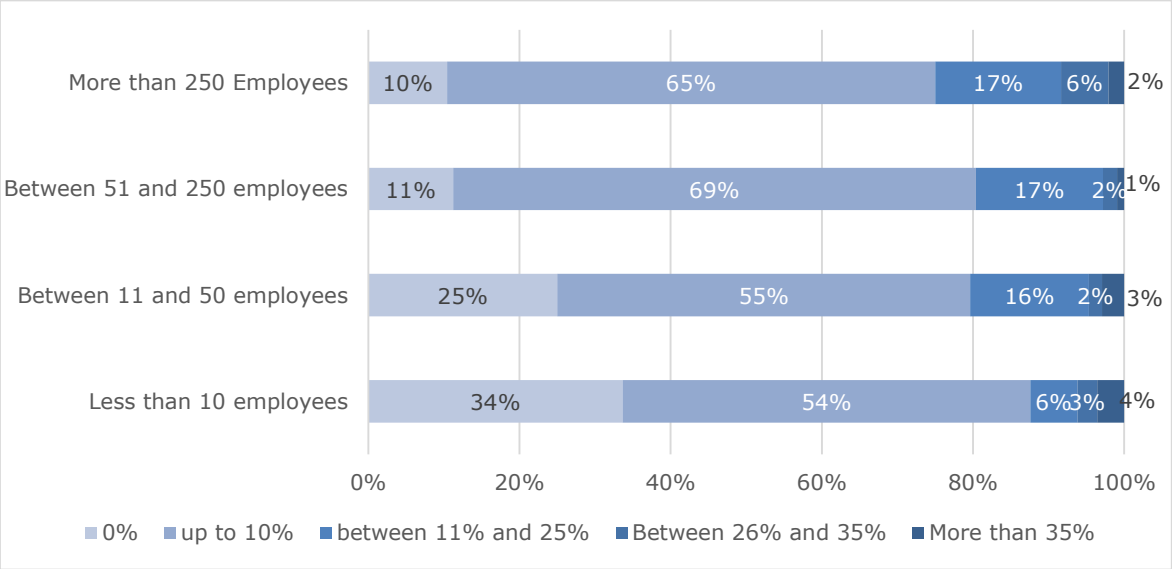
also does not significantly impact the price of the product, meaning that **there is no direct return of the investment made from the sales**[174].

As discussed in section 6.2.2, having to obtain the certificate of conformity by Notified Bodies implies costs in terms of economic, time and administrative resources. While bigger companies may be able to get a better deal with the conformity assessment (e.g. by having internal laboratories and quality assurance procedures), smaller companies may experience higher administrative costs and delays to the production.

As noted in section 6.2.2, the smaller the company, the less likely is it that they have developed an internal quality assurance system (Figure 6-6).

Regarding R&D costs, the consulted stakeholders noted that **larger companies have more resources to allocate to R&D. It was also suggested that larger companies have larger sales volumes, making it easier for them to compensate for increased R&D expenses**. They are also more likely to have access to experts and laboratories. In addition, SMEs have less control over their suppliers, leading to less control of components and tools, and therefore higher design costs. Figure 6-11 presents the R&D costs on noise reduction as a percentage of total R&D cost per company size.

Figure 6-11: Expenditure on R&D on noise reduction (as % of total R&D expenditure) by company size (N=440)



Source: CATI interviews

Overall, **stakeholders did not have a unanimous opinion on whether the OND has had an effect on SMEs' ability to compete** in the market, with 22% of the Open Public Consultation respondents suggesting no effect, 15% suggesting negative to strong negative effect, 16% suggesting positive to strong positive effect, and 47% expressing no opinion[175].

[174] 55% of manufacturers responding to the CATI interviews indicated no difference in price paid by customers, as opposed to 16% indicating an increase of up to 5%, and 13% an increase between 6% and 10% (N=440).

[175] N=150

53% of the manufacturing companies that participated to the OPC (n=32) thought that SMEs are disadvantaged both by the efforts they have to put into complying with the noise limits, and the need to follow the third-party conformity assessment procedure set in the OND, in comparison to larger enterprises. 28% and 22% respectively disagreed. **The third-party conformity assessment costs, in particular, were again highlighted as particularly difficult for the SMEs to bear**. However it was pointed out that SME-produced equipment has the same health impacts as machines produced by larger companies, and thus the testing procedures need to be comparable. It was also observed by one stakeholder that while SMEs may struggle to employ noise experts full-time, they could still hire consultants only when needed, reducing, therefore, the related cost.

6.2.8. Could the strategic objectives of ensuring an internal market for outdoor equipment and protecting the health and well-being of citizens be achieved at a lower cost?

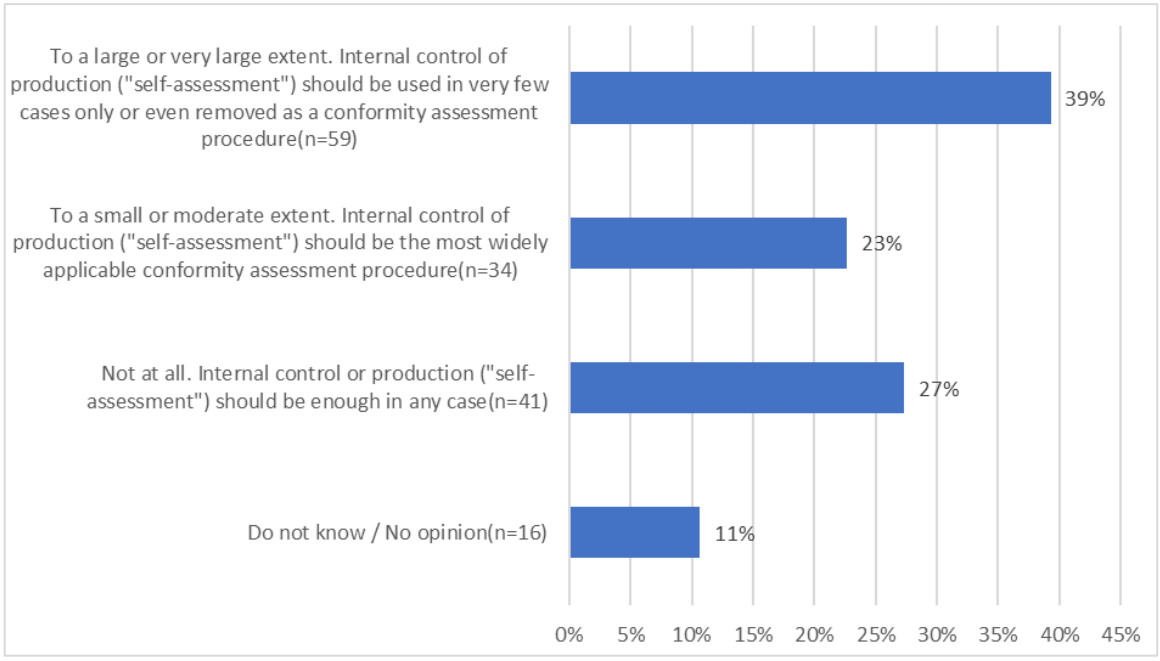
Switching to self-assessment is seen as a potential way of meeting the goals of the OND at a lower cost, as it would eliminate the costs involved in third-party certification. Sector organisations recognised that when the OND came into force companies did not have the required knowledge to perform the measurement nor the needed equipment, thus the need for the Notified Bodies and the different procedures. However, the same stakeholders affirm that the situation has changed radically, and now manufactures (SMEs and large enterprises) have the skills to do the measurements in-house and would be ready to move to a system based on self-certification.

The CATI interviews conducted with manufacturers seem to support this statement as the majority of respondents have developed an internal quality assurance system (68% (n=145) of 212 manufacturers interviewed that produce equipment covered by Article 12 of the OND).

Other stakeholders, however, especially consumer and environmental organisations, Market Surveillance Authorities, Notified Bodies themselves, as well as some sector organisations, consider third-party certification to be the most reliable option and a **requirement to guarantee a level playing field in the single market.** Several stakeholders, however, expressed concerns about the quality and reliability of measurements performed by some NBs, suggesting that there should be more effective controls on their activities.

Opinions expressed through the public consultation are representative of this diversity of views. An equal mix of different stakeholders (private individuals, sector organisations, public authorities, sector experts, etc.) support both positions which confirms the complexity of this dialogue (see Figure 6-9).

Figure 6-12: Q47. Do you think that third party conformity assessment procedures (with the intervention of a Notified Body) contribute to ensure that only compliant products are placed on the EU/EEA market?



Source: Open Public Consultation

The diverging test methods between the OND and the Machinery Directive is also a source of costs for the manufacturers (see sections 6.1.9, 6.2.4 and 6.4.1). The cost of self-assessment according to the OND is estimated at EUR 2,350 and a turnaround time of 13 days. While the costs of noise measurement according to the MD are not known,[176] we can assume **duplicate costs for duplicate measurements**.

As discussed in sections 6.1.11 and 6.2.4, while no quantification of the costs is available, the NOISE database is currently considered a somewhat unnecessary administrative burden, as the user interface is found unsatisfactory, the management of company profiles and registered equipment complicated, the quality of data uncertain, and the database structure difficult for the purpose of tracing the history of each model. The stakeholders are of the opinion that **the database should either be improved to make the relevant costs worthwhile or, alternatively, the obligations related to the database should be scrapped**.

In general, 56% of manufacturers responding to the OPC (n=32) expressed the opinion that health and well-being of citizens could not have been protected at a lower cost, and 50% that the internal market could not have been ensured at a lower cost with respect to noise reduction efforts, against only a 22% and 34% respectively[177]. In addition, 47% were of the opinion that the improvement in reduction of noise emissions produced by the Directive does not exceed its compliance costs[178].

[176] The Evaluation of the Machinery Directive in 2017 estimated the annual average cost of all MD self-assessments to be around 48 FTE days and EUR 3,600 in additional costs, however some respondents in the study highlighted noise measurements as particularly expensive.

[177] 19% and 16% respectively presented no opinion

[178] While 16% thought that the improvements do exceed the compliance costs, and 38% presented no opinion.

6.2.9. Conclusions

Was the Directive implemented efficiently?

Table 6-12 below presents the mapping of all costs and benefits of the OND identified in this study. Of the main benefits, the health and environmental benefits are the most obvious and significant. The monetised benefits total at **EUR 1463 million for the period 2000-2017, or on average EUR 86.1 million per year**.

The benefits from trade are more difficult to calculate, due to the large number of influences on the sector over the past 17 years. While the stakeholders observe the positive impact of ensuring harmonised regulation within the EU and express some concern over the effect of stricter noise limits inside than outside the EU, they do not perceive significant impact on their business in terms of internal or external trade. Increased noise performance is also commonly not reflected in the final price of the product, which means that **the costs of the Directive are largely borne by the manufacturers**.

The conformity assessment costs are identified as one of the most significant costs to the manufacturers. Assuming that the manufacturers conduct six tests per equipment type (CATI respondent average), the annual cost range is EUR 8 million to EUR 10 million for equipment under Article 12 and EUR 10 million to EUR 17 million for equipment under Article 13, totalling at **EUR 18 million to EUR 27fartcl million**.

The conformity costs are increased for companies that have to test separately for both OND and other Directives, most commonly the Machinery Directive. **Harmonising the assessment method between these two Directives** was seen as a potential simplification opportunity. Another such opportunity, favoured by many of the industry associations, would be **to switch to self-certification also for Article 12 products**. However, many other stakeholders consider that this would endanger the level playing field. The level playing field is already considered threatened by the insufficiencies in market surveillance and enforcement, and many stakeholders see the third-party conformity assessment as an additional measure for ensuring compliance on the market, and consequently the benefit of investing in compliance for the companies. Therefore, a balance must be found between simplification and ensuring compliance.

The NOISE database, while not particularly costly in terms of monetary spending, is considered burdensome due to both cumbersome input and not entirely reliable output. **Improving the database** could thus be seen as another opportunity for simplification.

Research and development is another expensive element of the Directive, with the estimated annual costs of approximately **EUR 40 million to EUR 120 million**.

Table 6-12: Overview of identified costs and benefits of the OND

Type of cost/ benefit	Description	Citizens/Consumers		Businesses		Administration	
		Qualitative	Quantitative / monetary	Qualitative	Quantitative / monetary	Qualitative	Quantitative / monetary
Environmental and health benefits	• Changes in noise emission levels • Environmental benefit • Continuous benefit	• High positive impact • Sources: Desk research, TNO calculations	• Reduction of noise emissions, between 2 and 6 dB for equipment in Article 12, approximately 1 dB for equipment in Article 13 • EUR 86.1 million / year	• N/A	• N/A	• N/A	• N/A
Intra-EU trade opportunities	• Increase in cross-border sales • Economic benefit • Continuous benefit	• N/A	• N/A	• Easier cross-border trade within EU, due to harmonised rules • Sources: Desk research, stakeholders	• Minor positive impact	• N/A	• N/A
Extra-EU trade opportunities	• Increase in cross-border sales • Economic benefit • Continuous benefit	• N/A	• N/A	• More difficult cross-border trade, due to different / lack of noise limits outside EU • Sources: Desk research, stakeholders	• Minor negative impact	• N/A	• N/A

Increased final price to the customer	• Reflection of noise performance in final price • Indirect cost • Economic cost • Recurring cost	• Negligible to low negative impact • Sources: Stakeholders	• Minor increase in final price of the product (see 6.2.2 for detailed breakdown)	• Negligible to low impact • Sources: Stakeholders	• Minor increase in final price of the product (see 6.2.2 for detailed breakdown)	• N/A	• N/A
Conformity assessment	• Costs of performing conformity assessment • Economic/staff costs • Compliance cost • Recurring cost	• N/A compliance	• N/A	• High negative impact • Sources: Stakeholders, VVA calculations	• EUR 18 million to EUR 27 million / year	• Negligible to low negative impact • Sources: Stakeholders	• Investment in equipment • Investment in personnel training • Yearly inspections • Information acquisition and dispersal
R&D costs	• Investments in developing products with lower noise emissions • Indirect cost • Economic/staff costs • Compliance cost • Recurring cost	• N/A	• N/A	• High impact • Sources: Stakeholders, desk research, VVA calculations	• EUR 40 million to EUR 120 million / year	• N/A	• N/A
Costs from overlap with other Directives / Regulations	• Costs of testing twice with different methods • Direct cost • Economic/staff cost • Recurring cost • Unexpected cost	• N/A	• N/A	• Medium negative impact • Sources: stakeholders, desk research	• Double cost of conformity assessment • Time taken	• N/A	• N/A

6.3. Relevance of the Directive

This section assesses the relevance of the OND based on the literature review, the interviews, the CATI survey and the online survey.

6.3.1. Was the Directive relevant to the needs of the users and the environment?

Exposure to noise can be hazardous and lead to significant health problems for the people exposed. Such problems include stress, sleep disturbances and cardiovascular issues[179]. Any prolonged exposure can also result in hearing impairment or in hearing loss[180]. In 1996, the press release[181] of the European Commission accompanying the launch of the Green Paper on Future Noise Policy[182] mentioned that the same year, 80 million EU citizens (about 20% of the total EU population in 1996) were suffering from noise levels that disturbed their sleep and caused annoyance and psychological symptoms. In addition, 170 million EU citizens were living in so-called grey areas, where the noise levels cause serious annoyance during the daytime.

Although transportation noise usually accounts for one of the main sources of noise affecting health, neighbour noise and industrial noise, which makes up an important part of noise from outdoor equipment, are also important sources of noise. **While there is legislation protecting workers exposed to noise (e.g. the Machinery Directive in the EU), private users or people exposed to noise do not always benefit from the same level of protection.**

The OND aims to fill this gap by providing a common framework for the Member States to tackle harmful noise. One of the main objectives of the Directive is to reduce the number of persons affected by noise in the EU. The OND has a clear role in limiting excessive noise for equipment in Article 12, and at least incentivising quieter equipment in Article 13.

Noise affects not only public users but also the environment. Cities, in particular, are highly affected by noise pollution due to the growing urbanisation, traffic congestion and construction. The European Commission already identified noise pollution as one of the most significant problems in urban areas across Europe in its Fifth Environmental Action Plan in 1993[183]. The OND was introduced with the specific aim to lessen the noise impact on the environment and especially in urban areas[184].

As discussed in section 6.1.3, the sound power levels established by the OND are still above the threshold marked as safe for health and well-being suggesting that at the time the Directive came into force, noise emissions were even higher and therefore more dangerous for EU citizens.

[179] NCTC (2010). Activities of the CAETS Noise Control Technology Committee. Available at: http://www.aph.gov.au/DocumentStore.ashx?id=c174eb07-244e-4bd1-8bef-364efdd1776d.
[180] Ibid.
[181] European Commission (1996) Press release on the Green Paper on Future Noise Policy. Available at: http://europa.eu/rapid/press-release_IP-96-981_en.htm
[182] COM(96) 540 final. Available at: http://aei.pitt.edu/1204/1/noise_gp_COM_96_540.pdf
[183] European Commission, (1993). A European Community programme of policy and action in relation to the environment and sustainable development. Available at: http://ec.europa.eu/environment/archives/action-programme/env-act5/pdf/5eap.pdf
[184] European Commission (2018). Noise emission by outdoor equipment. Available at: http://ec.europa.eu/growth/sectors/mechanical-engineering/noise-emissions_fr

6.3.2. Is the Directive still relevant to the needs of the users and the environment?

As mentioned in the previous sections, one of the OND's objective is the protection of the environment and the well-being of users. Despite the OND, noise levels can still be an issue for public health[185]. 17 years after the introduction of the OND, the growing urbanisation and the subsequent increase in construction of road and building infrastructures has led to the use of more outdoor equipment and, therefore, also noise[186]. Both stock numbers and work automation have increased. Especially consumer equipment has undergone a massive increase in numbers thanks to low-cost products available on the internet and in supermarkets. This increase in the number of equipment on the market and in use is felt to have counterbalanced the positive effect of the Directive in reducing noise emission levels.

While noise emissions do not necessarily always damage health, they can result in annoyance for citizens. The well-being of citizens related to annoyance is less well defined than concrete health impacts but can be linked to all of the OND equipment types. The most immediate effects of outdoor equipment noise are annoyance, stress, concentration loss and loss of productivity, lack of rest and loss of rest time[187]. Good examples are noise from garden tools effectively diminishing rest and recovery time for others exposed, but also construction and maintenance works directly outside the office, hospitals, schools or dwellings.

According to several interviewees, certain sources of noise are more likely to expose users to high noise emissions and to result in annoyances or hazardous effects on citizens' health. In particular, several local environment offices have pointed out that **construction and demolition areas are the greatest sources of noise in relation to outdoor machinery**, followed by community and neighbour noise. Construction sites tend to expose more people to noise, especially because for certain kinds of equipment, such as hydraulic excavators, hydraulic hammers, pumps (which often need to be running 24 hours a day), and pile drivers, the process noise is predominant. In such cases, the impact of machine noise reduction is limited due to process noise. A few interviewees also drew the attention towards public works, as they often tend to take place during the night in order to avoid traffic congestion. In these cases, it is even more important to adopt measures to protect citizens and reduce exposure to noise.

A significant share of the interviewees stressed that **neighbour[188] and community noise[189] are relevant categories when it comes to complaints**. The number of yearly complaints reported by interviewees varies drastically (from a few dozens to hundreds), but it has to be considered that these numbers are low estimations. Not all interviewees were able to report exact numbers of complaints due to the lack of statistics, and those who provided a number highlighted that many complaints are not

[185] Some national consumer and environmental organisations still express their concerns with regards to exposure to noise.

[186] Passchier-Vermeer, W and W F Passchier (2000). Noise exposure and public health. Environ Health Perspect. 2000 Mar; 108(Suppl 1): 123–131.

[187] NCTC (2010). Activities of the CAETS Noise Control Technology Committee. Available at: http://www.aph.gov.au/DocumentStore.ashx?id=c174eb07-244e-4bd1-8bef-364efdd1776d.

[188] This was confirmed by the Open Public Consultation. To the question "Which type of the following activities causing noise from outdoor equipment are you exposed the most to?" 90% of the participants indicated neighbour noise from gardening tools, followed by community noise -56%- and construction noise -27%-. About 86% of the participants to the open public consultation indicated that the area in which they are the most exposed from outdoor equipment is the domestic environment which confirm the importance of neighbour noise.

[189] Again, the results from the open public consultation confirmed the importance of community noise. About 47% of the participants indicated being aware of more than 100 cases/year, without being directly exposed, where outdoor equipment is the cause of significant issues for community noise.

registered (e.g. when they can be easily solved). Finally, it was also mentioned that in **many cases it is not the noise per se that is problematic, but disrespectful behaviour in the use of the tools**. This is, of course, a bigger issue in those sectors characterised by the existence of a larger number of equipment destined to private users (e.g. gardening equipment), while it is less of a problem when it comes to machines developed for professional use (e.g. construction equipment).

In the professional sectors linked to these sources of noise, in particular construction, gardening and waste collection industries, noise emissions are still reported to be at a sensitive level for workers and are sometimes higher than the 80 dB(A) threshold above which preventive measures should be taken in workplaces. Although workers' exposure is out of the scope of this study, the noise emitted by the equipment used in these industries is likely to impact EU citizens, especially in urban areas. Construction activities were already mentioned as one of the most sensitive areas regarding the level of noise affecting citizens. Workers in the gardening sector, in particular, grass-trimmer operators, are also often exposed to a sound level of the order of 100/105 dB(A). The combined level of noise of different operators operating simultaneously tends to worsen the situation[190]. A scientific study on noise pollution in a waste collection plant also identified several situations in which workers were exposed to noise level higher than 80 dB(A)[191].

In comparison to these hazardous sources of noise, the noise emitted by some equipment under the scope of the study is reported to have a relatively low impact on the environment. For instance, the International Snowmobile Manufacturers Association has released a Snowmobiling Fact Book[192] in which, based on several scientific studies, they report on the impact of snowmobiles on the environment and wildlife in particular. The noise emitted by snowmobiles is not reported to harm wildlife or to disturb animal behaviour. Snowmobiles are of particular interest as, although they are currently not covered by the OND, they may be integrated into the list of equipment covered by the Directive, based on the ODELIA recommendations.

Demand for quieter equipment

Demand for quieter equipment can have a big impact on the future of the OND. Stronger demand for quieter equipment could be a significant market driver that could put pressure on manufacturers to produce less noisy products even in the absence of specific legal requirements.

Overall, interviewees[193] agree that the noise level of outdoor equipment is not a purchasing driver for the average consumer (this was confirmed by the participants in the CATI survey). As underlined by the interviewees the main drivers during the purchasing decision are performance, safety and price, while noise levels are often overlooked. However, one professional organisation reported that when consumers are aware of noise hazardous effects on human health, they tend to take noise levels more into account during their purchase.

[190] S. Ahmed, I.A. Badruddin, K.Hussain, J.Kanesan, Z.Mallick, (2009). Noise characteristics of grass-trimming machine engines and their effect on operators. Noise & Health, April-June vol.11, 2009.

[191] D. Kaliakatsos, G.Mirabelli, T.Pizzuti (2015). Noise risk assessment in the workplace: the case of a waste selection plant. May 2015. Noise & Vibration worldwide.

[192] International Snowmobile Manufacturers Association, 2017. Available at: http://www.snowmobile.org/docs/isma-snowmobiling-fact-book.pdf.

[193] While this was confirmed by all consumers organisations interviewed, also the low participation rate of consumer organisations to the interview process of this study seems to indicate a low interest in this specific issue. About one hundred organisations were contacted, and while only a few agreed to be interviewed, about half reported not working on the topic at hand and could not provide useful insights.

Several interviewees mentioned that while there is much more attention to noise when it comes to indoor products (refrigerators, vacuum cleaners, etc.), less attention is paid to this characteristic of outdoor products. It also has to be considered that while the extra cost the consumer may support to acquire a less noisy product is borne only by the purchaser, the benefit is spread among people exposed. For the user might be cheaper and more intuitive to use some personal protection against noise (e.g. earplugs). A consumer organisation reported that the average consumer starts considering the noise produced only after the purchase when he/she is actually using the equipment, and it is too late to reconsider.

The demand for quieter equipment slightly varies according to the type of consumers. As shown in Table 6-13, according to the manufacturers who took part in the CATI survey, public authorities are the ones with the highest interest in low noise emission equipment in comparison with professional/leisure consumers.

Table 6-13: Demand from business, consumers and public authorities to provide quieter equipment, according to manufacturers (in percentage and per number of respondents)

Demand from the market	Not at all/ to a small extent	To a moderate extent	To a large extent/very large extent	Total
Business	53% (201)	30% (116)	17% (64)	100% (381)
Consumers	44% (75)	36% (61)	20% (34)	100% (170)
Public authorities	38% (49)	27% (35)	35% (46)	100% (130)

Source: CATI interviews

Need to raise awareness

There is still a need to raise awareness among consumers. As mentioned in section 6.1.4, consumers are generally unaware of the health impact of noise emission and do not have the knowledge to make an informed choice when purchasing outdoor equipment. As discussed, the OND did not accomplish its objective of raising awareness among consumers and encouraging a 'buy quiet' attitude.

Overall, **more effort should be put into increasing public awareness toward noise emission**. More information could be provided to the buyer in order to allow a greater understanding of the noise level. One interviewee mentioned that warning symbols (e.g. advising to wear earmuffs) could be useful to raise awareness about noise levels, while another suggested providing additional guidance through digital support (e.g. a QR code that, once scanned, would allow the buyer to have more information on noise levels, the meaning of dB, etc.).

6.3.3. Was the Directive relevant to the needs of the industry?

As discussed in section 6.1.6, prior to the OND the harmonisation of sound power levels of some types of outdoor equipment was entrusted to different legal instruments specific to different types of products. One of the objectives of the Directive, together with the protection of the well-being of citizens, was to ensure an efficient European internal market for outdoor equipment and preventing fragmentation[194].

[194] For further details see the "Intervention logic" in section 2.

As discussed in section 2.1, before the Directive was introduced, **calls had been made by several Member States to extend the pre-existent legislation on noise emission control to a wider range of products, to ensure that emerging national legislation on noise emissions would not lead to market barriers.** At the time, legislation had been set in France to control construction machine noise, in Germany to control noise of concrete pumps and mixers, and in the Netherlands to control the noise of motor chainsaws.

Most consulted stakeholders did indeed give credit to the OND for having prevented individual national approaches to noise limits in the Member States (see Chapter 2) [195,196]. Over the course of the years, Member States have also introduced voluntary schemes and incentives targeting the same issue (e.g. the *MIA-Vamil* scheme[197] in the Netherlands and the *Blauer Engel* label[198] in Germany) indicating an increased national awareness of this specific issue.

If most stakeholders recognised the positive effect of this EU-wide regulatory effort to prevent the market from fragmenting along national lines, sector organisations did not identify **any advantage with regards to foreign markets** (see section 6.1.10). As discussed above, outside Europe there is much less attention to noise emissions from both policymakers and consumers.

Regarding cheaper products from outside the EU entering the EU market, it was noted by the stakeholders on several occasions that market surveillance on this aspect is lacking as it regards non-compliant equipment within the EU market. The CATI respondents did not identify significant impact of European noise limits to their business outside the EU[199].

Thus, while the OND is relevant with regards to the needs of the industry to have a harmonised set of rules across the EU, the Directive and the stricter limits it imposes did not bring any advantages to EU companies in terms of their compliance with foreign legislation.

6.3.4. Is the Directive still relevant to the needs of the industry?

The previous section has shown that **most stakeholders assess the impact of the OND on trade within the single market positively**, although this judgement is based on a hypothetical scenario. This suggests that the Directive is still relevant for the needs of the industry, in the sense that it continues to prevent fragmentation of the market. In line with this perspective, almost none of the stakeholders would be in favour of repealing the Directive. Such a drastic intervention is seen as potentially

[195] For instance, 94,6% of the NBs and 70% of the MSAs who took part to our survey consider that the same results in relation to market fragmentation of outdoor equipment would not have been possible without the OND. This point was confirmed by a large share of interviewees who acknowledged that the Directive has prevented a further fragmentation of the market.

[196] 88,2% of the NBs and 72,7% of the MSAs who participated to our survey consider that the OND has ensured harmonisation of rules and procedures across the EU for the covered outdoor equipment. In addition, they unanimously acknowledged that the results in terms of fragmentation of the market would not have been possible without the OND.

[197] Van Heekeren & Firma Management Consultants bv, (2012) Evaluatie MIA en VAMIL 2005-2010. Available at:https://www.rijksoverheid.nl/binaries/rijksoverheid/documenten/rapporten/2013/09/17/mia-vamil-evaluatierapport-2005-2010/mia-vamil-evaluatierapport-2005-2010.pdf.

[198] Irmer, V. and Fischer-Sheikh Ali E. (1999). Reduction of Noise Emission of Construction Machines Due to the 'Blue Angel' Award. Available at: http://www.ingentaconnect.com/content/ince/nni/1999/00000007/00000002/art00001.

[199] 53% of the manufacturers responded "no impact", while 13% responded "somewhat more difficult "and "somewhat easier" each, 10% "much easier", 3% "much more difficult", and 9% "don't know" (n=304).

leading to the development of multiple national standards, and thus fragmentation of the Single Market.

An aspect that is considered not in line with the current needs of the industry is the third-party conformity assessment. When the OND came into force companies did not have the specific knowledge required to measure noise emissions. In order to make up for this lack of knowledge and establish the first line of control and uniform assessment, the Directive adopted a third-party conformity assessment performed by the Notified Bodies (NBs). They were entrusted with the task to perform precise and uniform measurements across the EU. Many sector stakeholders recognise that, while this system was in line with the needs of the industry at the time the Directive came into force, today, manufacturers have the skills to perform the measurements themselves and could rely on self-certification instead of the third-party conformity assessment. This seems to be confirmed by the CATI interviews conducted with manufacturers, according to which 68% (n=145) of respondents developed in-house quality assurance systems. The third-party conformity assessment is discussed more in-depth and from a different perspective in section 6.1.9.

6.3.5. Conclusions

Was the Directive relevant to the needs of the users and the environment? Is it relevant to the needs of the users and the environment?

When the OND came into force, it filled an existing gap concerning the protection of citizens exposed to noise emissions produced by outdoor equipment operated by other users, private or professional.

As discussed in section 6.1.2, it is estimated that for equipment under Article 12 the OND produced a reduction in noise emission between 2 and 6 dB. Considering that the sound power levels established by the OND are still above the threshold marked as safe for health and well-being, it is clear that at the time the Directive came into force, noise emissions were even more dangerous for EU citizens.

About seventeen years after the introduction of the OND, the growing urbanisation and the subsequent increase in construction of road and building infrastructures has led to the use of more outdoor equipment and therefore also its noise production[200]. Both stock numbers and work automation have increased. Especially consumer equipment has undergone a massive increase in numbers thanks to low-cost products available on the internet and in supermarkets. This increase in the number of equipment on the market and in use is felt to have counterbalanced the positive effect of the Directive in reducing noise emission levels renovating the need for pressure on the manufacturers to produce less noisy equipment. Such pressure could come from two sources: the market or the legislation. In the absence of market demand for quieter equipment, it is still up to the legislator to set limits to noise emissions for the outdoor equipment safeguarding well-being and health of citizens.

The low market demand for quieter equipment highlights the emergence of a new need to address. **There is a general lack of awareness from customers about noise emission and their impact on health and well-being that is not currently targeted by the Directive**.

Was the Directive relevant to the needs of the industry? Is it still relevant to the needs of the industry?

[200] Passchier-Vermeer, W and W F Passchier (2000). Noise exposure and public health. Environ Health Perspect. 2000 Mar; 108(Suppl 1): 123–131.

With regards to the needs of the industry, while the OND addressed the need for harmonisation and legal certainty across the EU, from an international trade perspective, the Directive and the stricter limits imposed did not bring advantages nor helped to comply with foreign legislation.

Almost none of the stakeholders would be in favour of repealing the Directive, seeing the potential risk of the development of multiple national standards.

An aspect that is considered not in line with the current needs of the industry is the third-party conformity assessment. When the OND came into force companies were missing the specific knowledge required to measure noise emissions, and the task of performing the conformity assessment was entrusted to the Notified Bodies (NBs). Today, many manufacturers have the skills to perform the measurements themselves and could rely on a self-certification instead of the third-party conformity assessment.

6.4. Coherence and complementarity of the Directive

This section evaluates the **internal and external coherence and complementarity of the Outdoor Noise Directive**. Each evaluation question is addressed separately, based on information collected through the literature review, semi-structured stakeholder interviews, CATI interviews, the Open Public Consultation, and the online survey.

The pieces of legislation in the main focus for this evaluation are:

- The Machinery Directive 2006/42/EC (MD)[201]
- The Non-Road Mobile Machinery Regulation (EU) 2016/1628 (NRMM Regulation)[202]
- The Environmental Noise Directive 2002/49/EC (END)[203]
- Directive 2003/10/EC on health and safety at work (Noise)[204]

6.4.1. Are there any overlaps/conflicts with other EU legislation?

As discussed in section 5.1, the Machinery Directive 2006/42/EC (MD) contains a set of requirements to reduce noise emissions in the design and manufacturing of products. It makes use of harmonised standards and addresses operator noise exposure/sound pressure level rather than sound power level. As confirmed by the interviewed stakeholders and the survey respondents, the divergence in measurement methods and test codes means that **where a piece of equipment falls under the scope of both Directives, manufacturers have to perform two different types of tests to achieve compliance with both, causing additional and avoidable burden** (see also section 6.2.4). The close relationship between the OND and MD was observed by the NOMEVAL study. While not discussing test codes, NOMEVAL noted that the solutions to reduce operator noise are not necessarily the same as the solutions to reduce environmental noise, as the operator can be protected by local shielding or changing the operator position.

Pelkmans et al.[205] conducted a study on the potential merger of the two Directives. Their main findings included the observation that the incorporation of noise measurement methods and test codes into European standards is somewhat problematic due to the fact that such standards are by nature voluntary. Adopting voluntary standards would potentially prompt some manufacturers to choose alternative conformity assessment methods, undermining the level playing field.

The Non-Road Mobile Machinery Regulation (EU) 2016/1628 (NRMM Regulation) covers small gardening and handheld equipment and construction machinery which are also in the scope of the OND, as well as snowmobiles which are among the suggested equipment to be added to the OND according to the ODELIA study. It sets emission limits for engines with different power ranges and lays down the procedures to be followed for type-approvals. **In certain cases, the OND requirement to reduce noise emissions and the NRMM Regulation requirement to produce less polluting equipment can be difficult for the manufacturers to meet at the same time.** An example given by sector organisations had to do with Diesel engines:

[201] https://osha.europa.eu/en/legislation/directives/directive-2006-42-ec-of-the-european-parliament-and-of-the-council.
[202] https://ec.europa.eu/growth/sectors/automotive/environment-protection/non-road-mobile-machinery_en
[203] http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32002L0049.
[204] http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:02003L0010-20081211.
[205] Pelkmans, J., Correia de Brito, A., Griner, A. and Luchetta, G. (2014) study on the merger of the directive on Noise from Outdoor Equipment, 2000/14/EC, with the Machinery Directive, 2006/42/EC (including an evaluation of Directive 2000/14/EC) - final report. Available at: https://ec.europa.eu/docsroom/documents/4985/attachments/1/translations/en/renditions/pdf.

In order to meet the emission requirements of the NRMM Regulation, formerly commonly used Indirect Injection (IDI) engines are increasingly replaced with Direct Injection (DI) engines, which are intrinsically noisier than the IDI engines. In addition, the new engines will generate more heat, requiring larger and therefore noisier fans (see also section 6.1.7). This issue was already observed in the NOMEVAL study in relation to the predecessor to the NRMM Regulation, the Exhaust Emission Directive for Non-Road Mobile Machinery 97/68/EC.

Regarding the review of the Directive and interplay with other Directives and Regulations, sector organisations noted that **the production cycle should be taken into consideration in the timing**. The average length of the production cycle is about five years, which is considered the minimum period of time for manufacturers to recover the investment in R&D. New engines have to be developed by 2020 to comply with the NRMM Regulation and should new obligations due to the OND Revision be established too close to that date; the stakeholders suggested this would cause losses for the manufacturers. As an example of the costs of the NRMM Regulation, it has been estimated that the conversion from Stage IV to Stage V[206] for mobile cranes would cost EUR 34.06 million and take approximately 3 years[207].

The stakeholders were somewhat aware of these overlaps. 44% of the respondents to the Open Public Consultation familiar with the Directive (n=150) agreed or strongly agreed that overlaps or conflicts with other EU legislation exist. 41% of the respondents did not present an opinion, while 15% disagreed with the statement.

The OND also interacts with the Environmental Noise Directive 2002/49/EC (END)[208] and the Directive 89/391/EEC OSH Framework Directive[209]. No overlaps or conflicts were identified with these two Directives, and their relationship with the OND is detailed in the next section 6.4.2.

6.4.2. Does the Directive complement other EU legislation/policies?

As discussed in section 5.1, the OND is part of **a wider network of legislation on environmental noise**, consisting of the Environmental Noise Directive 2002/49/EC (END)[210] and a range of legislation regulating environmental noise at the source. Considering that for the noise health impacts the source of noise is not in itself relevant, but the noise levels and length of exposure are the deciding factors[211], this comprehensive approach to noise level regulation is both valid and necessary. **The relationship between the END and OND also appears to be well-functioning**, and no overlaps of contradictions have been identified.

Directive 2003/10/EC[212] on the minimum health and safety requirements regarding the exposure of workers to the risks arising from physical agents (noise) sets the minimum requirements to protect workers from noise exposure, particularly its impacts on hearing. **The OND, in conjunction with the MD, provides for the**

[206] Stage V, introduced by the NRMM Regulation, is the latest and lowest stage of the European emission limits. It sets CO, HC, NOx, PM, and PN limits to diesel (CI) engines from 0 to 56 kW, and to all types of engines above 56 kW. The limits are detailed in Annex II of the Regulation.

[207] Günthner, W. A., Freis, J. & Amberger, M. (2014). Impact Study on Mobile Cranes: Emissions Inventory and Impact Assessment - Directive 97/68/EC: Projection into a Change from Stage IV to V and Transition from Stage III A to III B and III B to IV. Available at: http://www.fml.mw.tum.de/fml/images/Publikationen/150125_Impact-Study-on-mobile-cranes_Summary%20plus%20Link.pdf.

[208] http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32002L0049.

[209] http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:01989L0391-20081211.

[210] http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32002L0049.

[211] Freiermuth, A. (2017). Lärm macht krank und kostet Milliarden. Available at: https://www.migrosmagazin.ch/archiv/laerm-macht-krank-und-kostet-milliarden.

[212] http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:02003L0010-20081211.

requirement of information to be included about the noise emissions, to allow the evaluation of noise levels in the workplace, and selection of equipment with lower noise emission levels[213].

Market surveillance is an important tool in ensuring that all products in the internal market comply with the requirements and creating a level playing field in Europe. Article 5 of the OND obliges the Member States to take the appropriate steps to ensure that only compliant equipment reaches the market. However, as discussed in section 6.1.5, market surveillance related to noise limits is not sufficiently effective to protect the market from non-compliant equipment. **Lack of resources and training for market surveillance, as well as low prioritisation of noise issues by the Member States**, have been indicated as main causes for this insufficiency.

The Rapid Alert System for dangerous non-food products (RAPEX) facilitates the exchange of information between the national authorities of 31 participating countries and the European Commission on dangerous products found on the market. Manufacturers and distributors are obliged to inform the competent national authority if one of their products on sale is dangerous, and information about **the dangerous products is posted online in the RAPEX database[214]. As of June 2018, no OND related notifications had been entered into the RAPEX system**[215]**.** Whether that is an indication of insufficient market surveillance or the fact that no dangerous products have been identified remains unclear, particularly given the concerns with market surveillance outlined above.

The increasing number of non-compliant products on the Union market is recognised as a horizontal issue, and a Commission Proposal on Market Surveillance (COM(2017) 795 final)[216] was tabled in December 2017 to address this. It aims to consolidate the existing market surveillance framework, to encourage joint actions by Market Surveillance Authorities from the multiple Member States, improve the exchange of information and coordination, and to create a strengthened framework for controls on products entering the market[217]. In respect to market surveillance resources, it includes provisions for the Member States to ensure that MSAs are equipped with the necessary financial resources for properly performing their tasks (Article 21(1)) and for the Union to potentially finance the implementation of national market surveillance strategies (Article 36(2f)). We can, however, assume that where market surveillance resources are stretched, it remains possible that **other issues will continue to be prioritised above noise levels by the Member States if these issues are considered more important or potentially more harmful**.

The stakeholder opinion on the OND's complementarity with other EU legislation is largely positive. 62% of the respondents to the OPC (n=150) agreed that the Directive complements other EU legislation, while only 9% stated that it does not, and 29% expressed no opinion.

[213] Directorate-General for Employment, Social Affairs and Inclusion (2007). How to avoid or reduce the exposure of workers to noise at work. Non-binding guide to good practice for the application of Directive 2003/10/EC of the European Parliament and of the Council on the minimum safety and health requirements regarding the exposure of workers to the risks arising from physical agents (Noise). Available at: https://publications.europa.eu/en/publication-detail/-/publication/966d34a0-a10f-4d93-9672-d314438234d6/language-en.

[214] https://ec.europa.eu/consumers/consumers_safety/safety_products/rapex/alerts/?event=main.search.

[215] For outdoor equipment, an OND related notification would indicate a danger to the environment, not product safety.

[216] http://eur-lex.europa.eu/legal-content/EN/HIS/?uri=COM%3A2017%3A795%3AFIN.

[217] COM(2017) 795 final, p. 1.

6.4.3. Does the Directive leave gaps?

As already identified in the NOMEVAL study, a gap exists in the Directive related to the noise measurement procedures is the **lack of a procedure for determining the uncertainty**[218]. This was described by interviewees as a crucial point of the current measurement process. A method has been agreed among the Notified Bodies to bridge this gap, but the variability of guaranteed power levels remains, depending on the subject performing the measurement.

One of the objectives of the OND is to provide information to citizens on noise emissions, and thereby improve customer choice and encourage 'buy quiet'. However, consumers currently do not seem to possess sufficient interest or awareness of noise levels and the potential effect of exposure to noise to use them as a basis for purchasing decisions. In this sense, **the current OND proved not to be sufficient to motivate consumers to buy equipment producing lower noise levels**[219], as was confirmed by the interviewed stakeholders (see section 6.1.4). As a direct consequence, if there is no demand for reduced noise limits, manufacturers may be more likely to be tempted not to conform.

In order for EU citizens to be able to benefit from the additional noise information provided in line with the OND, a way needs to be found to provide consumers with enough knowledge that they actually understand and can use to inform their purchasing decisions. In addition, previous literature has found that plain information may not be enough to trigger changes in purchasing behaviour. Instead, an economic incentive is required.

6.4.4. By merging previous legislation, did the Directive improve the internal coherence of EU legislation?

The previous legislation is specified in section 2.1. The OND is seen by all consulted stakeholders[220] as having **improved the internal coherence of EU legislation**. While Pelkmans et al. (2014)[221] predicted that in the absence of sufficient EU level legislation, different Member State approaches to regulating equipment that produces outdoor noise might lead to internal market fragmentation, it appears that the Directive has avoided the divergence of different national standards and regulations. This view was confirmed by all stakeholders.

6.4.5. Are there any overlaps/conflicts with other non-EU legislation?

Of the OPC respondents who were familiar with the Directive (n=150), 48% had no opinion on whether the OND conflicts or overlaps with non-EU or national legislation, while 21% were of the opinion that it does, and 31% that it does not. A conflict with the measurement method of a French standard on collection bins and issues with the national transposition in Italy (see section 6.1.1) were specifically mentioned.

Among non-EU countries with noise regulation comparable to the OND, Canada regulates occupational noise exposure, aircraft noise, motor vehicle noise, and wind

[218] See section 6.1.9.

[219] Carletti, E. and Pedrielli, F. (2017). Noise classes for the outdoor machines subject to noise limits. 24th International Congress on Sound and Vibration. 23-27 July 2017. London.

[220] 76% of the Notified Bodies and 70% of the Market Surveillance Authorities that responded in the survey considered that the Directive has improved internal coherence. Most of the interviewees agreed on the same point.

[221] Pelkmans, J., Correia de Brito, A., Griner, A. and Luchetta, G. (2014) study on the merger of the Directive on Noise from Outdoor Equipment, 2000/14/EC, with the Machinery Directive, 2006/42/EC (including an evaluation of Directive 2000/14/EC) - final report. Available at: https://ec.europa.eu/docsroom/documents/4985/attachments/1/translations/en/renditions/pdf.

turbine noise on the federal level. Some provinces and municipalities have also set regulations or guidelines for outdoor environmental noise. These regulations, however, are generally not equipment specific. The outdoor noise limits are generally set in a range between 40 dB(A) and 65 dB(A), depending on the province, with different limits usually set for daytime and night-time, and in some cases for different types of area (rural, urban, etc.)[222,223,224,225,226].The maximum permitted exposure level for 8 hours at the workplace varies between 85 dB(A) and 90 dB(A), depending on the province[227]. In addition, the national standard CAN/CSA-Z107.58-02 (R2014) - Noise Emission Declarations for Machinery provides guidance on the declaration of noise from machinery, as well as requirements consistent with EU Directives pertaining to machinery[228]. It does not, however, set noise limits.

In Japan, noise legislation mainly addresses occupational noise exposure and traffic noise. The Noise Regulation Law approved in 1968 and updated in 2000 establishes environmental quality standards to be respected in residential areas, to be identified by local authorities[229]. The standards, defined in 1998, differentiate between three different types of areas:

- Areas where quietness is especially required, such as those where convalescent facilities and welfare institutions are concentrated;
- Areas used exclusively for residences; areas used mainly for residences;
- Areas used for commerce and industry as well as for a significant number of residences[230].

These environment quality standards do not apply to noise produced by aircraft, railway, or construction work. Similar to Canada, the environmental noise values are set between 40 dB or less and 60 dB or less, depending on the type of area and the time of day.[231] For construction work sites, the standard value set at the boundary line is 85 dB, with set maximum working duration (10h/day or 14 h/day depending on the type of area) and maximum consecutive working days (6 days)[232].

In Brazil, noise limits are set for particular types of equipment. *Resolução no 433, de 13 de Julho de 2011* sets decibel limits for some outdoor equipment, including

[222] Ministry of the Environment and Climate Change (2013). Environmental Noise Guideline - Stationary and Transportation Sources - Approval and Planning (NPC-300). Available at: https://www.ontario.ca/page/environmental-noise-guideline-stationary-and-transportation-sources-approval-and-planning#section-5.

[223] Nova Scotia Environment and Labour (1990) Guidelines for Environmental Noise Measurement and Assessment. Available at: http://www.noise-ordinances.com/wp-content/uploads/2015/09/EnvironmentalNoiseMeasurement.pdf.

[224] Bureau d'audiences publiques sur l'environnement (2006). Note d'instructions 98-01 sur le bruit (note révisée en date du 9 juin 2006). Available at: http://www.bape.gouv.qc.ca/sections/mandats/R185-cabano-N-B/documents/DB2.pdf.

[225] BC Oil & Gas Commission (2009). British Columbia Noise Control Best Practices Guideline, March 2009. Available at: https://www.bcogc.ca/node/8152/download.

[226] Alberta Energy Regulator (2007). Directive 038: Noise Control Available at: https://www.aer.ca/documents/directives/Directive038.pdf.

[227] CCOHS (2018). Noise - Occupational Exposure Limits in Canada. Available at: https://www.ccohs.ca/oshanswers/phys_agents/exposure_can.html.

[228] Canadian Centre for Occupational Health and Safety (n.d.) CAN/CSA-Z107.58-02 (R2014) - Noise Emission Declarations for Machinery. Available at: http://www.ccohs.ca/products/csa/27017332002&print=true

[229] https://www.env.go.jp/en/laws/air/noise/index.html.

[230] Between 50dB and 60dB in daytime and 40dB and 50dB in night time. https://www.env.go.jp/en/air/noise/noise.html.

[231] Ministry of the Environment, Environment Agency Notification No. 64, September 30, 1998. Environmental quality standards for noise Available at: http://www.env.go.jp/en/air/noise/noise.html.

[232] Noise Regulation Law No. 98 of 1968, Latest Amendment by Law No. 91 of 2000. Appendix II Tentative Translation. Available at: http://www.env.go.jp/en/laws/air/noise/ap.html.

mechanical shovels, excavator and loaders, compressors, and steam-jet machinery. The dB (A) limits for the relevant equipment are set between 96 and 109 (Annex B).

In the United States, the Noise Control Act (NCA) of 1972 is the main instrument for noise control but remains largely unfunded and therefore unable to execute any further product noise emission standards. The four existing standards have not been subjected to critical evaluation since their promulgation in the 1970s. A noise labelling programme was established in the late 1970s, but after cuts in funding for the EPA Office of Noise Control in the early 1980s, no labels have been required for stationary products (with the exception of portable air compressors). There are no other mandatory noise emission reporting requirements for stationary products in the USA. Voluntary labelling exists for some products, such as some hand-powered tools, IT and communications technology and consumer electronics, and home ventilator fans[233]. Some further noise controls have also been implemented in a city or state level, setting specific use times, or noise limits for particular types of equipment.

It has been suggested in literature that due to the comparatively low government interest and activity in noise regulation in the USA, the close alignment of European noise emission regulations with international standard bodies, and the fact that each country has one vote in ISO and IEC working groups, **making the EU a powerful influencer**, US manufacturers now have to match European standards to sell their products in global markets.[234] This seems to confirm the CATI findings that the European noise limits do not automatically put European manufacturers at a significant disadvantage in international markets.

The interviewed stakeholders observed that as the EU noise limits tend to be stricter than those in non-EU countries, the production of quieter products **does not provide any competitive advantage on the international market** (see section 6.1.10). Of the manufacturers responding to the CATI interviews, 69% report selling their products globally, compared to 16% selling only to the domestic market and 11% selling in the EU. For those stakeholders who sell their products both in and outside the EU, this means spending resources on a feature that will not improve their competitiveness in a potentially significant part of their market. Many of the consulted manufacturers who operate in the global market **did not consider the impacts to be particularly significant**, however, with 53% of the manufacturers responding to the CATI interview considering noise limits harmonisation having no impact on their business outside the EU[235].

Table 6-14: What is the impact of having the same noise limits across Europe on your business outside the EU (percentage and number of respondents)?

Much easier	Somewhat easier	No impact	Somewhat more difficult	Much more difficult	Don't know	Total
10% (30)	13% (38)	53% (160)	13% (39)	3% (10)	9% (27)	100% (304)

Source: CATI interviews

[233] National Academy of Engineering (2010). Technology for a Quieter America. Washington, DC: The National Academies Press. https://doi.org/10.17226/12928.
[234] Ibid.
[235] N=440

6.4.6. Does the Directive complement non-EU legislation/policies?

National policy instruments are used in conjunction with the OND, to encourage the use of quieter equipment. Schemes such as the *MIA-Vamil* tax[236] relief scheme in the Netherlands, the *Blauer Engel*[237,238] label in Germany, and the *Swan* Nordic Ecolabel[239] are used to make noise reduction more attractive and accessible to entrepreneurs and consumers.

There are some differences between the OND and the different European voluntary incentives, as these incentives generally aim to push the noise limits down even further. For example, the *MIA-Vamil* noise limits are on average 4% lower than the current European limits, while in order to earn the Nordic Ecolabel, lawnmowers must have a sound intensity 1-4 dB(A) below the legal requirement. The stakeholders had cautiously positive opinions on the efficiency of such national incentives in driving the market towards less noisy products,[240] noting that **these incentives can increase awareness of noise levels and the value of producing and buying quieter equipment** if both customers and manufacturers recognise their added value, bridging the gap identified in section 6.4.3.

In addition, if they provide sufficient financial incentive to the manufacturer, such national initiatives may encourage technological advancements in the field of noise control, which would eventually benefit the entire European market.

37% of the OPC respondents who were familiar with the Directive (n=150) thought that the OND complements non-EU legislation/policies, while 25% disagreed and 39% presented no opinion. Several respondents noted that **noise control initiatives in Brazil and Korea are aligned with EU Directives**, supporting the observation made in chapter 6.4.5 that EU regulations guide the international development of noise limits.

6.4.7. Conclusions

Internal coherence: Is the Directive coherent with other EU legislation?

In terms of internal coherence and complementarity, some conflicts were identified for manufacturers, stemming from **differing requirements with other legislative acts** applying to the same machinery. The differences in requirements with the Machinery Directive mean that some equipment must be tested twice, while the requirements of the Non-Road Mobile Machinery Regulation make it difficult for some equipment to comply with both. Both of these issues were already identified in the NOMEVAL study of 2007, although the NRMM Directive has since been converted to the NRMM Regulation. As also identified in the NOMEVAL study, **the lack of uncertainty measurement** in the Directive leaves a variability of guaranteed power levels, depending on the subject performing the measurement

[236] Van Heekeren & Firma Management Consultants bv, (2012) Evaluatie MIA en VAMIL 2005-2010. Available at:https://www.rijksoverheid.nl/binaries/rijksoverheid/documenten/rapporten/2013/09/17/mia-vamil-evaluatierapport-2005-2010/mia-vamil-evaluatierapport-2005-2010.pdf

[237] Federal Environment Agency (2013). Focus on 2013: The annual publication of the Umweltbundesamt. Available at: http://www.umweltbundesamt.de/sites/default/files/medien/publikation/long/4405.pdf.

[238] Irmer, V. and Fischer-Sheikh, A. E. (1999). Reduction of Noise Emission of Construction Machines Due to the 'Blue Angel' Award. Available at: http://www.ingentaconnect.com/content/ince/nni/1999/00000007/00000002/art00001.

[239] Nordic Ecolabelling (2013). Machines for parks and gardens, version 5.2. Background to eco labelling. Available at: http://www.svanemerket.no/PageFiles/6692/040e_5_2_Background_document.pdf

[240] 63% of manufacturers and 58 of rental/lease companies responding to the CATI interviews (N=440 and N=98 respectively), 60% of the surveyed NBs (N=33) and 90% of the surveyed MSAs (N=10) suggested effectiveness to small or moderate extent.

The OND is a coherent part of a wider, comprehensive network of environmental noise legislation in the EU, and additionally, it complements health and safety legislation by providing noise limits and information. **No conflicts were identified** within these frameworks.

As discussed in the previous sections, **insufficient market surveillance means** that non-compliant equipment may still enter the market and the level playing field is not guaranteed.

External coherence: Is the Directive coherent with non-EU legislation (national or international)?

In terms of external coherence and complementarity, **no major difficulties were identified** in regard to the relationship between the OND and extra-EU legislation. While in some instances the differences in noise limits inside and outside the EU can be seen as hindrances to trade, no particularly significant impacts were identified. In addition, some international limits are indeed influenced by the EU noise policy.

The OND is supported by **voluntary national incentives** increasing awareness of noise levels and the value of producing and buying quieter equipment. Considering that the Directive's own incentive for consumers to buy quieter equipment is considered insufficient, this is an important abetment.

6.5. EU added value of the Directive

This section presents the findings on the EU added value of the Directive. We first present the analysis with regards to the strategic objectives of the OND, before looking at the possible consequences if the Directive was withdrawn.

6.5.1. Would the same results in relation to the strategic objectives been possible without the EU intervention?

Section 6.1 identified the following key results of the OND:

- By harmonising the rules and procedures previously regulated by multiple pieces of legislation, the Directive has simplified the legal framework and improved stakeholders' activities;
- The Directive raised awareness among policy makers about the issue of noise emissions produced by outdoor equipment;
- The Directive has prevented the proliferation of different national regulations in the Member States ensuring that European manufacturers could trade their products without obstacles across Europe;
- By establishing limits to noise emissions by outdoor equipment the OND contributed to the safeguarding of citizens' well-being and of the environment.

The key question is whether these results could have been achieved without the EU intervention.

Simplification of the legal framework

Given that the OND resulted in the merger of a number of product / sector specific different EU Directives, it is difficult to imagine any other way to achieve the same result other than via an EU level simplification exercise. While this could have taken various forms (including complete deregulation at EU level), action had to be taken at EU level to simplify the pre-existing regulatory regime.

Increased awareness

Previous sections have highlighted how at the time the Directive came into force the issue of exposure to noise emissions from outdoor equipment was starting to appear on the policy agenda of EU Member States.

It was also highlighted how, in the years after the Directive was implemented, many Member States and local authorities became more and more proactive about limiting exposure to noise. Incentive strategies (as in the Netherlands or in Italy) have been put in place, or specific limitations to the utilisation of noisy equipment have been implemented in some countries. This indicates increasing attention towards noise emissions and the protection of citizens exposed to them which can at least partly be attributed to the awareness of the potential problem of noise emissions raised by the introduction of the OND.

Preventing the proliferation of different national regulations

As mentioned in the effectiveness section (section 6.1.8), before the OND was implemented, the first national legislative acts in this field were starting to appear. The stakeholders consulted for this study, when asked about a scenario without EU intervention, recognised the high risk of diverging national regulations being introduced in some Member States.

It is plausible to imagine that without intervention at EU level, Member States may have implemented a variety of different rules and requirements, creating potential obstacles to manufacturers selling their products abroad.

Safeguarding of citizens' well-being and of the environment

As mentioned in section 6.1.8, there is a general recognition that noise emission levels of outdoor equipment have dropped over the last 20 years, and most stakeholders recognise the positive role played by the OND (almost 75% of the respondents to the public consultation recognised a positive effect of the OND on Noise performance of equipment, n=113 64%, n=96, attributed the reduction of noise levels to the OND in particular in relation to noise produced by equipment covered by Article 12[241]). Some stakeholders suggested, however, that more recently the Directive has no longer had a positive effect, as test codes have not been updated and the push for lower noise limits has therefore stagnated.

The legal obligation established by Article 12 of the Directive forced manufacturers to invest resources in the research and development of special design, mechanisms and strategies to reduce noise emissions.

Over the years, technological developments not necessarily linked to noise emissions (e.g. the electric engines) have surely contributed to the reduction of noise emissions. However, and most of the stakeholder participating in the public consultation agree, (50%, n=75[242]) technological development and the market itself would not have been sufficient to reach the result we have today. First of all, as mentioned above, manufacturers have to balance several aspects when designing a product and, considering the low importance given to noise emissions by consumers, it is probable that other aspects would have been prioritised. Secondly, technological developments do not affect all types of equipment in the same way. For example, there are still combustion engine-based products that cannot yet be replaced by electric ones. Finally, technological advancements happened also thanks to the OND which, as recognised by several stakeholders, had a positive effect on research, development and innovation of equipment covered by the Directive.

6.5.2. Would the results achieved remain if the Directive was withdrawn?

Despite the highlighted shortcomings of the OND, none of the stakeholders consulted was in favour of repealing it.

It was mentioned that the legislative gap that would be created would expose manufacturers to legal uncertainty and potentially different legal requirements across the Member States. Over the years, Member States have adopted complementary rules to incentivise the production of quieter products and discourage the use of noisy equipment during certain periods or in certain areas (see sections 5.1 and 6.4.5). These initiatives prove that there is a renewed interest in the protection of wellbeing of citizens and in the absence of EU legislation it is possible that the Member States would step in.

Even if the free circulation of products was still ensured (e.g. through mutual recognition), different legal requirements would put manufacturers in countries with

[241] A smaller percentage (43%, n=65) recognised that 'noise emissions by outdoor equipment subject to noise marking only (Article 13) have been reduced thanks to Directive 2000/14/EC'

[242] 18% of respondents did not know and only 32% (n=48) is convinced that even without the Directive, noise emissions by outdoor equipment would have been reduced anyway.

stricter regulation at a disadvantage compared to their peers in the Member States applying looser rules. Also, phenomena such as forum shopping could arise.

In terms of protection of citizens' health and wellbeing, there is a perception that the OND, even with its limitations, managed to force manufacturers not to neglect the noise emitted by their products. **Without this legal obligation, many stakeholders agreed that noise emission control would be put aside in favour of other features (e.g. performance or energy efficiency) as it is the case in extra-EU markets**.

6.5.3. Conclusions

Would the same results in relation to the strategic objectives have been possible without the EU intervention?

Despite the limitations of the OND, the Directive achieved a few key results that would not have happened without it.

The Directive prevented the proliferation of different national regulations, and there is the perception that without it new national regulations might emerge.

Due to the Directive's requirements, noise levels decreased in the past twenty years despite the lack of market demand and the additional costs that had to be borne by companies.

Would the results achieved remain if the Directive was withdrawn?

Even though current limits may not be in line with state of the art, the Directive still obliges manufacturers to balance the research on higher performance equipment with the OND requirement regarding noise emissions. Without the Directive, given the absence of market pressure by consumers, it is likely that producers of outdoor equipment would neglect this aspect in favour of other features.

For all these reasons, none of the stakeholders consulted was in favour of repealing the OND.

7. CONCLUSIONS

The OND was introduced in a period when noise emissions and noise pollution by outdoor equipment were only starting to arrive on national agendas, thus putting the EU at the forefront at international level in terms of regulation of the noise emissions of outdoor equipment and raising awareness of this issue.

The OND has ensured that manufacturers invest resources in the research and development of special design, mechanisms and strategies to reduce noise emissions of outdoor equipment. Given the lack of market demand for quieter equipment and the scarcity of national incentives, the OND was and still is the primary force driving noise reduction for this type of equipment.

The OND simplified the existing legislative framework, thus bringing more clarity and improving the activity of all stakeholders who consider the Directive a reference point where to find all required information (type of equipment, limit and test code).

The key findings and conclusions for the main aspects of the Outdoor Noise Directive are as follows:

Did the Directive protect the health and well-being of citizens and the environment, by reducing permissible noise levels of such equipment?

Noise emission levels of outdoor equipment have dropped over the last 20 years. For equipment under Article 12 this reduction is estimated to be between 2 and 6 dB. Mostly due to the insufficiency of the label to steer purchasing behaviour, the inclusion of equipment under Article 13 was not sufficient to encourage manufacturers to develop less noisy products to the same degree.

The monetised benefits are estimated to be EUR 675 million for Article 12 equipment and EUR 788 million for Article 13 equipment, totalling EUR 1463 million in the period from 2000 to 2017.

Despite this achievement, most of the equipment covered by the OND, either by Article 12 or 13, are in the range of 90-130 dB sound power level. This means that bystanders at 25 metres of distance could be exposed to noise levels of 50-90 dB sound pressure level, with potential impacts on their well-being.

Although the OND has not reached its full potential of protecting the citizens from harmful effects of outdoor noise, citizens exposed to noise emissions from outdoor equipment are still better off than they would have been without the OND.

Did the Directive ensure an internal market for outdoor equipment, by preventing obstacles to the free movement of such equipment?

The OND is credited for having avoided the rise of different regulations at the national level that would have hindered the intra-EU circulation of covered equipment. While there is a general agreement that the OND consequently allowed for better trading across borders inside the EU, trade data to assess the concrete impact is scarce.

Although the OND may have avoided the proliferation of national legislation, gaps in market surveillance expose compliant manufacturers to unfair competition by their non-compliant peers, potentially undermining the level playing field.

In terms of extra-EU trade, there is no indication of a decrease in import from extra-EU countries as a consequence of the EU stricter noise limits. On the contrary, some EU producers have to adapt their products to better match the preferences of non-EU

customers by changing the design, increasing the power and even removing noise reduction elements from the products to reduce weight and increase power.

In addition to the lack of increased trade, it also needs to be noted that the environmental and health benefits discussed above are enjoyed by the citizens in general, while the industry bears most of the costs brought by the OND. Therefore, there is no direct compensation of the monetary burden for the businesses.

The noise label and market demand

Consumers lack awareness and basic technical knowledge of noise emissions, how they are defined, and their impact on health and wellbeing. This lack of knowledge has remained stable over the years and is not showing signs of change. Limited awareness impacts consumer interest in quieter equipment, thus affecting manufacturers' willingness to compete on this specific aspect and their preference for other product characteristics. This is particularly important for equipment under Article 13 which is not subject to specific noise limits.

The current label is considered insufficient to properly inform consumers and encourage them to buy quiet. For example, it does not allow to easily understand how a product performs on noise emissions in comparison with its peers. This also means that, the price increases for quieter equipment would not be an effective way to recover the costs of the Directive on the manufacturers.

Methods of measurement and test codes (basic noise emission standards and general supplements standards)

The standards providing for methods of measurement and test codes of Annex III have not been updated since the entry into force of the Directive itself and they are not in line with technological development nor with the latest versions of standards used by other EU legislative acts, especially the Machinery Directive. This causes:

- Potential loss of reliability in test results
- Additional costs for manufacturers having to comply with different but related obligations.

A revision of the methods of measurement and test codes is required, and alignment with the most recent versions of standards used by the Machinery Directive would allow saving resources currently spent on performing a double measurement.

There are two ways to change the methods of measurement and the test codes, and update the references to the relevant standards foreseen by the OND: a) through the procedure and the Committee established in accordance with Articles 18 and 19 of the Directive – never activated; or b) through a general revision of the Directive. The current system, however, appears to not be sufficient to guarantee a timely update of the references to the relevant newest standards.

In contrast the Machinery Directive, based on the "New Approach", has the advantage of referring to (voluntary) harmonised standards that as such are not incorporated in the body of the law and can be updated independently from it. A similar system could also be adopted by the OND although this should be aligned with the requirement to guarantee comparability, reliability and stability of the measurements, given that the OND establishes sound power limits that have to be respected for a product to be conform

The OND does not include a procedure to determine uncertainty, which in turn risks to cause inconsistency between guaranteed power levels depending on the subject performing the measurement. Including a procedure for determining measurement

uncertainty in the OND would improve the measurement process and provide additional clarity to manufacturers and Notified Bodies.

Market surveillance

Market surveillance is considered one of the cornerstones of the OND, but it is considered insufficient to ensure market safety, and gaps in the surveillance expose compliant manufacturers to unfair competition by their non-compliant peers. On top of affecting market safety and overall conformity of equipment on the market, the current state negatively impacts manufacturers' willingness to comply and makes additional costs introduced by the OND less tolerable.

Furthermore, gaps in the surveillance of non-conform products risk affecting the competitiveness of compliant companies negatively. These are indeed exposed to the unfair competition of non-compliant manufacturers who are able to save on investment in R&D and offer cheaper products.

There is a general agreement that Market Surveillance Authorities would require more resources and additional technical training to be able to deal with the more complex aspect of the noise measurements. Also, better integration and improved dialogue between the MSAs would allow a more efficient use of resources. The OND is not aligned to the New legislative framework, and as a consequence the Information and Communication System for Market Surveillance (ICSMS) is not used by MSA to report products not compliant with the Directive.

A new market surveillance proposal has been recently tabled by the Commission (the "Goods Package", December 2017). The proposal aims at increasing the resources available and enhancing coordination and collaboration among MSAs.

Third party conformity assessment

The costs of third-party certification are identified, together with R&D costs, as the most significant expenses brought on by the Directive. This cost could be significantly reduced by switching to some extent to a self-certification system also for equipment covered by Article 12, at least for some specific kind of equipment in the scope. However, there are diverging opinions about whether the change would compromise compliance and market safety.

The main argument supporting a switch is that when the OND came into force, companies were missing the specific knowledge required to measure noise emissions and the task of performing the conformity assessment was entrusted to Notified Bodies (NB). Today, many manufacturers have the skills to perform the measurements themselves and could rely on self-certification instead of third-party conformity assessment.

While some cost savings could undoubtedly be made by switching to self-assessment, the current shortcomings of market surveillance, as well as the lack of market pressure for quieter equipment, leave significant room to operate for producers who are not interested in compliance.

If third-party certification is kept, it should also be considered that Notified Bodies able to conduct the measurements established by the OND are not present in all Member States. This represents a challenge for manufacturers who are required to seek the needed expertise in other Member States.

The NOISE Database

The NOISE Database collecting the Declarations of Conformity is considered not to fulfil its full potential. Indeed, the study finds that in its current form it is an outdated tool with clear shortcomings, including:

- incorrect equipment types registered;
- technical parameters often missing or clearly out of range, especially for Article 13 equipment;
- lack of control on the users registering in the database.

The data it contains is considered to a certain extent unreliable (the ODELIA study had to conduct a thorough cleaning exercise to use the data), and the system is not really used by any of the consulted stakeholders.

Manufacturers complain about the low usability and flexibility of the database, while most stakeholders would appreciate extending the functionalities of the database to make it into an instrument that is useful for everyone: manufacturers, market surveillance authorities, EU legislators and consumers.

Given the current shortcomings of the database and its limited current access and functionalities, most of the stakeholders highlighted how a refurbishment of the tool would be required. In the absence of such action, manufacturers would prefer the obligation ex. Article 16 to be lifted.

Evaluation Final Report - Annexes

ANNEX I: STAKEHOLDER CONSULTATION

The data collection process for this study was organised around 6 tasks:

- Review of the literature;
- Interviews with EU and national stakeholders;
- CATI interviews;
- Case study;
- Open public consultation; and
- Survey of Market Surveillance Authorities (MSAs) and Notified Bodies (NBs).

This section presents an overview of the situation of each task.

1.1 Literature review

The task was carried out in three steps.

1. The study used several search tools (e.g. Google Scholar, EBSCO, ScienceDirect) to identify a long list of relevant articles.
2. Out of these articles, about 60 were selected on the basis of relevance, chronological and reliability criteria.
3. Shortlisted literature was analysed, and the outcomes were fed into the report.

Academic and policy literature on technical and economic aspects of outdoor equipment noise, as well as on the environmental, social and health impacts of noise were sought in international sources (e.g. WHO, green and white papers, EC evaluation studies, position papers, EU project results) but in key national documents in the local language (e.g. National research projects, National Health Council reports). The literature review also identified experiences from other key trading partners (such as the USA, China, South Korea, Japan, Brazil etc.).

1.2 Interviews with EU and national stakeholders

One of the key sources of information for the study is the consultation conducted with different types of stakeholders that are directly affected by the Directive at EU and national levels.

Interviews at national level were to be conducted in 16 MS (see Table 1 below) selected to ensure interviews distribution across Europe and MS of different sizes. However, the responsiveness of national organisation has been low, more details are provided further below.

Table 1: List of MS interviews

MS	Geographical location	Size of the MS[1]
Austria	West	Medium
Bulgaria	East	Medium
Croatia	East	Small
Czech Republic	East	Medium
Denmark	North	Small
Germany[2]	West	Large

[1] Based on the key used for Qualified Majority Voting. For example in Magnette, P. and K. Nicolaidis (2003). Large and Small Member States in the European Union: Reinventing the Balance. Research and European Issues No. 25, May 2003, Updated version June 5, 2003. pp. 10. Available at: https://infoeuropa.eurocid.pt/files/database/000005001-000010000/000007080.pdf.

[2] Focusing on the Bavarian Bundeslang.

MS	Geographical location	Size of the MS[1]
Finland	North	Small
France	West	Large
Italy	South	Large
Lithuania	North	Small
Netherlands	West	Medium
Poland	East	Large
Portugal	South	Medium
Spain	South	Large
Sweden	North	Medium
United Kingdom[3]	North	Large

Interviews were conducted with the following stakeholders:

- EU level sector organisations
- National Consumer/Environmental associations in selected MSs[4]
- Environmental offices in selected MSs[5]
- The European Committee for Standardisation (CEN)
- New approach consultants and sector experts.

Overall, the study team completed 32 interviews.

Table 2 below lists the interviews conducted for each stakeholder category.

Table 2: Conducted interviews

Stakeholder category	Organisation name
EU sector organisations	EuropGen
	EUnited Cleaning
	EUnited Municipal Equipment
	FEM (European Materials Handling Federation)
	CEMA (European Agricultural Machinery)
	Orgalime
	EPTA (European Power Tool Association)
	EGMF (The European Garden Machinery Industry Federation)
	CECE (Committee for European Construction Equipment)
	ISMA (International Snowmobile Manufacturers Association)
National consumers organisations	Suomen Kuluttajaliitto (FI)
	Association antibruit de voisinage (FR)
	Verbraucherzentrale Hamburg (DE)
National interest groups	Institute for the Advancement of Safety (HR)
Environmental organisation	The Finnish Association for Nature Conservation (FI)
Environment local offices	Mairie de Paris, Responsable de la Division Impacts Santé – Environnement (FR)
	Plovdiv Municipality (BG)

[3] Limited to an UK-based expert in the OND surveillance whose contact will be provided by the EC.

[4] The Study team reached out to about 100 organisations and environmental offices in 16 MS (Austria, Bulgaria, Croatia, Czech Republic, Denmark, Germany, Finland, France, Italy, Lithuania, Netherlands, Poland, Portugal, Spain, Sweden, United Kingdom) selected to provide a good geographic distribution of the interviews and on the basis of relevant market size. However, only consumer/environmental associations in Croatia, Germany, Finland, France showed interest in participating in the study. Also only environmental offices in Bulgaria, Germany, France were available for an interview.

[5] See previous footnote.

Stakeholder category	Organisation name
	City of Munich, Department for Health and Environment (DE)
	City of Berlin, Senate Department for the Environment, Transport and Climate Protection (DE)
	Federal Environmental Agency (DE)
Public authorities	Ministry of Health, State Inspection for Ecology and Legal Support, Unit for General Use Objects and Noise Protection (HR)
Sector experts	Four experts interviewed
Standardisation	European Committee for Standardization - CEN
Market Surveillance Authorities	One representative interviewed (IT)
Notified Bodies	Three representatives interviewed (DE, IT)
Manufacturing companies	EMAK (IT)
	Stiga (IT)
Total	**32**

1.3 CATI interviews

The CATI interview process started in September 2017 and was closed in April 2018.

The research team gathered input from 441 manufacturers and 98 rental/leasing companies. About 370 manufacturing companies were SMEs and more than two-thirds micro or small enterprises. Table 3 presents the final status of the interviews conducted by country and type of company.

Table 3: Breakdowns of the interviews conducted compared to the initial target (in number of interviewees per countries)

	Interviews conducted		
Country	Manufacturing	Rental	Total
Austria	17	5	22
Belgium	18	8	25
France	55	13	48
Germany	51	13	50
Ireland	7	8	12
Italy	105	15	104
Netherlands	37	8	41
Poland	43	8	50
Spain	70	9	49
Sweden	19	9	23
Not specified	18[6]		
Total	441	98	539

1.4 Case study

One case study was carried out in the Netherlands about two relief schemes that have been active since 2001. The *Milieu-investeringsaftrek* (MIA, Environmental Investment Deduction) and the *Willekeurige afschrijving milieu-investeringen* (Vamil, Voluntary Depreciation on Environmental Investment) are fiscal incentives that offer entrepreneurs

[6] 18 manufacturers who participated to the survey did not specify their country of origin.

the opportunity to make investments in environmentally friendly techniques in a fiscally attractive way.

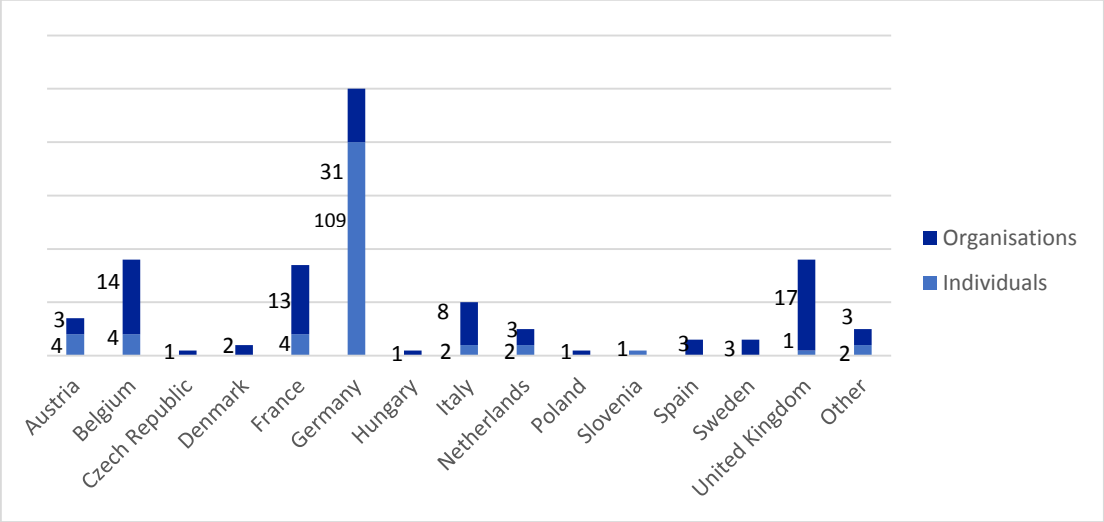
For this case study, 14 documents were reviewed, and two interviews were conducted, one with the Ministry for Infrastructure and the Environment of the Netherlands and the other with the Netherlands Enterprise Agency.

1.5 Open Public Consultation

The Open Public Consultation collected contributions from all interested parties, stakeholders, organisations and citizens in general who are affected by the Directive, its current functioning or any potential future modifications.

The consultation was launched as an electronic survey on 23 January 2018 and ran for 12 weeks until 18 April 2018. The final results are included in the present document. 232 stakeholders (129 individuals, 103 organisations) took part in the public consultation (see Figure below)

Figure 1: Country of origin of the participants to the open public consultation (N=232)[7]



Different types of organisations (n=103) took part in the public consultations including:

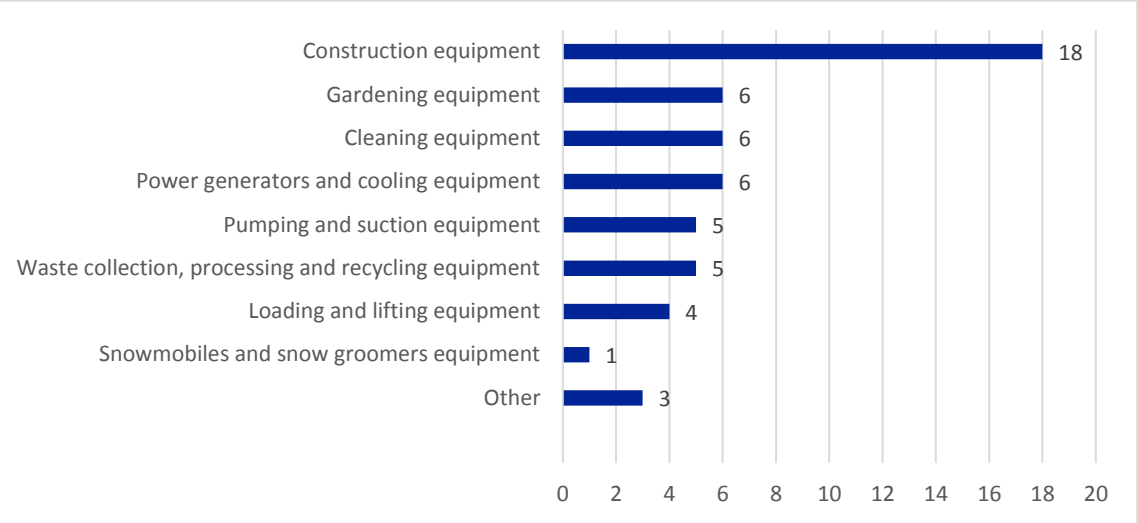
- Private enterprises (n=38)
- Trade, business or professional associations (n=24)
- Regional and local public authorities (n=14)
- International or national public authority (n=9)
- Non-governmental organisations, platforms or networks (n=5)
- Professional consultancies, law firms, self-employed consultants (n=3)
- Research and academia (n=3)
- Other (n=7)[8]

[7] EU countries not represented are: Bulgaria, Croatia, Cyprus, Estonia, Finland, Greece, Latvia, Lithuania, Luxembourg, Malta, Portugal, Romania, Slovakia. The participants coming from non-EU countries come from Switzerland and the USA.

[8] Out of the 7 respondents who indicated other: 1 is a public enterprise, 2 are manufacturers of machines, 1 is a notified body, 1 is an organism in charge of standards, 1 is a local authority and 1 is an NGO.

The majority of the **private enterprises** represented are large enterprises (72%, n=23). About 84% (n=32) of them are manufacturers of outdoor equipment covered by the Directive and in particular of construction equipment (47%, n=18).

Figure 2: Type of equipment produced or distributed by the private enterprises which took part in the Open Public Consultation (n=38)[9]



As for respondents included in the **trade, business or professional associations**, 88% (n=21) of them are business organisations. All of the trade, business or professional associations represent manufacturers of outdoor equipment covered by the Directive or companies using such equipment.

129 participants in the consultation responded as **individuals**[10]. Out of these, only 5% (n=12) reported to be **users** of outdoor equipment while the majority (45% n=105) reported to be exposed to noise emissions by outdoor equipment. All the users of outdoor equipment (n=12) are using or buying mostly gardening equipment.

Out of the 232 participants, 39% (n=91) have detailed knowledge of the Directive, its objectives, the limits and the requirements/obligations that it imposes. 25% is aware of the existence of the Directive but not of all its specific contents. About 35% (n=82), mostly either people exposed to noise from outdoor equipment or users of such equipment, indicated that they did not know the Directive. They were not asked questions related to the functioning of the OND but a set of questions investigating their experience with sources of outdoor noise and usage habits.

[9] Some of the respondents are active in several sectors.
[10] Individuals here relate to the stakeholder category (as opposed to the respondents who participated on behalf of an organisation).

Annex 1.1 Interview guide: EU industry organisations

Market information

1. *Could you please describe the market structure of your sector? Please distinguish between national and European level*
    a. *Typical dimension of manufactures (employment, turnover)*
    b. *Number of manufacturing companies in your country/Europe (possibly by dimension)*
    c. *Level of cross-border activity (are companies more focused on national market or they sell everywhere in Europe? What about international markets?)*
    d. *Typical type of customers (private and professional)*
    e. *Competition from Third Countries*
2. *How familiar are you with the Directive 2000/14 on Noise emission of outdoor equipment?*

Noise emissions

3. *Is there a market demand to provide quieter equipment than we have today? How does this differ between different types of equipment and type of users (private and professional users)?*
4. *Would incentives for less noisy product stimulate the market? (e.g. extension of operating hours for less noisy equipment) Would you have any concrete example of this?*
5. *Are manufacturers investing in research and development (R&D) to reduce noise levels of outdoor equipment? What percentage of R&D is spent on exterior noise reduction for outdoor machinery?*
6. *Does the production of less noisy products give an edge on the international market? (please specify the markets)*
7. *Which market sectors (consumer, public authorities, rental companies, industry, others) or areas set the most or strongest requirements on outdoor equipment noise emission? Does the Directive set a benchmark in this respect?*
8. *Are there sectors or type of equipment for which compliance with Noise limits is more challenging, and non-compliance is more frequent?*
9. *What would be the consequences of a further 2-3 dB noise reduction of noise emission of outdoor equipment currently subject to noise limits? Would it be technically feasible? Please ask a detailed feedback for each equipment covered when mentioned*
    a. *On R&D*
    b. *On costs of equipment (for each equipment)*
    c. *On machine performance (for each equipment)*
    d. *On the market structure*
    e. *On trade / imports intra-EU*
    f. *On trade / imports extra-EU*
    g. *On the environment / consumer well-being (for each equipment)*
    h. *On consumer prices (for each equipment)*
10. *What would be the consequences of setting noise limits (on average 2-3 dB noise reduction) for noise emission of outdoor equipment currently not subject to limits? Would it be technically feasible? Please ask a detailed feedback for each equipment covered when mentioned*

a. *On R&D*
b. *On costs of equipment (for each equipment)*
c. *On machine performance (for each equipment)*
d. *On the market structure*
e. *On trade / imports intra-EU*
f. *On trade / imports extra-EU*
g. *On the environment / consumer well-being (for each equipment)*
h. *On consumer prices (for each equipment)*

11. *What would happen if EU set noise limits and related obligations were repealed today, please notice that this could also mean the establishment of not harmonised national noise limits?*

Legislation and incentives

12. *Are you aware of other legislation or incentives that have proven effective in protecting the health and well-being of citizens from noise of outdoor equipment?*
13. *Would you be able to suggest initiatives or incentives that could be effective in protecting the health and well-being of citizens from noise of outdoor equipment?*

Noise marking

14. *To what extent are costumers aware of outdoor equipment noise? (please distinguish between consumers and professional users)*
15. *Do you believe that the noise marking on machines is clear for the consumer or purchaser?*
16. *Is it effective in putting market pressure on manufacturers to produce lower noise equipment?*
17. *Which label design would you consider to be the best in your opinion (taking into account the various proposals: as it is currently, a colour label, a dynamic label, or other)?*
18. *What would be the impact of implementing such a labelling system? (e.g. on industry, on consumers, etc.)*
19. *What would be the economic and environmental impact of extending the CE Marking obligation to new types of equipment?*

Noise database

20. *Do you have access to the EC outdoor machinery noise database? If so, what is your opinion about it?*
21. *Are there specific aspects or issues that the evaluation and impact assessment should consider?*
22. *Would you be in favour of having Notified Bodies fill in the NOISE database instead of companies?*
23. *Would you consider useful having access to a public database collecting noise emission levels for outdoor equipment?*

Conformity assessment procedures

24. *What is your opinion of the conformity assessment procedures? Please also consider the following indicators and suggest additional ones if needed:*
    a. *Technical documentation required Response time?*
    b. *Frequency of random checks*
    c. *Test conducted by NB Check of NB on QA systems*
25. *Are the available tools for compliance effective in supporting the conformity procedure and reducing barriers to compliance? (e.g. e-form "NOISE", Recommendation for Use sheet)*
26. *Do you think that the third party conformity assessment procedures is useful to ensure compliance and reinforce consumer trust?*
27. *Are legal remedies against non-compliance procedures available and effective for companies? Huge differences across Europe*
28. *What would be the impact of replacing the conformity assessment procedure with a self-certification?*
    a) *On Administrative burden for carrying out the assessment of noise levels*
    b) *On Price to consumer*
    c) *On Share of non-compliant equipment reaching the market*
    d) *On Customer take up of quieter equipment*
    e) *On Noise pollution caused by outdoor equipment*

Market surveillance

29. *Do you believe that current conformity procedures and market surveillance are sufficient? In your view, what share of the market is not in compliance? Please describe which kind of equipment / in which countries / from which countries?*
30. *Do national authorities and EC take appropriate steps against non-compliant equipment?*
31. *Do you think that in the last 10 years there has been an improvement in the market surveillance and its effectiveness?*
32. *Do you think that sufficient resources are allocated to market surveillance in your country?*
33. *Do you think that there is enough collaboration between Market Surveillance Authorities and Notified Bodies?*
34. *What alternative options/solutions are needed to overcome the issue of non-compliant products reaching the market?*

Forward looking

35. *Please rank the following option from 1 to 4 (1 being your favourite option and 4 the less favourite option):*
    a. *Keeping the current noise limits and conformity assessment procedures (Status quo)*
    b. *Eliminating all noise limits and obligations*

c. *Setting noise limits for equipment currently subject to marking obligation and extending marking obligation to new outdoor equipment and keeping current conformity assessment procedures*
d. *Setting noise limits for equipment currently subject to marking obligation and extending marking obligation to new outdoor equipment and replacing conformity assessment procedures with a self-declaration*

36. *Do you consider any current market trends relevant for changes to the Directive, for example internet sales and product data, move toward electrically powered equipment, increase awareness of noise emission?*

Effectiveness

37. *Do you believe the OND has benefited the market for outdoor equipment? Possible prompts:*
    a. *Ensured harmonisation of rules and procedures across the EU*
    b. *Allowed companies to sell their products everywhere across the EU*
    c. *Ensured that only compliant equipment reaches the market*
    d. *Drove the reduction of noise levels of outdoor equipment (the market would not have moved anyway toward less noisy products)*
    e. *Noise levels of outdoor equipment were reduced by sufficiently to have an impact on the health and well-being of citizens*
    f. *Noise levels of outdoor equipment under Article 13 (not subject to permissible sound power levels) were also reduced thanks to the Directive*
38. *Are there any barriers for all stakeholders involved, in terms of practical and legal issues, in complying with the Directive? Categories of stakeholders:*
    a. *Manufacturing companies*
    b. *Distributing/importing companies*
    c. *Notified bodies*
    d. *Market surveillance organisations*
39. *Are there any other difficulties or barriers inhibiting an optimal functioning of the Directive and hindering the Directive from reaching its strategic objective of protecting the health and well-being of citizens and the environment?*
40. *What alternative options/solutions are needed to overcome these barriers/difficulties?*

Relevance

41. *Are there still different noise limits across Europe for outdoor equipment not covered by the Directive hindering the free circulation of such products? (please provide examples)*
42. *Are noise emissions still so high to risk to be a danger for health and well-being of citizens?*
43. *Are there other challenges in relation to noise levels of outdoor equipment that are not currently addressed by the Directive? (please provide examples)*

Efficiency

44. *Did the Directive reduce or introduce unnecessary administrative burdens and/or costs for the activities of companies in your sector? Please describe and quantify*
45. *Were burdens placed on the industry levelled off or exceeded by the benefits of increased trading across Europe?*
46. *What is the impact of the Directive on SMEs in comparison to larger enterprises? What would be its impact on SMEs in the case of revision with stricter noise limits?*
47. *Could you identify the cost elements of the Directive and highlight the ones that are more resources-demanding (manpower, time, etc.)? (e.g. R&D, assessment procedures)*
48. *Do you think that the strategic objective of ensuring an internal market for outdoor equipment could be achieved at a lower cost? How?*
49. *Do you think that the strategic objective of protecting the health and well-being of citizens and the environment could be achieved at a lower cost? How?*

Coherence

50. *Are there any overlaps/conflicts with other international, European, national legislation?*
51. *In particular, do you see any potential conflict with the following EU legislation:*
    a. *Environmental Noise Directive 2002/49/EC*
    b. *Machinery Directive 2006/42/EC*
    c. *Non-Road Mobile Machinery Regulation (EU) 2016/1628*
52. *Does the Directive complement other international, European, national legislation?*
53. *Does the Directive leave legislative gaps?*
54. *By merging previous legislation (7 product Directives and 2 procedure Directives), did the Directive improve the internal coherence of EU legislation?*

EU added value

55. *Do you think that without the Directive there would be different noise limits and standards across Europe?*
56. *Would the same results in relation to the protection of health and well-being of citizens and environment from noise caused by outdoor equipment have been achieved without EU intervention?*

Closing questions

57. *Is there anything that you would like to add?*
58. *If you provided a paper to the Noise Expert group in 2015/2016, is there anything more to add to this?*

59. *Is there any national sector organisation we should talk to? Why?*
60. *Would you be available to put us in contact with several manufacturing companies who are members of your organisation for a short interview?*

Annex 1.2 Interview guide: National consumer organisations

Market information

1. *Is there a market demand to provide quieter outdoor equipment than we have today? How does this differ between different types of equipment?*
2. *To what extent are consumers aware of outdoor equipment noise?*
3. *Do you believe noise levels are taken into account when purchasing products? Or are they only experienced afterwards, affecting future brand preferences?*
4. *Is there a need to increase awareness? How could this be done?*
5. *Do you include noise performance data in your product reviews?*
6. *Do you use own measurements or other data sources, such as internet product data, to compare noise emission of products?*
7. *Which consumer market sectors are most important in relation to noise emission?*
    - *gardening tools (lawnmowers, trimmers, brush cutters, chainsaws, shredders, leaf blowers, hedge trimmers, motor hoes etc.)*
    - *cleaning equipment (water jets,…)*
    - *generators (portable)*
    - *water pumps*
    - *compressors*
    - *stone saws*
8. *Of the above equipment, only lawnmowers, trimmers, motor hoes, generators and compressors have noise limits. Do you think it is appropriate that the others should also have limits?*
9. *Are you aware of market trends in outdoor equipment noise in other countries (EU and non-EU)?*
10. *How familiar are you with the Directive 2000/14/EC on Noise emission by outdoor equipment?*

Noise emissions

11. *Do you believe that over the last ten years noise emissions of outdoor equipment were reduced?*
12. *Do you believe that current noise emissions of outdoor equipment pose a risk to the health and well-being of citizens and environment? Why?*

13. *What would be the consequences of a further 2-3 dB noise reduction of noise emission of outdoor equipment currently subject to noise limits?*
    a. *On production costs of equipment*
    b. *On machine performance*
    c. *On the market structure*
    d. *On trade / imports intra-EU*
    e. *On trade / imports extra-EU*
    f. *On the environment / consumer well-being*
    g. *On consumer prices*
14. *What would be the consequences of setting noise limits (on average 2-3 dB noise reduction) for noise emission of outdoor equipment currently not subject to limits?*
    a. *On production costs of equipment*
    b. *On machine performance*
    c. *On the market structure*
    d. *On trade / imports intra-EU*
    e. *On trade / imports extra-EU*
    f. *On the environment / consumer well-being*
    g. *On consumer prices*
15. *What would happen if EU set noise limits and related obligations were repealed today, please notice that this could also mean the establishment of not harmonised national noise limits?*

Legislation and incentives

16. *Are you aware of other legislation or incentives that have proven effective in protecting the health and well-being of citizens from noise of outdoor equipment?*
17. *Would you be able to suggest initiatives or incentives that could be effective in protecting the health and well-being of citizens from noise of outdoor equipment?*

Noise marking

18. *Do you believe the noise marking on machines is clear for the consumer or purchaser?*
19. *Is it effective in putting market pressure on manufacturers to produce lower noise equipment?*
20. *Which label design would you consider to be the best in your opinion (taking into account the various proposals: as is, colour label, dynamic label, or other)?*
21. *What would be the impact of implementing such a labelling system? (e.g. on industry, on consumers, etc.)*
22. *What would be the economic and environmental impact of extending the CE Marking obligation to new types of equipment?*

Conformity assessment procedure

23. *By law, there are three types of conformity assessment procedures performed by a third party (the Notified Body), what is your opinion on these procedures? (please consider the following sub-questions)*
    a. *Do they ensure enough protection to consumers and citizens?*
    b. *Do they ensure that only compliant products reach the market?*
    c. *How do you evaluate the effectiveness of the three procedures set for equipment under Article 12?*
24. *What would be the impact of replacing these third party conformity assessment procedures with a self-certification? (e.g. on compliance, product safety, etc.)*

Market surveillance

25. *Do you believe that current conformity procedures and market surveillance are sufficient? In your view, what share of the market is not in compliance? Please describe which kind of equipment / in which countries / from which countries?*
26. *Do national authorities, and EC take appropriate steps against non-compliant equipment?*
27. *Have you ever notified the Market Surveillance Authority of complaints about excessive noise of outdoor equipment? If so, please provide more details (e.g. number of complaints, type of equipment, consequences, etc.)*
28. *Do you have data about complaints concerning noise level of products?*
29. *Do you think that in the last 10 years there has been an improvement in the market surveillance and its effectiveness?*
30. *Do you think that sufficient resources are allocated to market surveillance in your country?*
31. *Do you think that there is enough collaboration between Market Surveillance Authorities and Notified Bodies?*
32. *What alternative options/solutions are needed to overcome the issue of non-compliant products reaching the market?*

Forward looking questions

33. *Please rank the following options from 1 to 4 (1 being your favourite option and 4 the less favourite option):*
    a. *Keeping the current noise limits and conformity assessment procedures (Status quo)*
    b. *Eliminating all noise limits and obligations*
    c. *Setting noise limits for equipment currently subject to marking obligation and extending marking obligation to new outdoor equipment and keeping current conformity assessment procedures*
    d. *Setting noise limits for equipment currently subject to marking obligation and extending marking obligation to new outdoor equipment and replacing conformity assessment procedures with a self-declaration*

Effectiveness

34. *Do you believe the OND has benefited the market for outdoor equipment? Possible prompts:*
    a. *Ensured harmonisation of rules and procedures across the EU*
    b. *Ensured that only compliant equipment reaches the market*
    c. *Drove the reduction of noise levels of outdoor equipment (the market would not have moved anyway toward less noisy products)*
    d. *Noise levels of outdoor equipment were reduced by the extent to have an impact on the health and well-being of citizens*
    e. *Noise levels of outdoor equipment under Article 13 (not subject to permissible sound power levels) were also reduced thanks to the Directive*
35. *And do you believe OND could be improved, and if so how?*
36. *Are there any other difficulties or barriers inhibiting an optimal functioning of the Directive and hindering the Directive from reaching its strategic objective of protecting the health and well-being of citizens and the environment?*
37. *What alternative options/solutions are needed to overcome these barriers/difficulties?*

Relevance

38. *Do you think current noise levels of outdoor equipment pose a risk to the health and well-being of citizens and environment? (please provide examples)*
39. *How does this differ for different types of equipment covered by the Directive?*
40. *What about equipment that is only subject to marking (Article 13) (please provide examples)*
41. *And what about equipment that is not covered by the Directive?*
42. *Are there other challenges in relation to noise levels of outdoor equipment that are not currently addressed by the Directive? (please provide examples)*

Efficiency

43. *Do you think that the strategic objective of protecting the health and well-being of citizens and the environment from noise caused by outdoor equipment could be achieved at a lower cost (e.g. more effective/ less expensive measures)? How?*

Coherence

44. *To your knowledge, Are there any overlaps/conflicts with other international, European, national legislation? (in particular, the Machinery Directive)*
45. *To your knowledge, does the Directive complement other international, European, national legislation? (in particular, the Machinery Directive)*
46. *Does the Directive leave gaps?*

EU Added value

47. *What would have happened if the Directive never existed?*
48. *Would the same results in relation to the protection of health and well-being of citizens and environment have been possible without EU intervention?*

Closing questions

49. *Is there anything that you would like to add?*
50. *If you provided a paper to the Noise Expert group in 2015/2016, is there anything more to add to this?*

Annex 1.3 Public consultation questionnaire

Open Public Consultation on an evaluation and possible revision of the Outdoor Noise Directive 2000/14/EC

Fields marked with * are mandatory.

Introduction

The European Commission is evaluating the performance of the current legislation on the noise emission in the environment by equipment for use outdoors: the Outdoor Noise Directive (OND) 2000/14/EC (*), covering some 57 types of outdoor machinery, such as those used on construction sites or in parks and gardens.
At the same time, based on the information received so far, it is also considering the possibility to develop a legislative proposal to revise the Directive, taking into consideration the EU legislative framework on health and safety of products in the internal market, and the technical progress and the state of the art in this industrial sector. More information on the possible revision can be found in the Inception Impact Assessment on the revision of Directive 2000/14/EC.

(*) 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), as amended by Directive 2005/88/EC of the European Parliament and of the Council of 14 December 2005 (OJ L 344, 27.12.2005, p. 44) corrected by Corrigendum (OJ L 165, 17.6.2006, p. 35) and by Regulation (EC) No 219/2009 of the European Parliament and of the Council of 11 March 2009 (OJ L 87, 31.3.2009, p. 109). The list of the relevant national transposing legislation is available in EUR-Lex.

This consultation aims to collect contributions from all interested parties, stakeholders, organisations and citizens in general potentially affected by the Directive on its functioning or by any modifications potentially made to it. Contributions are particularly sought from:
- institutions of national authorities;
- enterprises, business professionals, and business associations or organisations;
- consumer organisations, trade unions, research and academic institutions, and individual citizens.

Contact

DG Internal Market, Industry, Entrepreneurship and SMEs (DG GROW) - Unit C.3 Advanced engineering and manufacturing systems: GROW-C3@ec.europa.eu
Specific address for Noise Emission by Outdoor Equipment: GROW-DIR-NOISE@ec.europa.eu

About you

*1 You are welcome to answer the questionnaire in any of the 24 official languages of the EU. Please let us know in which language you are replying:

1

- Bulgarian
- Croatian
- Czech
- Danish
- Dutch
- English
- Estonian
- Finnish
- French
- German
- Greek
- Hungarian
- Irish
- Italian
- Latvian
- Lithuanian
- Maltese
- Polish
- Portuguese
- Romanian
- Slovenian
- Slovak
- Spanish
- Swedish

*2 You are replying:

- as an individual in your personal capacity
- in your professional capacity or on behalf of an organisation

*3 First name:

50 character(s) maximum

*4 Last name:

50 character(s) maximum

*5 E-mail address:

If you do not have an e-mail address, please write "Not available"

*6 Country of residence:

- Austria
- Belgium

- Bulgaria
- Croatia
- Cyprus
- Czech Republic
- Denmark
- Estonia
- Finland
- France
- Germany
- Greece
- Hungary
- Ireland
- Italy
- Latvia
- Lithuania
- Luxembourg
- Malta
- Netherlands
- Poland
- Portugal
- Romania
- Slovakia
- Slovenia
- Spain
- Sweden
- United Kingdom
- Other

*7 If "Other", please specify:

50 character(s) maximum

*8 Your contribution,

Note that, whatever option chosen, your answers may be subject to a request for public access to documents under Regulation (EC) N°1049/2001

- **can be published with your personal information** (I consent the publication of all information in my contribution in whole or in part including my name or my organisation's name, and I declare that nothing within my response is unlawful or would infringe the rights of any third party in a manner that would prevent publication)
- **can be published provided that you remain anonymous** (I consent to the publication of any information in my contribution in whole or in part - which may include quotes or opinions I express - provided that it is done anonymously. I declare that nothing within my response is unlawful or would infringe the rights of any third party in a manner that would prevent the publication)

*9 Respondent's first name:

50 character(s) maximum

*10 Respondent's last name:

50 character(s) maximum

*11 Respondent's professional e-mail address:

*12 Name of the organisation:

100 character(s) maximum

*13 Postal address of the organisation:

100 character(s) maximum

*14 Type of organisation:

Please select the answer option that fits best.

- Private enterprise
- Professional consultancy, law firm, self-employed consultant
- Trade, business or professional association
- Non-governmental organisation, platform or network
- Research and academia
- Regional or local authority (public or mixed)
- International or national public authority
- Other

*15 If "Other", please specify:

50 character(s) maximum

*16 How many employees does the company have?

- More than 250 employees (Large enterprise)
- Between 50 and 250 employees (Medium-sized enterprise)
- Between 10 and 49 employees (Small enterprise)
- Less than 10 employees (Micro enterprise)
- Self-employed (Micro enterprise)

*17 Please specify the type of organisation:

- Chamber of commerce
- Business organisation
- Trade Union
- Represenative of professions or crafts
- Other

*18 If "Other", please specify:

50 character(s) maximum

*19 Please specify the type of organisation:

- Think tank
- Research institution
- Academic institution

*20 Please specify the type of organisation:

- Regional public authority
- Local public authority
- Public-private sub-national organisation
- Network of public sub-national authorities
- Other

*21 If "Other", please specify:

50 character(s) maximum

*22 Please specify the type of organisation:

- Intergovernmental organisation
- EU institution, body or agency
- National parliament
- National government
- National public authority or agency

*23 Is your organisation included in the Transparency Register?

If your organisation is not registered, we invite you to register here, although it is not compulsory to be registered to reply to this consultation. Why a transparency register?

- Yes
- No
- Not applicable

*24 If so, please indicate your Register ID number:

20 character(s) maximum

5

*25 Country of organisation's headquarters:

- Austria
- Belgium
- Bulgaria
- Croatia
- Cyprus
- Czech Republic
- Denmark
- Estonia
- Finland
- France
- Germany
- Greece
- Hungary
- Ireland
- Italy
- Latvia
- Lithuania
- Luxembourg
- Malta
- Netherlands
- Poland
- Portugal
- Romania
- Slovak Republic
- Slovenia
- Spain
- Sweden
- United Kingdom
- Other

*26 If "Other", please specify:

50 character(s) maximum

*27 Your contribution,

Note that, whatever option chosen, your answers may be subject to a request for public access to documents under Regulation (EC) N°1049/2001

- **can be published with your organisation's information** (I consent the publication of all information in my contribution in whole or in part including the name of my organisation, and I declare that nothing within my response is unlawful or would infringe the rights of any third party in a manner that would prevent publication)
- **can be published provided that your organisation remains anonymous** (I consent to the publication of any information in my contribution in whole or in part - which may include quotes or opinions I express - provided that it is done anonymously. I declare that nothing within my response is unlawful or would infringe the rights of any third party in a manner that would prevent the publication)

6

*28 How familiar are you with the Outdoor Noise Directive 2000/14/EC?

- I have detailed knowledge of the Directive, its objectives, the limits and the requirements / obligations that it imposes
- I am aware of the existence of the Directive but not of all its specific contents
- I do not really know the Directive

*29 In which way are you related to the Directive 2000/14/EC and the outdoor equipment that it covers?

- I am a user of outdoor equipment
- I am exposed to noise emissions by outdoor equipment
- Other

*30 If "Other", please specify:

50 character(s) maximum

*31 Which type of enterprise is yours?

- Manufacturing company of outdoor equipment covered by Directive 2000/14/EC
- Rental / lease company of outdoor equipment covered by Directive 2000/14/EC
- Company / entity that uses outdoor equipment covered by Directive 2000/14/EC
- Other

*32 If "Other", please specify:

100 character(s) maximum

*33 Which type of stakeholders does your organisation / association represent?

Multiple choice allowed

- Manufacturing companies of outdoor equipment covered by Directive 2000/14/EC
- Rental / lease companies of outdoor equipment covered by Directive 2000/14/EC
- Companies / entities that use outdoor equipment covered by Directive 2000/14/EC
- Workers
- Consumers / Private users
- Environmental protection
- Other

*34 If "Other", please specify:

100 character(s) maximum

General information

35 Please state the extent to which you agree on the following statements on Directive 2000/14/EC:

	Strongly disagree	Disagree	Agree	Strongly agree	Do not know / No opinion
*The Directive has ensured harmonisation of rules and procedures across the EU for the covered outdoor equipment	○	○	○	○	○
*The Directive protects the health and well-being of citizens and the environment, by reducing permissible noise levels of outdoor equipment	○	○	○	○	○
*The Directive supports adaptation to technical progress for equipment in the scope	○	○	○	○	○
*The Directive has had an impact on competition from manufacturing companies outside of the EU	○	○	○	○	○

36 Please explain:

500 character(s) maximum

37 In your opinion, to what extent did Directive 2000/14/EC have effects to any of the following?

	Strong negative effect	Negative effect	No effect	Positive effect	Strong positive effect	Do not know / No opinion
*Research, development and innovation on equipment	○	○	○	○	○	○
*Noise performance of equipment	○	○	○	○	○	○
*Level of compliance of equipment / Prevention of non-compliant equipment on the market	○	○	○	○	○	○
*Information to customers / users	○	○	○	○	○	○
*Ability of sectorial SMEs to compete in the market	○	○	○	○	○	○

38 Please explain:

500 character(s) maximum

39 To what extent do you agree on the following statements?

	Strongly disagree	Disagree	Agree	Strongly agree	Do not know / No opinion
*By merging previous legislation (7 product and 2 procedure Directives), Directive 2000 /14/EC improved the effectiveness and internal coherence of EU legislation	○	○	○	○	○
*Directive 2000/14/EC complements other EU legislation / policy	○	○	○	○	○
*Directive 2000/14/EC complements non-EU / national legislation / policy	○	○	○	○	○
*There are overlaps / conflicts with other pieces of EU legislation (in terms of requirements, terminology, etc.)	○	○	○	○	○
*There are overlaps / conflicts with other non-EU / national legislation	○	○	○	○	○
*The implementation of Directive 2000/14 /EC through national transposition atcs was adequate and timey	○	○	○	○	○

40 Please explain:

500 character(s) maximum

41 To what extent do you agree on the following statements?

	Strongly disagree	Disagree	Agree	Strongly agree	Do not know / No opinion
*Noise emissions by outdoor equipment subject to noise limits (Article 12) have been reduced thanks to Directive 2000/14/EC	○	○	○	○	○

*Noise emissions by outdoor equipment subject to noise marking only (Article 13) have been reduced thanks to Directive 2000 /14/EC	○	○	○	○	○
*Noise emissions by outdoor equipment would have been reduced anyway without the Directive due to technological development and the market itself	○	○	○	○	○

42 Please explain:

500 character(s) maximum

*43 In your opinion, does the Directive have effects or impacts that would be unrelated directly to its policy goals (the policy goals of the Directive being: smooth functioning of the EU internal market, protection of health and well-being of citizens and of the environment)?

- ○ Yes
- ○ No
- ○ Do not know / No opinion

*44 If "Yes", please explain:

500 character(s) maximum

45 According to your experience, which sectors have the largest share of non-compliance with the requirements of the Directive, and what is the share of non-compliant products on the market?

	Very small (<5%)	Fairly small (5-10%)	Relatively small (11-20%)	Fairly significant (21-40%)	Very significant (>40%)	Do not know / No opinion
*Cleaning equipment	○	○	○	○	○	○
*Construction equipment	○	○	○	○	○	○
*Gardening equipment	○	○	○	○	○	○
*Loading and lifting equipment	○	○	○	○	○	○
*Power generators and cooling equipment	○	○	○	○	○	○
*Pumping and suction equipment	○	○	○	○	○	○
*Snowmobiles and snow groomers	○	○	○	○	○	○
*Waste collection, processing and recycling	○	○	○	○	○	○

46 Please explain:

500 character(s) maximum

*47 Do you think that third party conformity assessment procedures (with the intervention of a notified body) contribute to ensure that only compliant products are placed on the EU/EEA market?

- Not at all. Internal control or production ("self-assessment") should be enough in any case
- To a small or moderate extent. Internal control of production ("self-assessment") should be the most widely applicable conformity assessment procedure
- To a large or very large extent. Internal control of production ("self-assessment") should be used in very few cases only or even removed as a conformity assessment procedure
- Do not know / No opinion

48 Please explain / specify:

500 character(s) maximum

*49 Do you think that the implementation of the Directive cause excessive administrative burdens (information, collection and reporting of data, etc.)?

- Not at all. The administrative requirements of the Directive are adequate and proportionate
- To a small or moderate extent
- To a large or very large extent. The administrative requirements of the Directive are too heavy and mostly unnecessary
- Do not know / No opinion

50 Please explain / specify:

500 character(s) maximum

Specific information from companies

*51 What type of equipment does your organisation produce or distribute?

Multiple choice allowed

- Cleaning equipment
- Construction equipment
- Gardening equipment
- Loading and lifting equipment
- Power generators and cooling equipment
- Pumping and suction equipment
- Snowmobiles and snow groomers equipment

- [ ] Waste collection, processing and recycling equipment
- [ ] Other

*52 If "Other", please specify:

100 character(s) maximum

53 To what extent do you agree on the following statements?

	Strongly disagree	Disagree	Agree	Strongly agree	Do not know / No opinion
*Ensuring an internal market for outdoor equipment could be achieved at a lower cost with respect to noise reduction efforts	○	○	○	○	○
*Protecting the health and well-being of citizens and the environment by reducing the noise of outdoor equipment could be achieved at a lower cost	○	○	○	○	○
*SMEs are disadvantaged by the efforts they have to put into complying with the noise limits set in the Outdoor Noise Directive in comparison to larger enterprises	○	○	○	○	○
*SMEs are disadvantaged by the need to follow the third party conformity assessment procedure set in the Outdoor Noise Directive in comparison to larger enterprises	○	○	○	○	○

54 Please explain:

500 character(s) maximum

55 To what extent do you agree on the following statements?

	Strongly disagree	Disagree	Agree	Strongly agree	Do not know / No opinion
*The improvement in reduction of noise emissions produced by the Directive exceeds its compliance costs to my company	○	○	○	○	○

*The increase in market opportunities created by harmonised European noise limits exceeds the costs to my company of complying with the Directive	○	○	○	○	○
*Having the same noise limits across the EU /EEA increased competitiveness and/or market opportunities for my company	○	○	○	○	○

56 Please explain:

500 character(s) maximum

*57 In your opinion, are there any specific difficulties / barriers for stakeholders involved, in terms of practical and legal issues, in complying with the Directive?

- ○ Yes
- ○ No
- ○ Do not know / No opinion

*58 If "Yes", please explain. What type of support could be provided to cope with such difficulties / barriers?

500 character(s) maximum

*59 What difference does better noise performance (more reduced emissions) make to design and manufacturing costs of equipment?

- ○ No difference
- ○ Increase of costs of between 1% and 20%
- ○ Increase of costs of more than 20%
- ○ Decrease of costs of between 1% and 20%
- ○ Decrease of costs of more than 20%
- ○ Do not know / No opinion

*60 How the requirements of the Directive have effect in the innovation of equipment?

- ○ No effect
- ○ Negative effect
- ○ Positive effect
- ○ Do not know / No opinion

*61 What difference does better noise performance (more reduced emissions) make to the final price that your customers pay for equipment?

- ○ No difference
- ○ Increase of price (more expensive for customers) of between 1% and 20%

- Increase of price (more expensive for customers) of more than 20%
- Decrease of price (cheaper for customers) of between 1% and 20%
- Decrease of price (cheaper for customers) of more than 20%
- Do not know / No opinion

*62 Is information on noise emission level of equipment a criterion offered to and/or required by your customers?

- It is offered and required
- It is offered but not required
- It is not offered but required
- It is neither offered nor required

*63 Have you developed an internal quality assurance (QA) system to apply the full quality assurance procedure (Annex VIII to the Directive) to Article 12 equipment ?

- Yes
- No

64 Please provide, if possible, an estimation of the following cost indicators:

	Euro	Units / Time
Overall cost of the QA system (excluding cost of conformity assessment) (in €):		
Number of conformity assessments performed over a year:		
Average cost per conformity assessment procedure (in €):		
Average time to process (in weeks):		

65 Please provide, if possible, an estimation of the following cost indicators concerning the conformity assessment procedure(s) that you use the most:

	For Article 12 equipment: Internal control of production with assessment of technical documentation and periodical checking (Annex VI to the Directive)	For Article 12 equipment: Unit verification (Annex VII to the Directive)	For Article 13 equipment: Internal control of production (Annex V to the Directive)
Number of conformity assessments performed over a year			
Average cost per conformity assessment procedure (in €)			
Average time to process (in weeks)			

66 In your opinion, how the conformity assessment procedures of the Directive can be considered with regard to the following aspects?

	Very good	Good	Fair / Neutral	Poor	Very poor	Do not know / No opinion
* Adaptation to technical progress	○	○	○	○	○	○
* Implementation, administrative and information burdens	○	○	○	○	○	○
* Legal clarity and certainty	○	○	○	○	○	○
* Other	○	○	○	○	○	○

*67 If "Other", please specify:

100 character(s) maximum

68 Please explain:

500 character(s) maximum

69 On a scale from 0 to 5 (0: no efficiency; 5: top efficiency), how would you rate the efficiency of the conformity assessment procedures that you use the most, considering the following procedural aspects?

If not used, please indicate N/A

	For Article 12 equipment: Internal control of production with assessment of technical documentation and periodical checking (Annex VI to the Directive)	For Article 12 equipment: Unit verification (Annex VII to the Directive)	For Article 13 equipment: Internal control of production (Annex V to the Directive)
*Technical documentation required			
*Response time			
*Frequency of random checks			
*Test conducted by the notified body			
*Checks of notified bodies on the QA system			

Specific information from users

*70 What type of equipment do you usually buy / use?

Multiple choice allowed

- ☐ Cleaning equipment
- ☐ Construction equipment
- ☐ Gardening equipment
- ☐ Loading and lifting equipment
- ☐ Power generators and cooling equipment
- ☐ Pumping and suction equipment
- ☐ Snowmobiles and snow groomers equipment
- ☐ Waste collection, processing and recycling equipment
- ☐ Other

*71 If "Other", please specify:

100 character(s) maximum

*72 Where do you use such equipment usually?

Multiple choice allowed

- ☐ In domestic / residential environment
- ☐ In community areas
- ☐ In industrial environment
- ☐ In construction works
- ☐ Other

*73 If "Other", please specify:

100 character(s) maximum

*74 For how long do you usually use this equipment per day?

- ○ Less than 1 h
- ○ Between 1 h and 3 h
- ○ Between 3 h and 5 h
- ○ Between 5 h and 8 h
- ○ More than 8 h

*75 At what time of the day do you usually use this equipment?

- ○ Early morning (05.00 - 08.00)
- ○ During the day (08.00 - 18.00)
- ○ Late evening (18.00 - 22.00)
- ○ Night (22.00 - 05.00)
- ○ All day-and-night long

76 Please rank in order of importance (1st: the most important; 7th: the least important) the features that you consider when buying / renting outdoor equipment:

	1st	2nd	3rd	4th	5th	6th	7th
*Price	○	○	○	○	○	○	○
*Power / strength	○	○	○	○	○	○	○
*Energy efficiency	○	○	○	○	○	○	○
*Safety	○	○	○	○	○	○	○
*Weight	○	○	○	○	○	○	○
*Aesthetics / style	○	○	○	○	○	○	○
*Noise emission level	○	○	○	○	○	○	○
Other	○	○	○	○	○	○	○

*77 If "Other", please specify:

100 character(s) maximum

78 To what extent do you agree with the following statements?

	Strongly disagree	Disagree	Agree	Strongly agree	Do not know / No opinion
*I always prefer to buy / rent quieter equipment no matter what is the compromise with other aspects of the product	○	○	○	○	○
*I am happy to buy / rent quieter equipment as long as it offers similar features / performances to other noisier alternatives	○	○	○	○	○
*I am happy to buy / rent quieter equipment as long as it is not more expensive of other noisier alternatives	○	○	○	○	○
*I usually do not consider noise emission levels when buying / renting outdoor equipment	○	○	○	○	○

*79 Could you indicate the main reason for not taking noise emission levels into consideration when purchasing / renting outdoor equipment?

Multiple choice allowed

- [ ] I just consider the price of equipment
- [ ] I just consider other technical performance features o parameters of equipment
- [ ] I do not consider noise emission levels as really important
- [ ] Other

*80 If "Other", please specify:

100 character(s) maximum

*81 How much more would you be prepared to pay for quieter equipment in comparison to comparable, but noisier, alternatives?

- ( ) Nothing more (0%)
- ( ) A bit more (up to 5%)
- ( ) Moderately more (up to 10%)
- ( ) Quite a bit more (up to 15%)
- ( ) Substantially more (up to 20%)

*82 To what extent do you consider the noise marking on equipment clear for consumers and users?

- ( ) Not at all
- ( ) To a small extent
- ( ) To a moderate extent
- ( ) To a large extent
- ( ) To a very large extent

83 Please explain:

500 character(s) maximum

*84 Where do you look for information with regards to outdoor equipment characteristics?

Multiple choice allowed

- [ ] On general internet search engines (Google, Yahoo!, etc.)
- [ ] On specialised websites / on-line sectorial communities
- [ ] On product comparison websites
- [ ] On publications of manufacturing / rental / leasing companies in the internet, media, brochures…
- [ ] In specialised magazines
- [ ] I usually rely on the advice of shop assistants
- [ ] I usually rely on the advice of other experts, users or friends
- [ ] Other

*85 If "Other", please specify:

100 character(s) maximum

*86 Do you usually find information regarding noise emission levels of outdoor equipment?

- Never or rarely
- Sometimes
- Often
- Always
- Do not look for this information

*87 Do you think that an EU-wide on-line database of noise emission levels of outdoor equipment would be a useful resource for customers and users to help to select quieter equipment at the time of purchase?

- Yes, it would be a useful resource
- No, there are already other websites offering this type of information for different equipment
- No, this information is already provided by manufacturing / rental / leasing companies with the equipment itself
- No, I would still not consider noise emission levels when buying outdoor equipment
- Do not know / No opinion

88 Please specify:

200 character(s) maximum

*89 Have you ever received complaints, by your neighbours for example, with regards to the noise produced by your outdoor equipment?

- Never or rarely
- Sometimes
- Often
- Always

90 Could you please explain?

500 character(s) maximum

Specific information from exposed

*91 Which type of the following activities causing noise from outdoor equipment are you exposed the most to?

Multiple choice allowed

- Industrial noise from outdoor activity (from depots, freight handling, ports…)
- Construction / demolition noise (building sites, land redevelopment…)
- Community noise (cleaning and refuse collection, park and road maintenance, service vehicles, outdoor events services, building maintenance including aerial access platforms, power generation and pumping…)
- Neighbour noise from gardening tools (mowers, chainsaws, leaf blowers, shredders, brush cutters, trimmers…)

☐ Other

*92 If "Other", please specify:

500 character(s) maximum

*93 In which area(s) are you when exposed to noise from outdoor equipment the most?

Multiple choice allowed

☐ In my domestic / business environment
☐ In residential / community areas
☐ Near to industrial sites
☐ Near to construction / maintenance works
☐ Other

*94 If "Other", please specify:

200 character(s) maximum

*95 For how long does this kind of activities take place usually?

○ Less than 1 h
○ Between 1 h and 3 h
○ Between 3 h and 5 h
○ Between 5 h and 8 h
○ More than 8 h

*96 At what time of the day does this kind of activities take place usually?

○ Early morning (05.00 - 08.00)
○ During the day (08.00 - 18.00)
○ Late evening (18.00 - 22.00)
○ Night (22.00 - 05.00)
○ All day-and-night long

97 Are you aware of cases - without being directly exposed - where outdoor equipment is the cause of significant issues for the following types of noise disturbances?

	None	Less than 10 cases /year	Between 10 and 100 cases /year	Between 100 and 300 cases /year	More than 300 cases /year
*Industrial noise from outdoor activity (from depots, freight handling, ports…)	○	○	○	○	○

*Construction / demolition noise (building sites, land redevelopment…)					
*Community noise (cleaning and refuse collection, park and road maintenance, service vehicles, outdoor events services, building maintenance including aerial access platforms, power generation and pumping…)					
*Neighbour noise from gardening tools (mowers, chainsaws, leaf blowers, shredders, brush cutters, trimmers…)					
Other					

*98 If "Other", please specify:

500 character(s) maximum

*99 For which equipment type?

500 character(s) maximum

*100 Have you ever complained with authorities about noise disturbance?

- Yes, every time
- Yes, but only when it was really unbearable
- No, never

101 Could you indicate / describe what type of noise disturbance it was?

500 character(s) maximum

Options for change

*102 Would you be in favour of converting Directive 2000/14/EC into a Regulation (which would then be directly and uniformly applicable in each EU/EEA country)?

- Yes
- No
- Do not know / No opinion

103 Please explain:

500 character(s) maximum

25

104 Directive 2000/14/EC could be aligned to the "New Legislative Framework" (in particular to Decision No 768/2008/EC). To what extent would you be in favour of the following changes which would be introduced by such alignment?

	Not at all	To a little extent	To a moderate extent	To a great extent	Do not know / No opinion
* Aligning definitions and terminology to the body of EU legislation on health and safety of products in the internal market	○	○	○	○	○
* Establishing more specific definitions and obligations on economic operators (manufacturers, authorised representatives, importers and distributors)	○	○	○	○	○
* Establishing more specific requirements on conformity assessment bodies (notified bodies)	○	○	○	○	○
* Defining specific procedures on market surveillance	○	○	○	○	○
* Clarify the meaning, use and protection of CE marking	○	○	○	○	○

105 Please explain:

500 character(s) maximum

* 106 Do you consider that the scope of Directive 2000/14/EC (in particular, the lists of equipment subject to noise limits and those subject to noise marking only in Articles 12 and 13 respectively) should be modified?

- ○ No. The current scope is appropriate and the lists of equipment are complete and exhaustive
- ○ Yes. The current scope is no longer adequate and the lists of equipment need to be updated
- ○ Do not know / No opinion

107 Could you please provide an estimation of the costs associated to the following options related to modification of the scope of the Directive?

	No difference	Increase of costs of between 1% and 20%	Increase of costs of more than 20%	Decrease of costs of between 1% and 20%	Decrease of costs of more than 20%	Do not know / No opinion
* Removing equipment from the scope of the Directive	○	○	○	○	○	○
* Moving equipment from Article 12 (noise limits) to Article 13 (noise marking only)	○	○	○	○	○	○
* Moving equipment from Article 13 (noise marking only) to Article 12 (noise limits)	○	○	○	○	○	○
* Adding equipment to the scope in Article 12 (noise limits)	○	○	○	○	○	○
* Adding equipment to the scope in Article 13 (noise marking only)	○	○	○	○	○	○

* 108 Which kind of costs have you considered?

- ☐ Costs related to design and manufacturing of equipment
- ☐ Costs related to marketing of equipment
- ☐ Costs related to compliance / conformity assessment of equipment
- ☐ Costs related to information on equipment
- ☐ Costs related to administrative burdens
- ☐ Other costs

109 Please explain:

500 character(s) maximum

* 110 Do you consider that the noise limits set by Directive 2000/14/EC should be modified?

- ○ No. The current noise limits are reasonable and achievable, as well as adapted to the state of the art, so there is no need for change
- ○ Yes. The current noise limits need to be updated according to the state of the art, and/or to make them more reasonable and achievable
- ○ Do not know / No opinion

111 Please state the extent to which you agree with the following statements:

	Strongly disagree	Disagree	Agree	Strongly agree	Do not know / No opinion
*Noise limits should be maintained only for a limited set of equipment	○	○	○	○	○
*Noise limits should be established also for equipment currently not subject to any limit or to noise marking only	○	○	○	○	○
*All the noise limits set by the Directive should be made stricter	○	○	○	○	○
*All the noise limits set by the Directive should be made less strict	○	○	○	○	○

112 Please explain:

500 character(s) maximum

113 Could you please provide an estimation of the costs associated to the following options related to modification of noise limits?

	No difference	Increase of costs of between 1% and 20%	Increase of costs of more than 20%	Decrease of costs of between 1% and 20%	Decrease of costs of more than 20%	Do not know / No opinion
*More types of equipment to be subject to noise limits	○	○	○	○	○	○
*Less types of equipment to be subject to noise limits	○	○	○	○	○	○
*Making noise limits stricter	○	○	○	○	○	○
*Making noise limits less strict	○	○	○	○	○	○

114 Which kind of costs have you considered?

- [ ] Costs related to design and manufacturing of equipment
- [ ] Costs related to marketing of equipment
- [ ] Costs related to compliance / conformity assessment of equipment
- [ ] Costs related to information on equipment
- [ ] Costs related to administrative burdens
- [ ] Other costs

115 Please explain:

500 character(s) maximum

*116 Would you be in favour of changing the current marking system with a label indicating classes of sound power levels (as, for example, for energy efficiency class)?

- ( ) Yes. The current system is not appropriate to provide the necessary and useful information
- ( ) No. The current system is appropriate to provide the necessary and useful information
- ( ) Do not know / No opinion

117 Please explain:

500 character(s) maximum

*118 Do you think that changing label would be effective in increasing awareness on noise emission and in driving consumers' choice toward less noisy equipment?

- ( ) Not at all
- ( ) To a small extent
- ( ) To a moderate extent
- ( ) To a large extent
- ( ) To a very large extent
- ( ) Do not know / No opinion

*119 Directive 2000/14/EC provides for four conformity assessment procedures (Annexes V to VIII). In your opinion, is there any need for change at that respect?

- ( ) Yes, by adding more conformity assessment procedures from the modules of Decision No 768/2008/EC to the current ones
- ( ) Yes, removing the conformity assessment procedures involving a third party ("notified body") and keeping the internal control of production procedure only
- ( ) Yes, but keeping the same procedures and just aligning them to the modules of Decision No 768/2008/EC
- ( ) No, the conformity assessment procedures are appropriate and should be kept as they are
- ( ) Do not know / No opinion

120 Please explain:

500 character(s) maximum

121 Could you please provide an estimation of the costs associated to the following options related to modification of conformity assessment procedures?

	No difference	Increase of costs of between 1% and 20%	Increase of costs of more than 20%	Decrease of costs of between 1% and 20%	Decrease of costs of more than 20%	Do not know / No opinion
* Adding more conformity assessment procedures to the current ones in the Directive	○	○	○	○	○	○
* Removing the conformity assessment procedures involving a third party ("notified body") and keeping the internal control of production procedure only	○	○	○	○	○	○
* Keeping the same procedures and just aligning them to the modules of Decision No 768/2008/EC	○	○	○	○	○	○

*122 Which kind of costs have you considered?

- [ ] Costs related to design and manufacturing of equipment
- [ ] Costs related to marketing of equipment
- [ ] Costs related to compliance / conformity assessment of equipment
- [ ] Costs related to information on equipment
- [ ] Costs related to administrative burdens
- [ ] Other costs

123 Please explain:

500 character(s) maximum

*124 Do you think that the current status and use of standards as methods of measurement of airborne noise in Directive 2000/14/EC (noise test codes) should be modified?

- ( ) Yes. The current system is not appropriate to carry out the required measurements with respect to the state of the art
- ( ) No. The current system is appropriate to carry out the required measurements
- ( ) Do not know / No opinion

*125 Which kind of modification(s) would you support?

Multiple choice allowed

- [ ] Making reference in the legal text to the latest versions of the standards as made available by the relevant international and European standardisation organisations
- [ ] Removing references to standards from the legal text and linking the measurement methods to a separate list of standards of compulsory use, to be regularly updated
- [ ] Introducing the concept of "harmonised standards" of voluntary use conferring a "presumption of conformity" with the legal requirements, in a similar way as in the Machinery Directive 2006/42/EC
- [ ] Other

*126 If "Other", please specify:

500 character(s) maximum

*127 Do you think that the current requirements on collection of noise data (Article 16 of Directive 2000/14 /EC) should be modified?

- ( ) Yes, the current system is not appropriate with respect to the requirements of the Directive
- ( ) No, the current system is appropriate and feasible
- ( ) Do not know / No opinion

*128 Which kind of modification(s) would you support?

Multiple choice allowed

- [ ] Removing the obligation to send copies of declarations of conformity

32

- [ ] Sending copies of declarations of conformity to the Commission only
- [ ] Sending copies of declarations of conformity to Member States only
- [ ] Other

*129 If "Other", please specify:

500 character(s) maximum

Document upload and final comments

130 Please feel free to upload a concise document, such as a position paper.

Please note that the uploaded document will be published alongside your response to the questionnaire which is the essential input to this open public consultation. The document is an optional complement and serves as additional background reading to better understand your position.

The maximal file size is 1 MB

131 If you wish to add further information - within the scope of this questionnaire - please feel free to do so here.

1000 character(s) maximum

Annex 1.4 MSA-NB survey questionnaire

1. **In what country are you based? (list of covered countries)***

2. **Are you:***

   A Notified body
   A Market surveillance authority

EVALUATION OF THE NOISE DIRECTIVE

The first part of the questionnaire will cover the current functioning of the Directive.

Effectiveness

3. **Please state the extent to which you agree with the following statements**

   Strongly disagree
   Disagree
   Agree
   Strongly agree
   Do not know / No opinion

   The Directive has ensured harmonization of rules and procedures across the EU for the covered outdoor equipment
   By merging previous legislation (7 product Directives and 2 procedure Directives)[11], the Directive has simplified legislation and improved my activities
   The Directive protects the health and well-being of citizens and the environment, by reducing permissible noise levels of outdoor equipment
   The Noise directive has had an impact on competition from manufacturing companies outside of the EU *[if Agree/Strongly agree] Please specify*

4. **In your opinion, are there any specific difficulties / barriers for stakeholders involved (companies, public authorities, etc.) in terms of practical and legal issues, in complying with the Directive?**

   Yes
   No
   Do not know / No opinion

5. **[if yes to Q4] Please describe the barriers and indicate what type of support could be provided to cope with them**

[11] 79/113/EEC (construction plant + equipment), 84/532/EEC (construction plant + equipment), 84/532/EEC (compressors), 84/534 EEC (tower cranes), 84/535/EEC (welding generators), 84/536/EEC (power generators), 84/537/EEC (powered hand-held concrete-breakers and picks, 84/538/EEC (lawnmowers), 86/662/EEC (hydraulic excavators,, rope operated excavators, dozers, loaders excavators).

6. **Are there any other difficulties or barriers inhibiting an optimal functioning of the Directive and hindering the Directive from reaching its strategic objective of protecting the health and well-being of citizens and the environment?**

   Yes *(Please elaborate)*
   No

Relevance

7. **Please state the extent to which you agree with the following statements**

   Strongly disagree
   Disagree
   Agree
   Strongly agree
   Don't know / No opinion

   Today, there are still different noise limits across Europe for outdoor equipment not covered by Article 12 hindering the free circulation of such products
   Today, noise levels of outdoor equipment subject to conformity assessment (Article 12) are still too high to the extent that they pose a risk to the health and well-being of citizens and environment
   Today, noise levels of outdoor equipment only subject to marking (Article 13) are still too high to the extent that they pose a risk to the health and well-being of citizens and environment
   There are other relevant challenges that are not addressed by the Directive

   Please elaborate on your answers above

Efficiency

8. **To what extent do you agree with the following statements?**

   Strongly disagree
   Disagree
   Agree
   Strongly agree
   Do not know / No opinion

   On the whole, the benefits of the current Directive exceed its costs
   The increase in market opportunities created by harmonised European noise limits exceeds the costs to industry of complying with the Directive
   The improvement in reduction of noise emissions produced by the Directive exceeds its compliance costs to industry
   SMEs are disproportionately disadvantaged by the Directive's requirements in comparison to larger enterprises *[if Agree] Please specify*
   Ensuring an internal market for outdoor equipment could be achieved at a lower cost *[if Agree] Please specify*

Protecting the health and well-being of citizens and the environment by reducing the noise of outdoor equipment could be achieved at a lower cost *[if Agree] Please specify*

9. What has been the impact of the Directive on the administrative burdens for your organisation?

Strongly decrease (more than 25%)
Decrease (0-25%)
Neutral (0%)
Increase (0-25%)
Strongly increase (more than 25%)

Please specify

10. Are there specific elements of the Directive that require more resources (manpower, time, etc.) in comparison with others?

Coherence

11. To what extent do you agree with the following statements?

Strongly disagree
Disagree
Agree
Strongly agree
Do not know / No opinion

By merging previous legislation (7 product Directives and 2 procedure Directives[12]), Directive 2000/14/EC improved the internal coherence of EU legislation
Directive 2000/14/EC complements other EU legislation / policy
Directive 2000/14/EC complements non-EU legislation / policy
There are overlaps/conflicts with other EU legislation
There are overlaps/conflicts with other non-EU legislation

Please elaborate on your answers above

12. Are there national incentives to produce/buy/use less noisy products? (e.g. tax reduction, longer operating hours, etc.)

Yes *(Please specify)*
No

13. In your view, how effective can be such incentives in driving the market toward less noisy products?

[12] 79/113/EEC (construction plant + equipment), 84/532/EEC (construction plant + equipment), 84/532/EEC (compressors), 84/534 EEC (tower cranes), 84/535/EEC (welding generators), 84/536/EEC (power generators), 84/537/EEC (powered hand-held concrete-breakers and picks, 84/538/EEC (lawnmowers), 86/662/EEC (hydraulic excavators,, rope operated excavators, dozers, loaders excavators).

Not at all
To a small extent
To a moderate extent
To a large extent
To a very large extent

EU Added value

14. To what extent do you agree with the following statements?

Strongly disagree
Disagree
Agree
Strongly agree
Do not know / No opinion

The same results in relation to market fragmentation of outdoor equipment due to Noise limits would have been possible without the EU intervention

The same results in relation to the protection of health and well-being of citizens and environment from acoustic pollution from outdoor equipment would have been possible without the EU intervention

Please elaborate on your answers above

15. In your opinion, does the Directive have effects or impacts unrelated directly to its policy goals (smooth functioning of the EU internal market, protection of health and well-being of citizens and of the environment)?

Yes *(Please elaborate)*
No

16. Would you be in favour of repealing the Directive? That would imply the elimination of EU set Noise limits and related obligations, please notice that this could also mean the establishment of non-harmonised national noise limits

Yes
No

17.* What would happen if the Directive was repealed? Please consider possible consequences on *your activities, the industry, the market, consumer protection, environment and well-being

FORWARD LOOKING QUESTIONS

18. Would you be in favour of converting the Directive into a Regulation (as such the Regulation would be directly and uniformly applicable in each country leaving flexibility to Member States in the implementation)?

Yes

No

Please explain your choice

19. Directive 2000/14/EC could be aligned to the "New Legislative Framework". To what extent would you be in favour of the following changes:

Not at all
To a little extent
To a moderate extent
To a great extent
No opinion

Aligning definitions and terminology to the other EU legislation on health and safety of products in the internal market

Establishing more specific definitions and obligations on economic operators (manufacturers, authorised representatives, importers and distributors)

Establishing more specific requirements on conformity assessment bodies (notified bodies)

Defining specific procedures on market surveillance

Clarify the meaning, use and protection of CE marking

20. [Only NB] If the Directive was changed into a Regulation and it was aligned with the New Legislative Framework you would be subject to new obligations. For example, the New Legislative Framework foresees in particular that Notified Bodies are accredited and monitored by an accreditation body. Would you be able to satisfy the new requirements?

Yes, we already fulfil these criteria

Yes, but we would need to implement changes *(Please specify the changes and the related implementation costs)*

No, we would not be able to meet these criteria *(Please specify)*

21. [Only MSA] If the Directive was changed into a Regulation and it was aligned with the New Legislative Framework you would be subject to new obligations. For example, the New Legislative Framework requires updated market surveillance programmes, periodical review and assessment, the use of the Community Rapid Information System etc. Would you be able to satisfy the new requirements?

Yes, we already fulfil these criteria

Yes, but we would need to implement some changes *(Please specify the changes and the related implementation costs)*

No, we would not be able to meet these criteria *(Please specify)*

NOISE LIMITS

22. Please state the extent to which you agree with the following statements on Directive 2000/14/EC:

Strongly disagree

Disagree
Agree
Strongly agree
Do not know / No opinion

Noise limits set by the Directive are reasonable and achievable
Noise limits set by the Directive need to be updated and made stricter
The list of equipment covered by the Directive is exhaustive
The list of equipment covered by the Directive should include new types of equipment
Noise limits should be established also for equipment currently not subject to any limit or to noise marking only
Noise levels of outdoor equipment covered by noise limits (Article 12) have been reduced thanks to the Directive
Noise levels of equipment under Article 13 (only subject to labelling) have been reduced thanks to the Directive
Noise levels of outdoor equipment would have been reduced despite the Directive *[if Agree] Please specify*
Test codes need to be revised *[if Agree] Please specify*

23. To what extent is there demand from the market to provide quieter equipment from any of the following categories of customers?

Not at all
To a small extent
To a moderate extent
To a large extent
To a very large extent
Do not know / No opinion

Private users
Professional users (including companies)
Rental/lease companies
Public authorities

24. Are there sectors which have technical difficulty meeting the noise limits set by the Article 12 of the Directive? (multiple choice)

Do not know / No opinion
No difference across sectors
(II) construction equipment
(III) gardening equipment
(IV) loading and lifting equipment
(V) power generators and cooling equipment
(VI) pumping and suction equipment
(VIII) waste collection, processing and recycling

25. [If specific sectors are selected in Q24] Please specify the type of equipment for which is more difficult to meet the Noise limits set by the Directive: (Multiple choice)

List of types of equipment by sector selected

Sectors	Equipment under Article 12
2 Construction machinery	Builders' hoists for the transport of goods - CE powered Compaction - Vibratory rammers Compaction - Walk-behind vibrating rollers Compaction machines - Non-vibrating rollers Compaction machines - Other vibrating rollers Compaction machines - Vibratory plates Concrete-breakers and picks, hand-held - CE powered Concrete-breakers and picks, hand-held - Non-CE powered Dozers (< 500 kW) - Rubber tracked Dozers (< 500 kW) - Steel tracked Dozers (< 500 kW) - Wheeled Dumpers (< 500 kW) Excavator-loaders (< 500 kW) - Tracked Excavator-loaders (< 500 kW) - Wheeled Excavators, hydraulic or rope-operated (< 500 kW) Graders (< 500 kW) Loaders (< 500 kW) - Rubber tracked Loaders (< 500 kW) - Steel tracked Loaders (< 500 kW) - Wheeled Paver-finishers (excluding paver-finishers equipped with a high-compaction screed) - Without a compacting screed Paver-finishers (excluding paver-finishers equipped with a high-compaction screed) - With a compacting screed
3 Gardening equipment	□ Lawn trimmers/lawn edge trimmers □ Lawnmowers (excluding agricultural and forestry equipment, …) □ Motor hoes (< 3 kW)
4 Loading and lifting equipment	□ Construction winches (combustion-engine driven) - CE powered □ Lift trucks, CE driven, counterbalanced (excluding 'other counterbalanced…) □ Mobile cranes □ Tower cranes
5 Power generators and cooling equipment	□ Hydraulic power packs □ Power generators (< 400 kW) □ Welding generators
6 Pumping and suction equipment	□ Compressors (< 350 kW)
8 Waste collection, processing and recycling	□ Landfill compactors, loader-type with bucket (< 500 kW)

26. In your estimation, what is the current share of non-compliant products with Article 12 on the market by sector?

Very small (<5%)
Fairly small (5-10%)
Relatively small (11-20%)
Fairly significant (21-40%)
Very significant (>40%)
Do not know / No opinion

Construction equipment
Gardening equipment
Loading and lifting equipment
Power generators and cooling equipment
Pumping and suction equipment
Waste collection, processing and recycling

27. [for sectors above 11% in Q26] Please specify the type of equipment that is more at risk of non-compliance:

Sectors	Equipment under Article 12
2 Construction machinery	□ Builders' hoists for the transport of goods - CE powered □ Compaction - Vibratory rammers □ Compaction - Walk-behind vibrating rollers □ Compaction machines - Non-vibrating rollers □ Compaction machines - Other vibrating rollers □ Compaction machines - Vibratory plates □ Concrete-breakers and picks, hand-held - CE powered □ Concrete-breakers and picks, hand-held - Non-CE powered □ Dozers (< 500 kW) - Rubber tracked □ Dozers (< 500 kW) - Steel tracked □ Dozers (< 500 kW) - Wheeled □ Dumpers (< 500 kW) □ Excavator-loaders (< 500 kW) - Tracked □ Excavator-loaders (< 500 kW) - Wheeled □ Excavators, hydraulic or rope-operated (< 500 kW) □ Graders (< 500 kW) □ Loaders (< 500 kW) - Rubber tracked □ Loaders (< 500 kW) - Steel tracked □ Loaders (< 500 kW) - Wheeled □ Paver-finishers (excluding paver-finishers equipped with a high-compaction screed) - Without a compacting screed □ Paver-finishers (excluding paver-finishers equipped with a high-compaction screed) - With a compacting screed
3 Gardening equipment	□ Lawn trimmers/lawn edge trimmers □ Lawnmowers (excluding agricultural and forestry equipment, …) □ Motor hoes (< 3 kW)
4 Loading and lifting equipment	□ Construction winches (combustion-engine driven) - CE powered □ Lift trucks, CE driven, counterbalanced (excluding 'other counterbalanced…) □ Mobile cranes □ Tower cranes
5 Power generators and cooling equipment	□ Hydraulic power packs □ Power generators (< 400 kW) □ Welding generators
6 Pumping and suction equipment	□ Compressors (< 350 kW)
8 Waste collection, processing and recycling	□ Landfill compactors, loader-type with bucket (< 500 kW)

28. How has the share of non-compliant equipment reaching the market, or notifications of such equipment, changed since 2007?

Strongly decrease (more than 25%)
Decrease (0-25%)
Neutral (0%)
Increase (0-25%)
Strongly increase (more than 25%)
Do not know

29. Would you be in favour of reducing by 2-3 dB the noise limits for the following types of equipment already covered by Article 12?

Yes
No

Sectors	Article 12 - Reduced limit

II Construction machinery	□ Compaction machines - Vibratory plates □ Compaction - Vibratory rammers □ Compaction - Walk-behind vibrating rollers □ Concrete-breakers and picks, hand-held - CE powered
III Gardening equipment	□ Lawn trimmers/lawn edge trimmers □ Lawnmowers (excluding agricultural and forestry equipment, …)
IV Loading and lifting equipment	□ Lift trucks, CE driven, counterbalanced (excluding 'other counterbalanced…) □ Mobile cranes
V Power generators and cooling equipment	□ Power generators (< 400 kW) □ Welding generators
VI Pumping and suction equipment	□ Compressors (< 350 kW)

30. What would be the impact of lowering the current noise limits by 2-3 dB?

Strong negative impact
Moderate negative impact
No impact at all
Moderate positive impact
Strong positive impact
Do not know / No opinion

Environmental impact
Technical impact (e.g. on the machines' performance)
Economic impact on manufacturing companies
Economic impact on customers (consumers and professional users)
Administrative impact on manufacturing companies
Administrative impact on your organisation

Please provide more details on the potential impact of this change

31. Would you be in favour of applying noise limit reductions (implying an average reduction of 2-3dB) to the following types of equipment currently not covered by Article 12?

Yes
No

Sectors	New limits
1 Cleaning equipment	□ Combined high pressure flushers and suction vehicles □ High pressure flushers □ High pressure water jet machines □ Street washing machine □ Walk-behind road sweepers, no aspirators (motorized broom)
2 Construction machinery	□ Building site circular saw bench □ Concrete or mortar mixers □ Conveying and spraying machines for concrete and mortar □ Drill rigs - Percussive □ Hand-held stone cut-off saw □ Hydraulic hammers □ Joint cutters

	□ Piling equipment - Percussive □ Piling equipment - Vibrating + Static □ Stone chainsaw □ Truck mixers
3 Gardening equipment	□ Brush cutters □ Chain saws, portable - CE powered □ Chain saws, portable - Electric □ Grass trimmers/grass edge trimmers □ Hedge trimmers - CE powered □ Hedge trimmers - Electric □ Leaf blowers - CE powered □ Leaf blowers - Electric □ Leaf collectors - CE powered □ Leaf collectors - Electric □ Scarifiers □ Shredders/chippers □ Telescopic or pole pruner (a. CE-powered b. Electric)
4 Loading and lifting equipment	□ Aerial access platforms with combustion engine □ Lift trucks, CE driven, counterbalanced (others excl. Container handling) □ Portal cranes for harbours and terminals □ Reach stacker □ Straddle carrier □ Vehicle mounted loader cranes
5 Power generators and cooling equipment	□ Cooling equipment on vehicles □ Power generators (≥ 400kW)
6 Pumping and suction equipment	□ Suction vehicles □ Water pump units (not for use under water) - CE powered □ Swimming pool pumps
7 Snowmobiles and snow groomers	□ Snowmobiles
8 Waste collection, processing and recycling	□ Air suction refuse clearing vehicles □ Glass recycling containers □ Mobile sieve installations □ Mobile waste breakers (wood, concrete) □ Mobile waste containers □ Power sweepers □ Refuse collection vehicles

32. What would be the impact of setting such limits?

Strong negative impact
Moderate negative impact
No impact at all
Moderate positive impact
Strong positive impact
Do not know / No opinion

Environmental impact
Technical impact (e.g. on the machines' performance)
Economic impact on manufacturing companies
Economic impact on customers (consumers and professional users)
Administrative impact on manufacturing companies
Administrative impact on your organisation

Please provide more details on the potential impact of this change

33. Would you suggest any other changes to Article 12 of the Directive?

NOISE MARKING

34. To what extent do you believe the noise marking on machines is clear for the consumer or purchaser?

Not at all
To a small extent
To a moderate extent
To a large extent
To a very large extent

35. Would you be in favour of changing the current marking system with a label indicating classes of sound power levels (as, for example, for energy efficiency class)?

Yes
No

Please explain your choice

36. [if Yes to Q35] Do you think that changing label would be effective in increasing awareness on noise emission and in driving consumers' choice toward less noisy equipment?

Not at all
To a small extent
To a moderate extent
To a large extent
To a very large extent

37. Would you suggest any other changes to Article 13 of the Directive?

CONFORMITY PROCEDURES

38. Please state the extent to which you agree with the following statements

Strongly disagree
Disagree
Agree
Strongly agree
Do not know

By providing a choice between different conformity assessment procedures, the Directive adequately balances the need to for noise limits with flexibility for industry *[if Disagree] Please specify*

By providing a choice between different conformity assessment procedures, the Directive creates confusion and makes it more difficult for companies to get their products approved *[if Agree] Please specify*

[Only NB] Current legal remedies against non-conformity decisions allow adequate protection to companies *[if Disagree] Please specify*

39. [Only NB] Over a year, what percentage of your clients ask assistance with the self-certification procedure ex Article 13 - Evaluation prior to placing on the market and during production - Annex V "Internal control of production"

0%
Between 1% and 10%
Between 11% and 25%
Between 25% and 50%
More than 50%

40. [Only NB] Please provide the following data (please notice that numbers provided should concern only clients and conformity assessment procedures for products under the OND): *Please write 'n/a' if the data is not available*

Number of active clients to date
Number of active clients from EU, Switzerland, Liechtenstein, Norway, Iceland and Turkey
Number of conformity assessment procedures performed
Number of conformity assessment procedures performed on equipment produced in EU Switzerland, Liechtenstein, Norway, Iceland and Turkey

41. [Only NB] What is the approximate share of your clients by company size?

0%
Between 1% and 25%
Between 26% and 50%
Between 51% and 75%
Between 76% and 100%
Do not know

Less than 10 employees
Between 11 and 50 employees
Between 51 and 250 employees
More than 250 employees

42. [Only NB] Is there anything that could be improved in relation to the conformity assessment procedures? Please consider:

Technical documentation required
Time to perform the conformity assessment
Frequency of random checks
Test conducted by NB (not applicable to Article 13)
Check of NB on QA systems (not applicable to Article 13)

43. Would you be in favour of replacing the current third-party mandatory certification procedure for conformity assessment by a self-declaration of conformity by manufacturers?

Yes

No

44. What would be the impact of replacing the current third-party mandatory certification procedure for conformity assessment by a self-declaration of conformity by manufacturers?

Strong negative impact
Moderate negative impact
No impact at all
Moderate positive impact
Strong positive impact
Do not know/ No opinion

Environmental impact
Economic impact on manufacturing companies
Economic impact on customers (consumers and professional users)
Economic impact on your organisation
Administrative impact on manufacturing companies
Administrative impact on your organisation

Please provide more details on the potential impact of this change

OPTIONS COMPARISON

45. Please rank the following scenarios according to your order of preference:

Keeping the status quo
Repealing the Directive
Converting the Directive to Regulation aligning it to the New Legislative Framework
Changing current limits by extending the scope of Article 12 to some equipment currently covered by Article 13 and including new types of outdoor equipment in Article 13 but keeping the current conformity assessment procedures
Changing current limits by extending the scope of Article 12 to some equipment currently covered by Article 13 and including new types of outdoor equipment in Article 13 but replacing the current conformity assessment procedures with a company self-declaration

NOISE DATABASE

46. Have you ever used EC outdoor equipment noise database?

Never
Rarely
Sometimes
Often

47. [if not 'Never' to Q44] How would you rate the database on the basis of the following criteria:

Very poor
Poor
Average
Good
Very good

Usability
Amount of data collected
Reliability of data collected

48. Would you consider it useful to have access to a public database collecting noise emission levels for outdoor equipment?

Yes
No

Please explain your choice

49. Would you be in favour of having Notified Bodies fill in the database instead of companies?

Yes
No

Please explain your choice

50. What else could be done to improve the database and its utilisation?

MARKET SURVEILLANCE

The following questions concern market surveillance for noise limits in your country and in Europe.

51. To what extent do you agree with the following statements regarding market surveillance:

Strongly disagree
Disagree
Agree
Strongly agree
Do not know / No opinion

[NB] Market surveillance in my country is effective *[if Disagree] Please specify*
In the last 7 years there has been an improvement in the market surveillance and its effectiveness
Sufficient resources are allocated to market surveillance in my country

Sufficient resources are specifically allocated to the surveillance of noise emissions by outdoor equipment

Market Surveillance Authority in my country constantly works with Notified Bodies

Market surveillance in my country could be improved *[if Agree] Please specify and suggest how it could be improved*

Too many non-compliant products produced in my country reach the market

Too many non-compliant products from other EU countries reach the market

Too many non-compliant products from non-EU countries reach the market *[unless No opinion] Please specify how products imported from non-EU countries are monitored in your country*

Market surveillance in my country works well but there are MSs in which market surveillance is less effective compromising overall market surveillance *[if Agree] Please specify*

52. [if stated that they work with MSA in Q50] Please describe how the collaboration between Market Surveillance Authority and Notified Bodies takes place in your country

53. [Only MSA] Could you please provide data about resources allocated to market surveillance and in particular to the surveillance of Noise emissions by outdoor equipment? Please provide figures in EURO

Total resource

Resources earmarked to surveillance of Noise emissions by outdoor equipment

54. [Only MSA] How many people in your organisation are allocated to the surveillance of noise emissions by outdoor equipment?

Total number of people

Number of people (FTE) allocated to the surveillance of Noise emissions by outdoor equipment

55. [Only MSA] Do people allocated to the surveillance of Noise emissions by outdoor equipment receive specific training?

Yes, please specify

No

56. [Only MSA – if stated that they work with NB in Q52] Please describe how you collaborate with the Notified Bodies in your country

57. [Only MSA] what is the yearly average share of surveillance actions taken by type of surveillance initiative and how many of these resulted in actual breach? (please take into consideration the period 2007 – 2016. Please insert 'n/a' if a specific type of surveillance initiative is not available in your country)

Yearly average share of actions initiated

Yearly average share of breaches identified

Reactive market surveillance

Proactive market surveillance

Cooperation with customs authorities
Other, please specify

58. [Only MSA] What are the consequences in case of non-compliance with the OND for the seller, the producers and other people involved? (e.g. fine, seizure, etc.)

CLOSING QUESTIONS

59. Do you have any other comments/suggestions/observations that were not covered by the questions above (or any paper you may already have submitted to the Noise Expert group in 2015) that you feel should be taken into consideration?

Thank you very much for participating in our survey!

Annex 1.5 CATI interview questionnaire: Manufacturers

PART 1: About the company – To be prefilled as much as possible

1. Country in which the company interviewed is established (sample var)

2. Company size: (sample var)
Less than 10 employees
Between 11 and 50 employees
Between 51 and 250 employees
More than 250 employees

3. Company turnover: (sample var)
Less than 2 million Euro
Between 2 and 10 million Euro
Between 10 and 50 million Euro
More than 50 million Euro

4. Which kind of equipment does your company produce, is that;

(Multiple choice) Or read in from sample var tbd!

(I) cleaning equipment
(II) construction equipment
(III) gardening equipment
(IV) loading and lifting equipment
(V) power generators and cooling equipment
(VI) pumping and suction equipment
(VII) snowmobiles and snow groomers
(VIII) waste collection, processing and recycling

5. In which countries do you sell your products?
In My home country
In My home country and the rest of the EU
In My home country, the EU, and the EFTA or CH or TR
We sell our products across the globe

6. Based on answers Q4 (Based on answers Q4 (if Q4 = II only if Q4 is not equal II, randomise max 2 answers categories)

(if Q4 answer I is given;)

Do you manufacturer the following Cleaning equipment?

(List 5 devices Y/N answer)

(if Q4 answer II is given;)

Do you manufacturer the following Construction machinery?

(List 32 devices Y/N answer)

(if Q4 answer III is given;)

Do you manufacturer the following gardening equipment?

(List 17 devices Y/N answer)

(if Q4 answer IV is given;)

Do you manufacturer the following loading & lifting equipment?

(List 13 devices Y/N answer)

(if Q4 answer V is given;)

Do you manufacturer the following power generators & cooling equipment?

(List 5 devices Y/N answer)

(if Q4 answer VI is given;)

Do you manufacturer the following power pumpkin & suction equipment?

(List 5 devices Y/N answer)

(if Q4 answer VII is given;)

Do you manufacturer the following snow mobiles & snow groomers equipment?

(List 3 devices Y/N answer)

(if Q4 answer VIII is given;)

Do you manufacturer the following wasted collection & processing equipment?

(List 3 devices Y/N answer)

	A) Article 12 – Existing limit will be reduced	B) Article 12 - no change to current limits	C) Article 13 – Equipment for which limits are set for the first time	D) Article 13 - No change	E) New equipment – new limits
I Cleaning equipment			□ Combined high pressure flushers and suction vehicles □ High pressure flushers □ High pressure water jet machines		□ Street washing machine □ Walk-behind road sweepers, no aspirators (motorized broom)
II Construction machinery	□ Compaction machines - Vibratory plates □ Compaction - Vibratory rammers □ Compaction - Walk-behind vibrating rollers □ Concrete-breakers and picks, hand-held - CE powered	□ Builders' hoists for the transport of goods - CE powered □ Compaction machines - Other vibrating rollers □ Compaction machines - Non-vibrating rollers □ Concrete-breakers and picks, hand-held - Non-CE powered □ Dozers (< 500 kW) - Wheeled □ Dozers (< 500 kW) - Rubber tracked □ Dozers (< 500 kW) -	□ Building site circular saw bench □ Concrete or mortar mixers □ Conveying and spraying machines for concrete and mortar □ Drill rigs - Percussive □ Hydraulic hammers □ Joint cutters □ Piling equipment - Percussive □ Piling equipment - Vibrating + Static □ Truck mixers	□ Builders' hoists for the transport of goods (with electric motor) - Electric □ Building site band saw machine □ Compaction machines (explosion rammers only) □ Paver-finishers (equipped with a high-compaction screed) □ Road milling machines □ Trenchers	□ Hand-held stone cut-off saw □ Stone chainsaw

		Steel tracked □ Dumpers (< 500 kW) □ Excavators, hydraulic or rope-operated (< 500 kW) □ Excavator-loaders (< 500 kW) - Wheeled □ Excavator-loaders (< 500 kW) - Tracked □ Graders (< 500 kW) □ Loaders (< 500 kW) - Wheeled □ Loaders (< 500 kW) - Rubber tracked □ Loaders (< 500 kW) - Steel tracked □ Paver-finishers (excluding paver-finishers equipped with a high-compaction screed) - Without a compacting screed □ Paver-finishers (excluding paver-finishers equipped with a high-compaction screed) - With a compacting screed			
III Gardening equipment	□ Lawn trimmers/lawn edge trimmers □ Lawnmowers (excluding agricultural and forestry equipment, …)	□ Motor hoes (< 3 kW)	□ Brush cutters □ Chain saws, portable - CE powered □ Chain saws, portable - Electric □ Grass trimmers/grass edge trimmers □ Hedge trimmers - CE powered □ Hedge trimmers - Electric □ Leaf blowers - CE powered □ Leaf blowers - Electric □ Leaf collectors - CE powered □ Leaf collectors - Electric □ Scarifiers □ Shredders/chippers		□ Telescopic or pole pruner (a. CE-powered b. Electric)
IV Loading	□ Lift trucks, CE	□ Construction	□ Aerial access platforms	□ Constructio	□ Portal

and lifting equipment	driven, counterbalanced (excluding 'other counterbalanced …) □ Mobile cranes	winches (combustion -engine driven) - CE powered □ Tower cranes	with combustion engine □ Lift trucks, CE driven, counterbalanced (others excl. Container handling)	n winches (with electric motor) - Electric □ Conveyor belts □ Pipelayers	cranes for harbours and terminals □ Reach stacker □ Straddle carrier □ Vehicle mounted loader cranes
V Power generators and cooling equipment	□ Power generators (< 400 kW) □ Welding generators	□ Hydraulic power packs	□ Cooling equipment on vehicles □ Power generators (≥ 400kW)		
VI Pumping and suction equipment	□ Compressors (< 350 kW)		□ Suction vehicles □ Water pump units (not for use under water) - CE powered	□ Equipment for loading and unloading silos or tanks on trucks	□ Swimming pool pumps
VII Snowmobiles and snow groomers				□ Piste caterpillars □ Snow-removing machines with rotating tools (self-propelled, excl. attachments)	□ Snowmobiles
VIII Waste collection, processing and recycling		□ Landfill compactors, loader-type with bucket (< 500 kW)	□ Glass recycling containers □ Mobile waste containers □ Power sweepers □ Refuse collection vehicles		□ Air suction refuse clearing vehicles □ Mobile sieve installations □ Mobile waste breakers (wood, concrete)

7. What is your business model/type of client? (Multiple choice)
B2B
B2C
Public authority

{public authority such as city councils}

PART 2: General feedback (Drivers and problem)

8. What is the impact of having the same noise limits across Europe on your business in:?

Your home country	□ Much more difficult □ Somewhat more difficult □ No impact □ Somewhat easier □ Much easier □ Don't know
The rest of the EU (if selected in Q6)	□ Much more difficult □ Somewhat more difficult □ No impact □ Somewhat easier □ Much easier □ Don't know
Outside the EU (if selected in Q6)	□ Much more difficult □ Somewhat more difficult □ No impact □ Somewhat easier □ Much easier □ Don't know

9. To what extent is there demand from the market to provide quieter equipment from any of the following categories of customers?

Business	□ Not at all □ To a small extent □ To a moderate extent □ To a large extent □ To a very large extent □ Don't know
Consumers	□ Not at all □ To a small extent □ To a moderate extent □ To a large extent □ To a very large

	extent □ Don't know
Public authorities	□ Not at all □ To a small extent □ To a moderate extent □ To a large extent □ To a very large extent □ Don't know

If Q9 = to a large extent or to a very large extent go to Q10, otherwise go to Q11

10. According to your customers, are noise levels equally important for all the outdoor equipment that you produce or are there specific types of equipment for which noise level are more critical?
Most important for (list of equipment)
All equally important

11. What is the percentage of turnover that you spend on R&D and, in particular, on R&D on noise reduction?

R&D	□ 0% □ up to 10% □ between 11% and 25% □ Between 26% and 35% □ More than 35%
R&D on Noise reduction	□ 0% □ up to 5% □ between 6% and 10% □ Between 11% and 25% □ More than 26%

12. What difference does noise performance make to the final price that your customers pay?
□ No difference □ increase of 5% □ increase of between 6% and 10% □ increase of between 11% and 25% □ increase of Between 26% and 50% □ increase of More than 50% □ Equipment with better noise performance is cheaper for final customers □ don't know

13. To your knowledge, are there national incentives to produce/buy/use less noisy products? (e.g. tax reduction, longer operating hours, etc.)
a) Yes, please explain
open txt field
b) No
c) Don't' know

14. In your view, to what extent do/would such incentives drive the market toward less noisy products (e.g. tax reductions, longer operating hours, or others mentioned by interviewee)?
□ Not at all □ To a small extent □ To a moderate extent □ To a large extent □ To a very large extent

15. In your view, is the noise marking on equipment clear for your customers?
□ Very unclear □ Fairly unclear □ Fairly clear □ Very clear

16. Are you in favour of adapting the current marking system to indicate classes of sound power levels (as, for example, for energy efficiency labels)?
□ Not at all □ To a small extent □ To a moderate extent □ To a large extent □ To a very large extent

Conformity assessment –

(if any equipment is mentioned of first column (column A or B) of Q6 go to Q17, otherwise go to Q19)

17. Have you developed an internal quality assurance system verified and approved by a Notified body?

Y/N

(If Y go 17A, if N go to 18)

17A Can you provide me the ballpark overall costs for the set-up and maintenance of you QA system? (Excluding cost of conformity assessment) {IN EURO}

Open field, answer in 1000 EUR

{if respondent is reluctant to answer probe with categories}

□ Between 25,000€ and 50,000€
□ Between 50,000€ and 100,000€
□ Between 100,000€ and 500,000€
□ More than 500,000€

17B Can you provide me the average costs of your conformity assessment procedure on the system? {IN EURO}

Open field, answer in 1000 EUR

{if respondent is reluctant to answer probe with categories}

□ Less than 5,000€

□ Between 5,000€ and 10,000
□ Between 10,000€ and 25,000€
□ Between 25,000€ and 50,000€
□ More than 50,000€

17C What is the average time to process this (in days)
Open field, answer in days

{if respondent is reluctant to answer probe with categories}

□ *Less than 7 working days*
□ *Between 8 and 20 working days*
□ *Between 21 and 40 working days*
□ *Between 41 and 60 working days*
□ *More than 60 working days*

17D Can you provide me the number of conformity assessment performed per year?
Open field, answer in number

{if respondent is reluctant to answer probe with categories}

□ Less than 10
□ Between 11 and 25
□ Between 26 and 50
□ Between 51 and 100
□ More than 100

(If Y to 17, go to 19)

18. Which of the following conformity assessment procedures do you use the most?

a) You conduct the internal control of production and provide the Notified body with technical documentation. The Notified body assess this technical documentation and performs periodical checks on the products
b) The test is performed on individual machines and is carried out directly on the machine by the notified body

(single response)

In relation to this specific type of assessment[answer to Q18]

18A What is the number of conformity assessments performed over a year is that;
Open field, answer in number

{if respondent is reluctant to answer probe with categories}

□ *0 / not used*
□ *Less than 10*
□ *Between 11 and 25*
□ *Between 26 and 50*
□ *Between 51 and 100*
□ *More than 100*

18B What is the average time to process this (in days)
Open field, answer in days

{if respondent is reluctant to answer probe with categories}

□ *Less than 7 working days*
□ *Between 8 and 20 working days*
□ *Between 21 and 40 working days*
□ *Between 41 and 60 working days*
□ *More than 60 working days*

18C What are the Average Cost per procedure in EURO
Open field, answer in 1000 EUR

{if respondent is reluctant to answer probe with categories}

□ *Less than 1,000€*
□ *Between 1,000€ and 5,000€*
□ *Between 5,000€ and 10,000*
□ *Between 10,000€ and 25,000€*
□ *More than 25,000€*

(if any equipment is mentioned of third or fourth columns (column C or D) of Q6 go to Q19, otherwise go to Q20)

19. In relation to the CE Marking according to which You determine the measured sound power level, prepare the technical documentation and send the declaration of conformity to MS and Commission

19A What is the average time to process this (in days)
Open field, answer in days

{if respondent is reluctant to answer probe with categories}

□ *Less than 7 working days*
□ *Between 8 and 20 working days*
□ *Between 21 and 40 working days*
□ *Between 41 and 60 working days*
□ *More than 60 working days*

19B What are the Average Cost per procedure in EURO
Open field, answer in 1000 EUR

{if respondent is reluctant to answer probe with categories}

□ *Less than 1,000€*
□ *Between 1,000€ and 5,000€*
□ *Between 5,000€ and 10,000*
□ *Between 10,000€ and 25,000€*
□ *More than 25,000€*

PART 3: Potential Changes (Options) and consequences (Impacts)

(if any equipment is mentioned of first column (column A) of Q6 go to Q20, otherwise go to Q21)

20. *What would be the impact of reducing the noise limits by 2-3 dB for [List of equipment subject to change produced by the interviewed company on the following aspects:*

You can choose between;

□ Strongly decrease (more than 25%) □ Decrease (0-25%) □ Neutral (0%) □ Increase (0-25%) □ Strongly increase (more than 25%)

(read in answers one of the equipment in Q5 column A, randomising and ensuring that all types of equipment are covered)

a) R&D cost	□ Strongly decrease (more than 25%) □ Decrease (0-25%) □ Neutral (0%) □ Increase (0-25%) □ Strongly increase (more than 25%)
b) Price to consumer	□ Strongly decrease (more than 25%) □ Decrease (0-25%) □ Neutral (0%) □ Increase (0-25%) □ Strongly increase (more than 25%)
c) Your company's market share	□ Strongly decrease (more than 25%) □ Decrease (0-25%) □ Neutral (0%) □ Increase (0-25%) □ Strongly increase (more than 25%)
d) Technical performance of mentioned equipment	□ Strongly decrease (more than 25%) □ Decrease (0-25%) □ Neutral (0%) □ Increase (0-25%) □ Strongly increase (more than 25%)
e) Noise pollution caused by outdoor equipment	□ Strongly negative □ Negative □ Neutral □ Positive □ Strongly Positive

This question is only for manufacturers of equipment that will be subject to new limits (Q4)

(if any equipment is mentioned in the third or fifth columns (column C or E) of Q6 go to Q21, otherwise go to Q22)

21. *What would be the impact of setting noise limits (on average 2-3 dB lower than current levels) for new outdoor equipment on the following aspects*

You can choose between;

□ Strongly decrease (more than 25%) □ Decrease (0-25%) □ Neutral (0%) □ Increase (0-25%) □ Strongly increase (more than 25%)

(read in answers one of the equipment in Q5 column C or E, randomising and ensuring that all types of equipment are covered)

a) Administrative burden for carrying out the conformity	□ Strongly decrease (more than 15%) □ Decrease (0-15%) □ Neutral (0%) □ Increase (0-15%) □ Strongly increase (more than 15%)

assessment procedure	
b) R&D cost	□ Strongly decrease (more than 25%) □ Decrease (0-25%) □ Neutral (0%) □ Increase (0-25%) □ Strongly increase (more than 25%)
d) Cost of production	□ Strongly decrease (more than 25%) □ Decrease (0-25%) □ Neutral (0%) □ Increase (0-25%) □ Strongly increase (more than 25%)
e) Price to consumer	□ Strongly decrease (more than 15%) □ Decrease (0-15%) □ Neutral (0%) □ Increase (0-15%) □ Strongly increase (more than 15%)
f) Your company's market share	□ Strongly decrease (more than 15%) □ Decrease (0-15%) □ Neutral (0%) □ Increase (0-15%) □ Strongly increase (more than 15%)
g) Technical performance of mentioned equipment	□ Strongly decrease (more than 25%) □ Decrease (0-25%) □ Neutral (0%) □ Increase (0-25%) □ Strongly increase (more than 25%)
h) Noise pollution caused by the utilisation of outdoor equipment	□ Strongly negative □ Negative □ Neutral □ Positive □ Strongly Positive

These questions are for all manufacturers of equipment under Article 12 (Column A or B)

(if any equipment is mentioned in first two columns (column A and B) of Q6 go to Q22, otherwise go to Q23)

22. *What would be the impact of keeping the current noise limits, but replacing all of the current mandatory certification procedures for conformity assessment by a self-declaration of conformity by manufacturers?*

You can choose between;

□ Strongly decrease (more than 25%) □ Decrease (0-25%) □ Neutral (0%) □ Increase (0-25%) □ Strongly increase (more than 25%)
The impact on:

(program as a grid) no need to read type of equipment

a) Administrative burden for carrying out the assessment of noise levels	□ Strongly decrease (more than 25%) □ Decrease (0-25%) □ Neutral (0%) □ Increase (0-25%) □ Strongly increase (more than 25%)
b) Price to consumer	□ Strongly decrease (more than 25%) □ Decrease (0-25%) □ Neutral (0%) □ Increase (0-25%) □ Strongly increase (more than 25%)
c) Share of non-compliant equipment reaching the market	□ Strongly decrease (more than 25%) □ Decrease (0-25%) □ Neutral (0%) □ Increase (0-25%) □ Strongly increase (more than 25%)
e) Your company's market share	□ Strongly decrease (more than 25%) □ Decrease (0-25%) □ Neutral (0%) □ Increase (0-25%) □ Strongly increase (more than 25%)

23. *What would be the impact of eliminating all noise level limits and related obligations (please notice that this could also mean the establishment of not harmonised national noise limits) on the following aspects:*
You can choose between;

□ Strongly decrease (more than 25%) □ Decrease (0-25%) □ Neutral (0%) □ Increase (0-25%) □ Strongly increase (more than 25%)

(program as a grid) no need to read type of equipment

a) Your ability to sell your product everywhere in Europe	□ Strongly decrease (more than 25%) □ Decrease (0-25%) □ Neutral (0%) □ Increase (0-25%) □ Strongly increase (more than 25%)
b) Cost of R&D	□ Strongly decrease (more than 25%) □ Decrease (0-25%) □ Neutral (0%) □ Increase (0-25%) □ Strongly increase (more than 25%)
c) Price to consumer	□ Strongly decrease (more than 25%) □ Decrease (0-25%) □ Neutral (0%) □ Increase (0-25%) □ Strongly increase (more than 25%)
d) Your company's market share	□ Strongly decrease (more than 25%) □ Decrease (0-25%) □ Neutral (0%) □ Increase (0-25%) □ Strongly increase (more than 25%)
e) Noise pollution caused by the utilisation of outdoor equipment	□ Strongly decrease (more than 25%) □ Decrease (0-25%) □ Neutral (0%) □ Increase (0-25%) □ Strongly increase (more than 25%)
f) Proliferation of noisier equipment	□ Strongly decrease (more than 25%) □ Decrease (0-25%) □ Neutral (0%) □ Increase (0-25%) □ Strongly increase (more than 25%)

PART 5: Conclusion

24. Is there anything that we have not covered in the interview that you would like to add?

25. Would you agree to be re-contacted to take part in-an in-depth interview?
□ Yes □ No

Annex 1.6 CATI interview questionnaire: Rental and leasing companies

PART 1: About the company – To be prefilled as much as possible

26. Country in which the company interviewed is established (List of covered countries)
(sample var)

27. Type of interviewee (multiple choice):
Rental company
(sample var)

28. Do you rent: (Multiple choice)
(I) cleaning equipment
(II) construction equipment
(III) gardening equipment
(IV) loading and lifting equipment
(V) power generators and cooling equipment
(VI) pumping and suction equipment
(VII) snowmobiles and snow groomers
(VIII) waste collection, processing and recycling

(none of listed above (go to end)

29. In which countries do you rent these products, is that?
a. Only in your home country
b. In your home country and the rest of the EU
c. In your home country, the EU, EFTA + CH + TR
d. We rent our products across the globe

30. Based on answers Q3 (if Q3 = II only if Q3 is not II, randomise max 2 answers categories)
(if Q3 answer I is given;)
Do you rent the following Cleaning equipment?

(List 5 devices Y/N answer)

(if Q3 answer II is given;)

Do you rent the following Construction machinery?

(List 32 devices Y/N answer)

(if Q3 answer III is given;)

Do you rent the following gardening equipment?

(List 17 devices Y/N answer)

(if Q3 answer IV is given;)

Do you rent the following loading & lifting equipment?

(List 13 devices Y/N answer)

(if Q3 answer V is given;)

Do you rent the following power generators & cooling equipment?

(List 5 devices Y/N answer)

(if Q3 answer VI is given;)

Do you rent the following power pumpkin & suction equipment?

(List 5 devices Y/N answer)

(if Q3 answer VII is given;)

Do you rent the following snow mobiles & snow groomers equipment?

(List 3 devices Y/N answer)

(if Q3 answer VIII is given;)

Do you rent the following wasted collection & processing equipment?

(List 3 devices Y/N answer)

	A) Article 12 – Existing limit will be reduced	B) Article 12 - no change to current limits	C) Article 13 – Equipment for which limits are set for the first time	D) Article 13 - No change	E) New equipment – new limits
	11 equipment	22 equipment	35 equipment	13 equipment	14 equipment
I Cleaning equipment			□ Combined high pressure flushers and suction vehicles □ High pressure flushers □ High pressure water jet machines		□ Street washing machine □ Walk-behind road sweepers, no aspirators (motorized broom)
II Construction machinery	□ Compaction machines - Vibratory plates □ Compaction - Vibratory rammers □ Compaction - Walk-behind vibrating rollers □ Concrete-breakers and picks, hand-held - CE powered	□ Builders' hoists for the transport of goods - CE powered □ Compaction machines - Other vibrating rollers □ Compaction machines - Non-vibrating rollers □ Concrete-breakers and picks, hand-held - Non-CE powered □ Dozers (< 500 kW) - Wheeled □ Dozers (< 500 kW) - Rubber tracked □ Dozers (< 500 kW) - Steel tracked □ Dumpers (< 500 kW) □ Excavators, hydraulic or rope-operated (< 500 kW)	□ Building site circular saw bench □ Concrete or mortar mixers □ Conveying and spraying machines for concrete and mortar □ Drill rigs - Percussive □ Hydraulic hammers □ Joint cutters □ Piling equipment - Percussive □ Piling equipment - Vibrating + Static □ Truck mixers	□ Builders' hoists for the transport of goods (with electric motor) - Electric □ Building site band saw machine □ Compaction machines (explosion rammers only) □ Paver-finishers (equipped with a high-compaction screed) □ Road milling machines □ Trenchers	□ Hand-held stone cut-off saw □ Stone chainsaw □

		□ Excavator-loaders (< 500 kW) - Wheeled □ Excavator-loaders (< 500 kW) - Tracked □ Graders (< 500 kW) □ Loaders (< 500 kW) - Wheeled □ Loaders (< 500 kW) - Rubber tracked □ Loaders (< 500 kW) - Steel tracked □ Paver-finishers (excluding paver-finishers equipped with a high-compaction screed) - Without a compacting screed □ Paver-finishers (excluding paver-finishers equipped with a high-compaction screed) - With a compacting screed			
III Gardening equipment	□ Lawn trimmers/lawn edge trimmers □ Lawnmowers (excluding agricultural and forestry equipment, …)	□ Motor hoes (< 3 kW)	□ Brush cutters □ Chain saws, portable - CE powered □ Chain saws, portable - Electric □ Grass trimmers/grass edge trimmers □ Hedge trimmers - CE powered □ Hedge trimmers - Electric □ Leaf blowers - CE powered □ Leaf blowers - Electric □ Leaf collectors - CE powered □ Leaf collectors - Electric □ Scarifiers □ Shredders/chippers		□ Telescopic or pole pruner (a. CE-powered b. Electric)
IV Loading and lifting equipment	□ Lift trucks, CE driven, counterbalanced (excluding 'other counterbalanced …) □ Mobile cranes	□ Construction winches (combustion-engine driven) - CE powered □ Tower cranes	□ Aerial access platforms with combustion engine □ Lift trucks, CE driven, counterbalanced (others excl. Container handling)	□ Construction winches (with electric motor) - Electric □ Conveyor belts □ Pipelayers	□ Portal cranes for harbours and terminals □ Reach stacker □ Straddle carrier

					□ Vehicle mounted loader cranes
V Power generators and cooling equipment	□ Power generators (< 400 kW) □ Welding generators	□ Hydraulic power packs	□ Cooling equipment on vehicles □ Power generators (≥ 400kW)		
VI Pumping and suction equipment	□ Compressors (< 350 kW)		□ Suction vehicles □ Water pump units (not for use under water) - CE powered	□ Equipment for loading and unloading silos or tanks on trucks	□ Swimming pool pumps
VII Snowmobiles and snow groomers				□ Piste caterpillars □ Snow-removing machines with rotating tools (self-propelled, excl. attachments)	□ Snowmobiles
VIII Waste collection, processing and recycling		□ Landfill compactors, loader-type with bucket (< 500 kW)	□ Glass recycling containers □ Mobile waste containers □ Power sweepers □ Refuse collection vehicles		□ Air suction refuse clearing vehicles □ Mobile sieve installations □ Mobile waste breakers (wood, concrete)

31. Company size: (sample var)
Less than 10 employees
Between 11 and 50 employees
Between 51 and 250 employees
More than 250 Employees

32. What is your business model/type of client, is that? (Multiple choice)
B2B
B2C
Public authority

{public authority such as city councils}

PART 2: General feedback (Drivers and problem)

33. What is the impact of having the same noise limits across Europe on your business in;?

{Explanation of the harmonised European noise limits}

Your home country?	□ Much more difficult □ Somewhat more difficult □ No impact □ Somewhat easier □ Much easier □ Don't know
The rest of the EU (only if Q4 is b)	□ Much more difficult □ Somewhat more difficult □ No impact □ Somewhat easier □ Much easier □ Don't know
Outside the EU (only if Q4 is c)	□ Much more difficult □ Somewhat more difficult □ No impact □ Somewhat easier □ Much easier □ Don't know

34. To what extent would you take noise emission into account when purchasing new equipment to rent / lease (please distinguish by type of customer)?

Business	□ Not at all □ To a small extent □ To a moderate extent □ To a large extent □ To a very large extent □ Don't know
Consumers	□ Not at all □ To a small extent □ To a moderate extent □ To a large extent □ To a very large extent □ Don't know
Public authorities	□ Not at all □ To a small extent □ To a moderate extent □ To a large extent □ To a very large extent □ Don't know

If Q9 = to a large extent or to a very large extent go to Q10, otherwise go to Q11

35. Among the equipment that you rent mentioned earlier, where are noise levels most important?

{max 5 answers}

(Read in list of equipment mentioned in Q5, tickerbox, multiple choice, max 5 answers)

36. Is noise emission level a search criterion offered on your website for your customers?
Yes
No
Don't have a website

37. What difference does noise performance make to the final price that you pay upon purchase
□ No difference □ up to 5% □ between 6% and 10% □ between 11% and 25% □ Between 26% and 50% □ More than 50% □ Don't know

38. What difference does noise performance make to the final price that your customers pay?
□ No difference □ up to 5% □ between 6% and 10% □ between 11% and 25% □ Between 26% and 50% □ More than 50% □ Don't know

39. To your knowledge, are there national incentives to produce/buy/use less noisy products? (e.g. tax reduction, longer operating hours, etc.)
Yes, please explain
No
Don't know

40. In your view, to what extent do/would such incentives drive the market toward less noisy products (e.g. tax reductions, longer operating hours, or others mentioned by interviewee)?
□ Not at all □ To a small extent □ To a moderate extent □ To a large extent □ To a very large extent

41. In your view, is the noise marking on equipment clear for the consumer or purchaser?
□ Very unclear □ Fairly unclear □ Fairly clear □ Very clear

42. Are you in favour of adapting the current marking system to indicate classes of sound power levels (as, for example, for energy efficiency labels)?
□ Not at all □ To a small extent □ To a moderate extent □ To a large extent □ To a very large extent

PART 3: Potential Changes (Options) and consequences (Impacts)

(if any equipment is mentioned of first column (column A) of Q5 go to Q18, otherwise go to Q19)

43. *What would be the impact of reducing the noise levels of 2-3 dB for some equipment that is already subject to noise limits on the following aspects. You can choose between;*

□ Strongly decrease (more than 25%) □ Decrease (0-25%) □ Neutral (0%) □ Increase (0-25%) □ Strongly increase (more than 25%)

(read in answers one of the equipment in Q5 column A, randomising and ensuring that all types of equipment are covered)

a) Cost of equipment	□ Strongly decrease (more than 25%) □ Decrease (0-25%) □ Neutral (0%) □ Increase (0-25%) □ Strongly increase (more than 25%)
b) Price to consumer *{rent price }*	□ Strongly decrease (more than 25%) □ Decrease (0-25%) □ Neutral (0%) □ Increase (0-25%) □ Strongly increase (more than 25%)
c) Your company's market share	□ Strongly decrease (more than 25%) □ Decrease (0-25%) □ Neutral (0%) □ Increase (0-25%) □ Strongly increase (more than 25%)
d) Benefits for renters, consumers and users (e.g. tax reduction, longer operating hours, etc.)	□ Strongly decrease (more than 25%) □ Decrease (0-25%) □ Neutral (0%) □ Increase (0-25%) □ Strongly increase (more than 25%)
e) Technical performance of mentioned equipment	□ Strongly decrease (more than 25%) □ Decrease (0-25%) □ Neutral (0%) □ Increase (0-25%) □ Strongly increase (more than 25%)

f) Noise pollution caused by outdoor equipment	□ Strongly decrease (more than 25%) □ Decrease (0-25%) □ Neutral (0%) □ Increase (0-25%) □ Strongly increase (more than 25%)

(if any equipment is mentioned of third or fifth columns (Column C or E) of Q5 go to Q19, otherwise go to Q20)

44. *What would be the impact of setting noise limits (on average 2-3 dB lower than current levels) for outdoor equipment that is not currently covered by such limits on the following aspects:*

You can choose between;

□ Strongly decrease (more than 25%) □ Decrease (0-25%) □ Neutral (0%) □ Increase (0-25%) □ Strongly increase (more than 25%)

(read in answers one of the equipment in Q5 column C or E, randomising and ensuring that all types of equipment are covered)

a) Cost of equipment	□ Strongly decrease (more than 25%) □ Decrease (0-25%) □ Neutral (0%) □ Increase (0-25%) □ Strongly increase (more than 25%)
b) Price to consumer *{ rent price }*	□ Strongly decrease (more than 25%) □ Decrease (0-25%) □ Neutral (0%) □ Increase (0-25%) □ Strongly increase (more than 25%)
c) Your company's market share	□ Strongly decrease (more than 25%) □ Decrease (0-25%) □ Neutral (0%) □ Increase (0-25%) □ Strongly increase (more than 25%)
d) Benefits for renters, consumers and users (e.g. tax reduction, longer operating hours, etc.)	□ Strongly decrease (more than 25%) □ Decrease (0-25%) □ Neutral (0%) □ Increase (0-25%) □ Strongly increase (more than 25%)
e) Technical performance of mentioned equipment	□ Strongly decrease (more than 25%) □ Decrease (0-25%) □ Neutral (0%) □ Increase (0-25%) □ Strongly increase (more than 25%)
f) Noise pollution caused by outdoor equipment	□ Strongly decrease (more than 25%) □ Decrease (0-25%) □ Neutral (0%) □ Increase (0-25%) □ Strongly increase (more than 25%)

45. *What would be the impact on the following of eliminating all noise limits and related obligations, please notice that this could also mean the establishment of not harmonised national noise limits:*

You can choose between;

□ Strongly decrease (more than 25%) □ Decrease (0-25%) □ Neutral (0%) □ Increase (0-25%) □ Strongly increase (more than 25%)

(programmed as a grid)

a) Your ability to rent your product everywhere in Europe	□ Strongly decrease (more than 25%) □ Decrease (0-25%) □ Neutral (0%) □ Increase (0-25%) □ Strongly increase (more than 25%)
b) Of the cost of equipment	□ Strongly decrease (more than 25%) □ Decrease (0-25%) □ Neutral (0%) □ Increase (0-25%) □ Strongly increase (more than 25%)
c) Price to *{ rent price }* consumer	□ Strongly decrease (more than 25%) □ Decrease (0-25%) □ Neutral (0%) □ Increase (0-25%) □ Strongly increase (more than 25%)
d) Competitive advantage of renting quieter equipment	□ Strongly decrease (more than 25%) □ Decrease (0-25%) □ Neutral (0%) □ Increase (0-25%) □ Strongly increase (more than 25%)
e) Noise pollution caused by outdoor equipment	□ Strongly decrease (more than 25%) □ Decrease (0-25%) □ Neutral (0%) □ Increase (0-25%) □ Strongly increase (more than 25%)

PART 5: Conclusion

46. Is there anything that we have not covered in the interview that you would like to add? Please explain

47. Would you agree to be re-contacted to take part in-an in-depth interview?

□ Yes □ No

ANNEX II: METHODS AND ANALYTICAL MODELS

2.1 Data analysis

2.1.1 Economic impact

The economic impact of the policy options refers primarily to the costs that must be borne by manufacturing companies. These costs are:

- Cost of the noise marking/ self-assessment
- Cost of conformity assessment procedures (3 types)
- R&D costs.

The main source of information for the estimation of these cost items are the CATI interviews conducted with manufacturing companies.

The model for the estimation of the administrative costs, noise marking and conformity assessment procedures, was based on the following items:

- Average costs of procedure;
- Average turnaround (days);
- Average number of procedures per year (only for conformity assessment);
- Average number of equipment types produced by companies;
- Cost of setting up the internal quality assurance system (Annex VIII);
- Cost of conformity assessment on the internal quality assurance system.

The average yearly cost of a specific procedure per equipment type (EUR) was calculated as:

$$\frac{\text{Average costs of procedure x Average number of procedures per year}}{\text{Average number of equipment types produced by companies}}$$

The total administrative burden for the conformity assessment was calculated multiplying the average cost of the three procedures (weighted on the basis of the CATI results) per the number of companies manufacturing equipment falling under Article 12 (or number of companies producing equipment for which a new limit is proposed). When different variants of the same type of equipment are subject to different requirements (e.g. Power generators have different requirements depending on their kW) a weighting factor was applied to the number of companies producing that specific type of equipment (based on the assumption that some companies will produce all variants while others will focus only on specific ones).

The total cost of administrative burden for the noise marking was calculated in a similar manner.

For R&D costs the model was based on:

- Estimated sector turnover;
- Number of companies in the sector and affected by changes to the OND;
- % of turnover spent on R&D;
- % of R&D expenditure spent on noise reduction;
- Impact on R&D expenditure in case of new or lower noise limits.

R&D expenditure per sector was calculated as a percentage of the sector turnover on the basis of the expenditure reported by manufacturers interviewed through the CATI (on average 5%).

R&D expenditure of companies affected by the OND was calculated as follows:

$$\frac{\text{Total sector expenditure on R\&D} \times \text{Estimated number of companies affected}}{\text{Estimated number of companies}}$$

2.1.2 Environmental impact

The environmental impact of changes to the Directive can be expressed in terms of reduced noise levels at the receiver, reduced numbers of annoyed persons, or in terms of the reduced environmental impact indicator EI as done in the NOMEVAL and ODELIA studies and explained in section 3.3.

Reductions of noise levels at dwelling facades can be translated into monetised benefits, for road traffic noise although for outdoor equipment there are no standard methods to do this. The large variety of outdoor equipment has strongly varying operating times, and conditions. No noise valuation methods or dose-effect relationships are available specifically for this source. Therefore, for this purpose, known valuation figures for health and amenity (linked to annoyance) for traffic noise are applied but adjusted for the proportion of the annual operating time.

Socio-economic benefits of reduction of road traffic noise, in general, are mostly expressed in terms of reduced L_{DEN} and L_{night} noise levels, especially for long-term exposure. Annoyance is generally associated with the annual average L_{DEN} level at the dwelling facade (equivalent sound pressure level weighted for day-evening-night), whereas sleep disturbance and associated effects on heart disease are associated with the night level L_{night}. As most outdoor equipment operates during the daytime (Exceptions are sweepers, refuse vehicles, cooling equipment and power generators that may also operate at night), for the purpose of this study only the valuation of the reduction in the L_{DEN} due to the daytime noise level L_{day} is considered.

For annoyance, the 2003 European position paper (EU, 2003) recommends a valuation figure based on willingness to pay (e.g. the value people perceive) or Hedonic pricing (property value change) of €25 per dwelling per annum per dB noise reduction in 2002. This valuation is referred to as 'amenity' from here on and considered to be based on awareness of noise impact. It implicitly includes some health effects. Taking 1.97% inflation into account, this figure is set at EUR 35.52 in 2020. This is a fixed value for noise reduction independent of the actual noise level, as proposed in the EU position paper. In reality, the valuation may be much higher, so this approach actually gives a conservative estimate for benefits.

The annual benefit for amenity (due to reduced annoyance) B_A due to the operation of a single equipment unit is calculated from:

$$B_A = V_A * NH * NR$$

where V_A = benefit per household per dB noise reduction for amenity (including health), NH = number of households, NR = dB noise reduction of the average equivalent noise level L_{DEN} at the facade.

The valuation figure could be considered to apply a progressively increasing value with increasing absolute noise level, but this is not strictly necessary as a higher noise level

automatically affects more people over a larger range, and the focus here is on noise reduction.

For outdoor equipment, there is no standard noise valuation method or dose-effect relationship. The large variety of outdoor equipment has strongly varying operating times, and conditions and no noise valuation methods or dose-effect relationships are available specifically for this source. Therefore, for the purpose of this study, known valuation figures for health and amenity (linked to annoyance) for traffic noise are applied but adjusted for the fraction of operating time T_{op} in the whole year T_{total}:

$$V_{A,op} = V_A * T_{op}/T_{total}$$

The annual benefits for each equipment type are multiplied by the number of equipment N_{eq}.

$$B_{tot,eq} = V_{A,op} * NH * NR * N_{eq}$$

For example, if a gardening tool is working 5 hours per year and a noise reduction of 2 dB is applied, the amenity benefit B_A per household per equipment piece is calculated from:

$$B_A = V_{A,op} * NR * 5/(24h*365) = € 35.52 * 2 * 5/(24h*365)$$
$$= € 0.0383 \text{ /household/unit/year}$$

The number of affected households NH depends strongly on the noise level above a certain threshold, taken here at 55 dB(A), considering the potential effects of other sources in urban areas and sound levels above which annoyance can be expected. This number can be estimated by taking an average population density within an area with a sound pressure level of 55 dB(A) or higher. The number of affected households rises exponentially with the sound power level. So, a high sound power level will affect far more households than a low one. NH is calculated from:

$NH = pd * 10^{-6} * S / ph$,
where pd = population density in persons/km^2,
S = affected area in m^2
and ph = number of persons per household

For the purpose of monetisation, a single average population density for residential areas of 504 persons per km^2 is chosen, based on the EU average. This will actually be larger in densely populated urban areas and smaller in rural areas.

The number of inhabitants per household is taken at 2.4 as applied in other studies. (see Eurostat Household composition statistics, May 2018, data 2007-2017)

The affected area S depends on its radius R where

$$R = 10^{(LWg,avg - 9 - 55)/20}$$

$$S = \pi R^2$$

with L_{Wgavg} the guaranteed average sound power level in dB, and 55 dB(A) as the threshold level.

Noise levels at the façade depend on the sound power level of the source, the distance between source and receiver, and propagation effects including reflections and barriers.

The noise level can be calculated from the sound power level and the propagation terms as done for standard environmental calculations.

In one year, the benefits are proportional to the number of equipment types which are noise reduced, which increases each year as equipment is replaced by products that fulfil the new regulation. So, in the first year after coming into force, assuming a lifetime of 10 years, one tenth of all equipment is assumed to be replaced, after five years half is replaced and so on, until after ten years, all equipment is replaced.

In addition, the fraction of equipment which is actually affected by new limits is taken at 30% for each limit reduction step, as a proportion of equipment models may already be under the limit.

In benefits analysis over the past period 2000-2017, the benefits each year are adjusted for the real average inflation rate of 1.97%. The accumulated benefits over this period are calculated by summation over all years.

In the forward analysis 2020-2040, the benefits each year are adjusted for the interest rate of 1% on the valuation figure, but also by a 4% discount rate for each successive year. Then the accumulated benefits over a period of 20 years are calculated by adding the benefits in each year.

Uncertainty and variation in inputs for benefits

The estimates of benefits depend strongly on the various input parameters which each have ranges of uncertainty.

Variation in valuation can be a factor 2 or more upward, but has been based on a conservative figure of 25 Euro/dB/household/year in 2002 corrected for inflation. So a factor 2 higher valuation implies double the benefits.

The number of affected households depends on population density (taken at European average of 504 persons/km^2), the number of persons per household (taken at 2.4) and the area with sound pressure levels above the threshold level. This area depends on the sound power level of the source and the choice of threshold level, taken here at Lp=55 dB(A) which is just above common daytime background noise levels in urban areas.

The uncertainty in the average guaranteed sound power levels is unknown, but could easily be ± 3 dB.

The population density can be higher in some urban areas but also much lower in rural areas. As inhabited areas are most relevant, a variation of 250-1000 persons/km^2 may be found depending on the type of inhabited area.

The number of equipment is based on fleet estimates from the ODELIA study and updated where possible for this impact assessment. For new limits or limit changes, the percentage of equipment affected is set at 30%. If this is changes to 50% or 80%, then the benefits change directly in proportion. The 30% of affected products is based on the proposed limits and corresponding pass rates in the ODELIA study which are often found when a limit change is 1-2 dB (see database graphs in the ODELIA study Annex C, for example for Brush cutters and other Article 13 equipment with sufficient data points).

The uncertainty in equipment fleet numbers is deemed to be around ± 25% although it may be larger for some specific types.

The effective noise reduction per equipment type depends on:

- the limit reduction, for equipment types with past or future limit changes
- -1 dB for equipment introduced into in Article 13
- -1 to -2 dB for equipment moved from Article 13 to Article 12 as in ODELIA proposal
- +2 dB for all equipment types in the case of repeal of the OND
- +0.9 dB in the case of the baseline, due to 22% growth over 20 years.

For each dB in noise reduction, the benefits are doubled.

A range in the benefits can be given based on the following:

Table 4: Input parameter ranges for benefits calculation

Parameter	Minimum value	Maximum value
Valuation	80%	400%
Population density	50%	200%
Noise reduction	-0.5 dB, 50%	0.5 dB , 150%
Average LWg	-3 dB , 75%	+3 dB , 125%
Equipment fleet	75%	125 %
Combined standard uncertainty	53%	260%

A uniform (rectangular) distribution is assumed for all the input parameters.

For a benefit of 1 billion Euros, an uncertainty range follows of 530 million – 2600 million Euros.

Negative impacts due to fleet growth

As the size of the equipment fleet is assumed to grow each year by around 1%, following average growth, this is also taken into account in all scenarios. In the baseline scenario, this is actually the main factor affecting environmental impact. At a growth rate of 1%, over a 20 year period, this is equivalent to all affected equipment increasing the noise emission by 0.86 dB. Per annum, it amounts to 0.0432 dB. In particular, this increase affects all OND equipment types.

This benefit $B_{A,gr}$ is negative due to a noise increase, and is calculated in analogy with the amenity benefit:

$$B_{A,gr} = V_A.NH.NR_{gr}$$

where NR_{gr} = dB noise reduction of the average equivalent noise level at the façade, due to increased numbers of equipment (and is therefore negative).

So for the baseline scenario, when using 2020 as reference point, benefits due to fleet growth only may be negative, in the repeal scenario benefits more so due to an expected noise level increase, and in the limits scenario, the benefits are positive, as the lower noise levels well outweigh the growth effects.

The repeal and limits scenario can be combined with the baseline scenario if fleet growth is also to be taken into consideration:

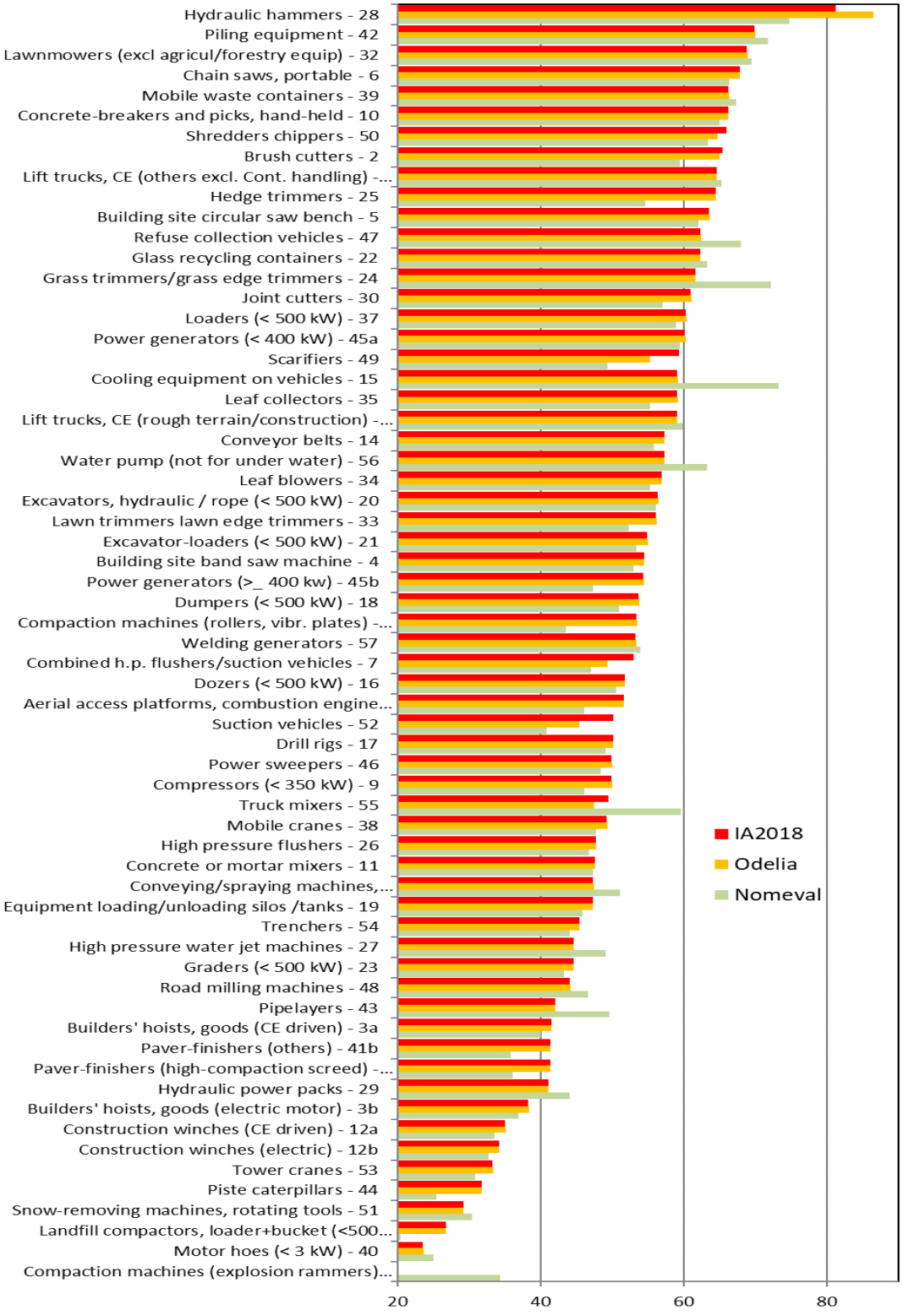
Baseline scenario: Benefits = $BA_{,gr}$

Repeal scenario: Benefits = BA + $BA_{,gr}$

Limits scenario: Benefits = BA + $BA_{,gr}$

An updated calculation of the Environmental Impact indicator EI was made taking most recent data into account for fleet size and operating times. In Figure 3-1 the environmental impact is shown for each equipment type as calculated in the NOMEVAL and ODELIA studies, together with the most recently updated estimate. Equipment with a high EI level is either numerous, very noisy or both.

Figure 2-1: Environmental impact indicator as estimated in the NOMEVAL and ODELIA studies, and adjusted with most recent new data, mainly fleet numbers and some operation times (IA 2018)



2.2 Environmental impact indicator

The Environmental Impact indicator (EI) as applied in the NOMEVA and ODELIA studies is summarised here. The rated sound power level averaged over a year is defined as:

$$L_{WArated,yeareq} = L_{WA,guaranteed} + C_{evening/night} + C_{tonal/imp} + C_{intermittent} + C_{opcon} + 10\lg\left(\frac{n_{months} n_{days} t_{dayuse}}{364 \cdot 24 \cdot 60}\right) \quad \text{(A1)}$$

where

n_{months} number of months per year in use;

n_{days} number of days per month in use;

t_{dayuse} minutes per day in use;

$C_{evening/night}$ adjustment for evening/night use (0 or 5 dB)

$C_{tonal/imp}$ adjustment for tonal and/or impulsive sound character (0 or 5 dB)

$C_{intermittent}$ adjustment for sound character due to intermittent use (0, 3 or 6 dB)

C_{opcon} adjustment for difference in operating condition between normal use and testing conditions (0 or 3 dB).

These terms are listed for each equipment type in Table 5.

The environmental impact indicator per equipment type and situation type is defined as:

$$EI_{\text{equip,situ}} = 10\lg\left(\frac{364.\sum_{i=i\min}^{i\max} \mathrm{N}_{\text{equip,situ}} \mathrm{D}_{\text{equip,situ},i} 10^{L_i/10}}{\sum_{\substack{equip,\\ situ}} (\mathrm{N}_{\text{equip,situ}} \sum_{i=i\min}^{i\max} \mathrm{D}_{\text{situ,i}})}\right) \quad \text{(A2)}$$

Averaged over all situations the EI per equipment type is

$$EI_{equip} = 10\lg\left(\sum_{situ} 10^{EI_{equip,situ}/10}\right) \quad \text{(A3)}$$

where

$N_{equip,situ}$ number of equipment in specific situation, corrected for percentage usage during year (%use)

L_i sound pressure level class *i* (5 dB classes) as obtained for a noise source with sound power level $L_{WA,ratedyeareq}$ based on database average of $L_{WA,guaranteed}$

$D_{equip,\ situ,i}$ Distribution factor: number of inhabitants in each sound level band *i* for each equipment type (equip) and each situation (situ)

$D_{situ,i}$ Distribution factor: number of inhabitants in each sound level band *i* for all equipment types and each situation (situ)

The factor 364 and the denominator in formula A2 are for normalisation. In the NOMEVAL report these were implicitly included in the distribution factor $D_{equip,situ,i}$.

Table 5 shows the input data used for the EI calculations.

Legend:

L_{WAg}: average guaranteed sound power level from databases as in ODELIA study

C_{op}: correction for operating condition

$C_{e/n}$: evening/night usage correction

$C_{t/p}$: correction for tonality or impact

C_{int}: correction for intermittent noise

n_{month}: number of months/year in use

n_{day}: number of days/year in use

t_{use}: Usage time per day, minutes

Env: Type of environment A-F (see the NOMEVAL report)

%use: percentage of time used per environment type

N: Fleet size /1000

In use %: percentage of fleet active

Table 5: Input data for EI indicator

no	Equipment	$L_{WA,g}$	C_{op}	$C_{e/n}$	$C_{t/p}$	C_{int}	n_{month}	n_{day}	t_{use}	Env	%use	N_{EU25} (1000x)	in use (%)
1	Aerial access platforms, combustion engine - 1	100	3	0	0	6	10	20	180	D	100%	94	75%
2	Brush cutters - 2	108	3	0	5	6	5	1	60	B	50%	12000	75%
							5	3	60	F	50%		75%
3a	Builders' hoists, goods (CE driven) - 3a	100	3	0	0	0	10	20	60	D	100%	52	75%
3b	Builders' hoists, goods (electric motor) - 3b	93	3	0	5	0	10	20	60	D	100%	52	75%
4	Building site band saw machine - 4	110	0	0	5	6	10	20	60	D	100%	26	75%
5	Building site circular saw bench - 5	108	0	0	5	6	10	20	60	D	100%	210	75%
6	Chain saws, portable - 6	110	0	0	5	6	3	3	60	B	50%	25000	75%
							3	3	60	F	50%		75%
7	Combined h.p. flushers/suction vehicles - 7	109	0	0	0	3	10	10	240	C	100%	50	75%
8a	Compaction machines (explosion rammers) - 8a	104	0	0	5	0	10	10	60	D	100%	0	75%
8b	Compaction machines (rollers, vibr. plates) - 8b	104	3	0	5	0	10	10	60	D	100%	200	75%
9	Compressors (< 350 kW) - 9	95	0	0	0	0	10	5	120	D	100%	2000	75%
10	Concrete-breakers and picks, hand-held - 10	103	3	0	5	6	10	10	120	D	100%	420	75%
11	Concrete or mortar mixers - 11	98	0	0	0	0	10	20	120	D	100%	210	75%
12a	Construction winches (CE driven) - 12a	97	3	0	0	0	10	15	60	D	100%	26	75%
12b	Construction winches (electric) - 12b	92	3	0	5	0	10	15	60	D	100%	26	75%
13	Conveying/spraying machines, concr/mortar - 13	102	0	0	0	3	10	20	120	D	100%	52	75%
14	Conveyor belts - 14	111	3	0	0	0	10	20	240	D	100%	52	75%
15	Cooling equipment on vehicles - 15	93	0	5	0	0	12	25	720	E	100%	700	75%
16	Dozers (< 500 kW) - 16	107	3	0	0	3	10	20	240	D	100%	15	75%
17	Drill rigs - 17	106	3	0	0	3	8	15	200	D	100%	30	75%
18	Dumpers (< 500 kW) - 18	106	3	0	0	3	10	20	240	D	100%	30	75%
19	Equipment loading/unloading silos /tanks - 19	100	3	0	0	3	10	20	120	D	50%	105	75%
							10	20	120	F	50%		75%
20	Excavators, hydraulic / rope (< 500 kW) - 20	100	3	0	0	3	10	20	120	D	75%	726	75%
							10	20	120	F	25%	726	75%
21	Excavator-loaders (< 500 kW) - 21	101	3	0	0	3	10	20	240	D	100%	170	75%
22	Glass recycling containers - 22	99	0	0	5	6	12	30	60	E	75%	1000	75%
							12	25	60	C	25%		75%
23	Graders (< 500 kW) - 23	107	3	0	0	3	10	15	240	D	100%	5	75%
24	Grass trimmers/grass edge trimmers - 24	108	0	0	5	6	5	1	60	B	100%	18150	75%
25	Hedge trimmers - 25	104	3	0	0	6	5	1	60	A	100%	20000	75%
26	High pressure flushers - 26	106	3	0	0	3	10	10	60	C	100%	53	75%
27	High pressure water jet machines - 27	95	0	0	0	6	3	2	60	D	75%	1000	75%
							3	2	60	A	25%		75%
28	Hydraulic hammers - 28	122	3	0	5	6	10	20	26	D	100%	420	75%
29	Hydraulic power packs - 29	97	0	0	0	0	10	20	120	D	100%	105	75%
30	Joint cutters - 30	109	3	0	5	3	10	20	120	D	75%	53	75%
							10	20	120	F	25%		75%
31	Landfill compactors, loader+bucket (<500 kW) - 31	111	3	0	0	3	10	20	240	F	100%	5	75%
32	Lawnmowers (excl agricul/forestry equip) - 32	97	0	0	5	6	8	2	60	A	75%	66000	75%
32	Lawnmowers (excl agricul/forestry equip) - 32	97	0	0	5	6	8	20	60	B	25%	66000	75%
33	Lawn trimmers lawn edge trimmers - 33	95	0	0	5	6	5	1	60	A	100%	18150	75%
34	Leaf blowers - 34	102	0	0	5	6	5	1	60	A	50%	5000	75%
							5	1	60	B	50%		75%
35	Leaf collectors - 35	105	0	0	5	6	5	1	60	A	50%	5000	75%
							5	1	60	B	50%		75%
36a	Lift trucks, CE (rough terrain/construction) - 36a	103	0	0	0	6	10	20	240	D	100%	236	75%
36b	Lift trucks, CE (others excl. Cont. handling) - 36b	103	0	0	0	6	10	20	240	D	100%	840	75%
37	Loaders (< 500 kW) - 37	103	3	0	0	3	10	20	240	D	100%	342	75%
38	Mobile cranes - 38	105	0	0	0	3	10	20	60	D	100%	105	75%
39	Mobile waste containers - 39	95	0	0	5	6	12	5	2	C	90%	100000	75%
							12	30	60	E	10%		75%
40	Motor hoes (< 3 kW) - 40	93	3	0	0	3	6	5	120	F	100%	1050	75%
41a	Paver-finishers (high-compaction screed) - 41a	107	0	0	0	0	10	15	360	D	50%	11	75%
							10	15	360	F	50%		75%
41b	Paver-finishers (others) - 41b	107	0	0	0	0	10	15	360	D	50%	11	75%
							10	15	360	F	50%		75%
42	Piling equipment - 42	130	3	0	5	6	10	20	60	D	100%	3	75%
43	Pipelayers - 43	108	3	0	0	3	10	20	60	D	50%	10	75%
							10	20	60	F	50%		75%
44	Piste caterpillars - 44	109	3	5	0	6	5	30	240	F	100%	5	75%
45a	Power generators (< 400 kW) - 45a	93	0	0	0	0	10	30	480	D	100%	3000	75%
45b	Power generators (>_ 400 kw) - 45b	100	0	0	0	0	10	30	480	D	100%	150	75%
46	Power sweepers - 46	98	3	5	0	0	12	20	240	C	100%	32	75%
47	Refuse collection vehicles - 47	102	0	5	0	6	12	20	360	C	100%	105	75%
48	Road milling machines - 48	109	3	0	0	3	10	15	240	D	50%	5	75%
							10	15	240	F	50%		75%
49	Scarifiers - 49	98	3	0	5	6	4	10	60	B	75%	2730	75%
							4	1	60	A	25%		75%
50	Shredders chippers - 50	107	0	0	5	6	4	10	120	B	75%	1440	75%
							4	1	120	A	25%		75%
51	Snow-removing machines, rotating tools - 51	104	3	0	0	3	4	5	120	C	50%	11	75%
							4	5	120	F	50%		75%
52	Suction vehicles - 52	106	3	0	5	3	10	10	60	C	100%	34	75%
53	Tower cranes - 53	96	0	0	0	3	10	20	60	D	100%	21	75%
54	Trenchers - 54	107	3	0	0	3	10	20	120	D	50%	21	75%
							10	20	120	F	50%		75%
55	Truck mixers - 55	112	0	0	0	3	12	20	20	D	100%	48	75%
56	Water pump (not for under water) - 56	106	0	5	0	0	4	5	240	D	50%	1050	75%
							4	5	240	F	50%		75%
57	Welding generators - 57	93	0	0	0	0	10	20	360	D	100%	1050	75%

2.3 Data limitations

There are a number of limitations with the data that were available or could be collected during the study.

Noise emission data - baseline

At the time the OND came into force, little information was available on noise emissions of the covered equipment and the state of the art of it. The noise limits introduced with the OND aimed at eliminating the noisiest equipment on the market (estimated at about 30%). Existing legislation, the previous product specific Directives (see sections 2.1 and 5.5 of the Evaluation Study), and the 2005 amendment provide a baseline for equipment covered[13].For the remaining equipment without limits (Article 13), an average reduction of 1 dB due to technical progress and some market demand is estimated. For some equipment with higher demand for quieter products, more progress has been made than others, although it may not apply to the whole fleet.

Number of companies and equipment fleet data

Estimating the number of EU manufacturing companies in the market is particularly complex. No official data are available and NACE codes used by Eurostat statistics are too broad to provide a precise picture.

Similarly, equipment fleet data could not be assessed using available statistics as the code system used (Prodcom) covers broad categories which, in most cases, do not match with specific equipment.

A combination of desk research, data from the EC Noise database and expert opinion was used to produce an estimate which was then validated by sector organisations.

Data on non-compliant equipment on the market

No data was found on the existence of non-compliant equipment on the market. Also, stakeholder views on the matter are patchy and mostly rely on anecdotal knowledge. Studies that assessed the compliance with other Directives and requirements (e.g. NOMAD project[14]) were used to provide an indication of the potential scope of the issue.

Consumer participation

Consumer participation in the study has been low. Few consumer associations are actively engaged on this specific topic which indicates that other issues are higher on their agenda. This is a finding per se, although it made it difficult to capture the views of consumers on the issue of outdoor noise.

[13] Compressors; Concrete Breakers; Construction Plant Equipment; Hydraulic Excavators; Lawnmowers; Power Generators; Tower Cranes; Welding Generators; Dumpers, graders, loader-type landfill compactors, combustion-engine driven counterbalanced lift trucks, mobile cranes, compaction machines (non-vibrating rollers), paver-finishers, hydraulic power packs. Tracked dozers, tracked loaders, tracked excavator-loaders. Compaction machines (vibrating rollers, vibratory plates, vibratory rammers). Excavators, builders' hoists for the transport of goods, construction winches, motor hoes.

[14] NOMAD Steering Committee (2012). Report on the 'NOMAD' project – A survey of instructions supplied with machinery with respect to noise and the requirements of the Machinery Directive. Available at: http://www.hse.gov.uk/noise/nomad-report.pdf;
Pelkmans, J., Correia de Brito, A., Griner, A. and Luchetta, G. (2014) study on the merger of the Directive on Noise from Outdoor Equipment, 2000/14/EC, with the Machinery Directive, 2006/42/EC (including an evaluation of Directive 2000/14/EC) - final report. Available at: https://ec.europa.eu/docsroom/documents/4985/attachments/1/translations/en/renditions/pdf.

ANNEX III: NOTIFIED BODIES AND MARKET SURVEILLANCE AUTHORITIES

Table 6: List of Notified Bodies

Body No.	Name	Country
NB 0408	TÜV AUSTRIA SERVICES GMBH	Austria
NB 0511	ALLGEMEINE UNFALLVERSICHERUNGSANSTALT - SICHERHEITSTECHNISCHE PRÜFSTELLE	Austria
NB 0026	VINÇOTTE sa/nv	Belgium
NB 1639	SGS Belgium NV	Belgium
NB 1871	CENTER FOR TESTING AND EUROPEAN CERTIFICATION Ltd.	Bulgaria
NB 2494	KONČAR-Institut za elektrotehniku d.d.	Croatia
NB 1014	ELEKTROTECHNICKÝ ZKUŠEBNÍ ÚSTAV, s.p.	Czech Republic
NB 1015	STROJIRENSKY ZKUSEBNI USTAV s.p.	Czech Republic
NB 1016	STATNI ZKUSEBNA ZEMEDELSKYCH POTRAVINARSKYCH A LESNICKYCH STROJU, AKCIOVA	Czech Republic
NB 1017	TÜV SÜD Czech s. r. o.	Czech Republic
NB 1020	TECHNICKY A ZKUSEBNI USTAV STAVEBNI PRAHA s.p.	Czech Republic
NB 0199	DELTA DANSK ELEKTRONIK LYS OG AKUSTIK	Denmark
NB 1585	AKUSTIKNET A/S	Denmark
NB 0504	NATURAL RESOURCES INSTITUTE FINLAND (Luke), MEASUREMENT AND STANDARDIZATION (Vakola)	Finland
NB 0071	Laboratoire National de métrologie et d'Essais (LNE)	France
NB 0388	IRSTEA	France
NB 0526	Centre technique des industries mécaniques (CETIM)	France
NB 0036	TÜV SÜD Industrie Service GmbH	Germany
NB 0044	TÜV NORD CERT GmbH	Germany
NB 0197	TÜV Rheinland LGA Products GmbH	Germany
NB 0363	Deutsche Prüf- und Zertifizierungsstelle für Land- und Forsttechnik	Germany
NB 0366	VDE - Prüf- und Zertifizierungsinstitut GmbH	Germany
NB 0494	SLG PRÜF UND ZERTIFIZIERUNGS GMBH	Germany
NB 0515	DGUV Test Prüf- und Zertifizierungsstelle Fachbereich Bauwesen der Deutschen Gesetzlichen	Germany

Body No.	Name	Country
	Unfallversicherung e.V. (DGUV)	
NB 1008	TÜV Rheinland InterCert Muszaki Felügyeleti és Tanúsító Korlátolt Felelosségu Társaság	Hungary
NB 0066	ISTITUTO DI CERTIFICAZIONE EUROPEA PRODOTTI INDUSTRIALI S.P.A.	Italy
NB 0303	ICE Istituto Certificazione Europea S.p.A.	Italy
NB 0426	ITALCERT SRL	Italy
NB 0477	Eurofins Product Testing Italy S.r.l.	Italy
NB 0714	ECO - European Certifying Organization S.p.A.	Italy
NB 0865	ISTITUTO SERVIZI EUROPEI TECNOLOGICI SRL	Italy
NB 1092	ECO TECH ENGINEERING E SERVIZI AMBIENTALI S.r.l.	Italy
NB 1282	ENTE CERTIFICAZIONE MACCHINE SRL	Italy
NB 1878	VERICERT SRL	Italy
NB 0499	SOCIETE NATIONALE DE CERTIFICATION ET D'HOMOLOGATION S.À.R.L. (SNCH)	Luxembourg
NB 0399	ABOMA B.V.	Netherlands
NB 1433	URZAD DOZORU TECHNICZNEGO	Poland
NB 1437	CENTRALNY INSTYTUT OCHRONY PRACY - PANSTWOWY INSTYTUT BADAWCZY (CIOP-PIB)	Poland
NB 1451	INSTYTUT TECHNOLOGII ELEKTRONOWEJ ODDZIAŁ PREDOM	Poland
NB 1454	INSTYTUT MECHANIZACJI BUDOWNICTWA I GORNICTWA SKALNEGO	Poland
NB 1455	INSTYTUT ZAAWANSOWANYCH TECHNOLOGII WYTWARZANIA	Poland
NB 1459	INSTYTUT TECHNOLOGICZNO-PRZYRODNICZY	Poland
NB 1461	OSRODEK BADAN, ATESTACJI I CERTYFIKACJI OBAC SP. Z.O.O.	Poland
NB 1804	Institutul National de Cercetare-Dezvoltare pentru Masini si Instalatii destinate Agriculturii si Industriei Alimentare	Romania
NB 1299	Technicky skusobny ustav Piestany s.p.	Slovakia
NB 1300	Narodne polnohospodarske a potravinarske centrum - Technicky a skusobny ustav podohospodarsky, Rovinka	Slovakia
NB 1304	SLOVENIAN INSTITUTE OF QUALITY AND METROLOGY - SIQ	Slovenia
NB 0404	SMP - SVENSK MASKINPROVNING AB	Sweden

Body No.	Name	Country
NB 0038	Lloyd's Register Verification Limited	United Kingdom
NB 0359	INTERTEK TESTING; CERTIFICATION LTD	United Kingdom
NB 0888	Horiba MIRA Limited	United Kingdom
NB 0891	Element Materials Technology Warwick Ltd	United Kingdom
NB 1067	AV TECHNOLOGY LTD	United Kingdom
NB 1088	Sound Research Laboratories (a trading name of SRL Technical Services Ltd)	United Kingdom
NB 1942	CEM INTERNATIONAL LTD	United Kingdom
NB 1990	PROSE AG	Switzerland (MRA)
NB 1991	SCONRAIL AG	Switzerland (MRA/LTA)
NB 2251	DTC Dynamic Test Center AG	Switzerland (MRA)
NB 2195	Szutest Uygunluk Değerlendirme A.Ş.	Turkey

Table 7: List of Market Surveillance Authorities

Country	Name and Address	Contact
Austria	Federal Ministry of Science, Research and Economy - Division I/5 Stubenring 1, 1011 Vienna	Tel: +43 1 711 00 5827 e-mail: post@I5.bmwfj.gv.at
Belgium	Federal Public Service Health, Food, Safety Chain and Environment Directorate General Environment Place Victor Horta 40, bte 10, 2C36/18 1060 Brussels	Tel: +32 2 524 95 59 Fax: +32 2 524 96 36 e-mail: info_environment@health.fgov.be
Bulgaria	State Agency for Metrological and Technical Surveillance (SAMTS) Directorate General Market Surveillance 52A, G.M. Dimitrov Blvd. 1797 Sofia	Tel: +359 2 980 92 96 / 892 97 77 Fax: +359 2 988 32 32 E-mail: damtn@damtn.government.bg
Croatia	Ministry of Health Directorate for Sanitary Inspection Ksaver 200a 10000 Zagreb	Tel: +385 1 4607555 Fax: +385 1 4677076
Cyprus	Ministry of Labour, Welfare and Social Insurance Department of Labour Inspection 12 Apellis Street 1080 Nicosia	Tel: +357 22405623 Fax: +357 22663788 E-mail: info@dli.mlsi.gov.cy
	Ministry of Labour, Welfare and Social Insurance Department of Labour Inspection 1493 Nicosia	Tel: +357 22 40 56 10 Fax: +357 22 66 37 88
Czech Republic	Czech Trade Inspection Štěpánská 567/15 Praha 2	E-mail: info@coi.cz
Denmark	Danish Environmental Protection Agency Antvorskov Alle 139c DK-4200 Slagelse	Tel: +45 7254 4000 E-mail: kemikalieinspektionen@mst.dk
Estonia	Technical Surveillance Authority Industrial Safety Division Sõle str. 23A 10614 Tallinn	Tel: +372 667 2000 / 2175 Fax: +372 667 2001 E-mail: info@tja.ee
Finland	Regional State Administrative Agency of Northern Finland Occupational Health and Safety Area of Responsibility (Equipment intended for professional use) P.O. Box 229 90101 Oulu	Tel: +358 295 017 500 E-mail: tyosuojelu.pohjoinen@avi.fi
	Regional State Administrative Agency of Eastern Finland	Tel: +358 295 016 800 E-mail: tyosuojelu.ita@avi.fi

Country	Name and Address	Contact
	Occupational Health and Safety Area of Responsibility (Equipment intended for professional use) P.O. Box 1741 70101 Kuopio	
	Regional State Administrative Agency of Western and Inland Finland Occupational Health and Safety Area of Responsibility (Equipment intended for professional use) P.O. Box 272 33101 Tampere	Tel: +358 295 018 450 E-mail: tyosuojelu.lansi@avi.fi
	Regional State Administrative Agency of Southern Finland Occupational Health and Safety Area of Responsibility (Equipment intended for professional use) P.O. Box 110 00521 Helsinki	Tel: +358 295 016 000 E-mail: tyosuojelu.etela@avi.fi
	Finnish Safety and Chemicals Agency (Tukes) (Equipment intended for consumer use) Opanstinsilta 12B P.O. Box 66 00521 Helsinki	Tel: +358 295 052 000
	Ministry of Social Affairs and Health (Equipment intended for professional use) P.O. Box 33 (Meritullinkatu 8) 00023 Government	Tel: +358 295 16001 E-mail: kirjaamo@stm.fi
	Regional State Administrative Agency of South-western Finland Occupational Health and Safety Area of Responsibility (Equipment intended for professional use) P.O. Box 22 20801 Turku	Tel: +358 295 018 000 E-mail: kirjaamo.lounais@avi.fi
France	Ministère de la transition écologique et solidaire 246, boulevard Saint-Germain 75007 Paris	Tel: +33 1 40 81 21 22
	Direction Générale des douanes et droits indirects	Tel: 0811 204444 / +33 1 72407850 E-mail: ids@douane.finances.gouv.fr
Germany	Ministerium für Arbeit, Integration und Soziales des Landes Nordrhein-Westfalen Referat III 4 Fürstenwall 25 40219 Düsseldorf	Tel: +49 211 855 5 Fax: +49 211 855 3211 E-mail: poststelle@mais.nrw.de

Country	Name and Address	Contact
	Niedersächsisches Ministerium für Soziales, Gesundheit und Gleichstellung Referat 403 Hannah-Arendt-Platz 2 30159 Hannover	Tel: +49 511 120 0 Fax: +49 511 120 4298 E-mail: poststelle@ms.niedersachsen.de
	Ministerium für Arbeit, Gleichstellung und Soziales Mecklenburg-Vorpommern Werderstraße 124 19055 Schwerin	Tel: +49 385 588 0 Fax: +49 385 588 9099 E-mail: poststelle@sm.mv-regierung.de
	Ministerium für Umwelt, Klima und Energiewirtschaft, Baden-Württemberg Referat 43 – Chemikalien- und Produktsicherheit, Marktüberwachung Kernerplatz 9 70182 Stuttgart	Tel: +49 711 126 0 Fax: +49 711 126 2881 E-mail: poststelle@um.bwl.de
	Hessisches Ministerium für Soziales und Integration Referat III 4B – Geräte- und Produktsicherheit Dostojewskistr. 4 65187 Wiesbaden	Tel: +49 611 817 0 Fax: +49 611 809399 E-mail: poststelle@hsm.hessen.de
	Freie und Hansestadt Hamburg Behörde für Gesundheit und Verbraucherschutz Billstraße 80 20539 Hamburg	Tel: +49 40 428 370 Fax: +49 40 428 372421 E-mail: gesundheitverbraucherschutz@bgv.hamburg.de
	Freie Hansestadt Bremen Der Senator für Gesundheit Referat 45 - Arbeitsschutz, Technischer Verbraucherschutz, Eichwesen Bahnhofsplatz 29 28195 Bremen	Tel: +49 421 361 0 Fax: +49 421 361 15929 E-mail: arbeitsschutz@gesundheit.bremen.de
	Ministerium für Umwelt, Landwirtschaft, Ernährung, Weinbau und Forsten, Rheinland-Pfalz Referat 67 Kaiser-Friedrich-Straße 1 55116 Mainz	Tel: +49 6131 16 4611 Fax: +49 6131 1617 4611 E-mail: gewerbeaufsicht@mulewf.rlp.de
	Bayerisches Staatsministerium für Umwelt und Verbraucherschutz Referat 35 Rosenkavalierplatz 2 81925 München	Tel: +49 89 9214 00 Fax: +49 89 9214 2266 E-mail: poststelle@stmuv.bayern.de
	Ministerium für Arbeit, Soziales, Gesundheit, Frauen und Familie,	Tel: +49 331 866 0 Fax: +49 331 866 5108

Country	Name and Address	Contact
	Brandenburg Referat 36 Heinrich-Mann-Allee 103 14773 Potsdam	E-mail: poststelle@masgf.brandenburg.de
	Sächsisches Staatsministerium für Wirtschaft, Arbeit und Verkehr Referat 26 - Produktsicherheit, Technischer Verbraucherschutz, Sozialer Arbeitsschutz Wilhelm-Buck-Straße 2 01097 Dresden	Tel: +49 351 564 0 Fax: +49 351 564 8068 E-mail: poststelle@smwa.sachsen.de
	Ministerium für Arbeit und Soziales des Landes Sachsen-Anhalt Referat 32 - Technischer und stoffbezogener Arbeitsschutz Turmschanzenstraße 25 39114 Magdeburg	Tel: +49 391 567 4510 Fax: +49 391 567 6937 E-mail: arbeitsschutz@ms.sachsen-anhalt.de
	Ministerium für Wirtschaft, Arbeit, Verkehr und Technologie des Landes Schleswig-Holstein Düsternbrooker Weg 94 24105 Kiel	Tel: +49 431 988 0 Fax: +49 431 988 7239 E-mail: poststelle@wimi.landsh.de
	Ministerium für Soziales, Gesundheit, Familie und Gleichstellung des Landes Schleswig-Holstein Referat Arbeitsschutz, Arbeitsmedizin, Prävention in der Arbeitswelt Adolf-Westphal-Str. 4 24143 Kiel	Tel: +49 431 988 0 Fax: +49 431 988 7239 E-mail: poststelle@sozmi.landsh.de
	Thüringer Ministerium für Arbeit, Soziales, Gesundheit, Frauen und Familie Referat 54 - Arbeitsschutz Werner-Seelenbinder-Str. 6 99096 Erfurt	Tel: +49 361 37 900 Fax: +49 361 37 98800 E-mail: poststelle@tmasgff.thueringen.de
	Ministerium für Umwelt und Verbraucherschutz des Saarlandes Keplerstraße 18 66117 Saarbrücken	Tel: +49 681 501 00 Fax: +49 681 501 2089 E-mail: poststelle@umwelt.saarland.de
Greece	Ministry for the Environment, Physical Planning & Public Works	
Hungary	Hungarian Authority for Consumer Protection (HACP) József krt. 6 1088 Budapest	Tel: +36 1 459 4800 Fax: +36 1 210 4677 E-mail: nfh@nfh.hu
	Hungarian Trade Licensing Office (HTLO) (Industrial and commercial products) 37–39 Németvölgyi street	Tel: +36-1-458-5800 Fax: +36-1-458-5865 E-mail: mkeh@mkeh.gov.hu

Country	Name and Address	Contact
	H-1124 Budapest	
Ireland	Competition and Consumer Policy Section Department of Jobs, Enterprise & Innovation (No Market Surveillance Authority) Earlsfort Centre Dublin 2	Tel: +353 1 631 2625 E-mail: conspol@djei.ie
Italy	Ministry of Environment and Land Protection Institute Environmental Protection and Research - ISPRA Via Vitaliano Brancati, 48 00100 Roma	Tel: +39 06 50071 Fax: + 39 06 50072916
Latvia	Consumer Rights Protection Centre Brivibas street 55 Riga, LV-1010	Tel: +371 67388624 Fax: +371 67388634 E-mail: ptac@ptac.gov.lv
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ANNEX IV: REFERENCES

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