PETITION ON WIND TURBINE NOISE

FOR THE INTRODUCTION OF LEGISLATION REGARDING THE EVALUATION AND THE MINIMISATION OF WIND TURBINE NOISE

addressed to the European Parliament

summary

Assess and reduce acoustic disturbances of wind turbines

The present petition requests the European Parliament to seek the adoption of provisions to evaluate and reduce noise emissions from wind turbines, as well as to ensure the monitoring of wind turbines on the basis of appropriate terms of reference.

Noise emissions from wind turbines include *infrasounds* and *audible sounds* which affect countless citizens throughout the Union, in particular in their place of living.

Despite several Union legislations regarding the reduction of noise emissions, machines and outdoor equipment, it is common ground that the Union rules do not cover specifically the acoustic impact of wind turbines on citizens, notably by not explicitly identifying wind turbines as a source of noise emissions, contrary to other industrial sources of noise emissions. This is of special importance as wind turbines emit specific signatures of infrasound that pose a severe health risk to neighbouring citizens.

It is this legal gap that should remedied in order to protect the health and quality of life of Union citizens.

The present petition on wind turbine noise is submitted jointly by Associations from Belgium, France and Germany: Vent de Raison/WindmetRedelijkheid, Fédération environnement durable, Vent de Colère! and Bundesinitiative Vernunftkraft.

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The present petition is addressed to the European Parliament on the basis of Article 44 of the Charter of fundamental rights of the European Union, of Article 20, 24 and 227 of the Treaty on the functioning of the European Union and of Article 226 to 229 of the Internal regulation of the European Parliament.

I – IMPACT OF WIND TURBINES

In physical terms, acoustic emissions[1] are a mechanic vibration propagating through an elastic medium with a certain frequency. The frequency of a given acoustic emission is calculated in hertz (Hz), i.e. in numbers of cycle per second.

On the one hand, sound waves with a frequency below 20 Hz are called *infrasounds* which are not heard by the human ear but are felt by the human body and organs.

On the other hand, sound waves with a frequency between 20 Hz and 20 **k**Hz are considered as *audible sounds* and are normally heard by the human ear.[2]

Wind turbines emit a wide range of *infrasounds* (not heard) and *audible sounds*. The nature of *infrasounds* makes their natural containment more difficult.

In concrete terms, the acoustic emissions from wind turbines include, in addition to that of the machinery located at the top of the mast, also the pressure waves emitted by each blade when rotating as well as by the passage of each blade before the mast.

A technical presentation summarizes the noise emissions of wind turbines is attached as an annex to the present petition.

Noise emissions of wind turbines are affecting citizens throughout the Union.

At the time of the adoption of directives 2002/49 and 96/61, wind turbines were not part of the Union industrial landscape. This is no longer the case today.

Noise emissions and low frequencies of wind turbines and resulting sanitary risks are recognized by public health authorities :

- In Belgium (Publication No. 878 Conseil supérieur de santé public du 3 avril 2013),

- In France
  1) ANSES report of 30 March 2017 :

The scientific committee of ANSES ("*Agence nationale de sécurité sanitaire, de l'alimentation, de l'environnement et du travail*") « *recommends in terms of low frequency noise and infrasounds :*

[1] "*acoustic emissions*" is used interchangeably with "*noise*" though the first expression is more accurate.
[2] Sound waves with a frequency beyond 20 kHz are considered as *ultrasounds*; which, as *infrasounds*, are not heard by the human ear.

- *to check the existence or not of a possible mechanism of modulation of the perception of audible sound by infrasounds of comparable levels to those measured at nearby residents;*
- *to study the impact of the modulation of the scope of the acoustic signal on the perceived discomfort resulting from noise;*
- *to study the hypothesis of mechanisms of cochlea-vestibular effects that may be the source of physiopathological effects;*
- *to conduct a study among the nearby residents of wind turbine parks which would allow the identification of objective evidence of a physiological effect.* »[3]

The above findings should be further updated with medical and scientific data identifying the damaging effects of infrasounds on body organs including heart tissues and the subconscious perception of infrasounds which leads to the activation of defined areas of the human brain.

2) opinion of the Academy of medicine of 9 May 2017 https://www.academie-medecine.fr/nuisances-sanitaires-des-eoliennes-terrestres/) which also refers to various other scientific references.[4]

This opinion specifies that not only sound or low frequency acoustic emissions (between 100 and 20 Hz) and infrasounds (below 20 Hz) (which constitute the main signature of harmful noise from wind turbines) but noise emitted as a whole:

"[o]*nshore wind power through its noise and visual nuisance affects the quality of life of some of the residents and therefore their "state of complete physical, mental and social well-being" which defines the concept of health today. In the twofold concern of improving acceptance of the wind power factor and reducing its health impact, direct or indirect, on a section of the local population, the working group recommends:*
(…)
-to systematize the acoustic compliance checks, the frequency of which must be specified in all authorization orders and not on a case-by-case basis,
-encourage technological innovations likely to restrict and "curb" in real time the noise emitted by wind turbines in order to mitigate the effects felt ...
(…)

[3] Informal translation

[4] https://docs.wind-watch.org/BruceMcPhersonInfrasoundandLowFrequencyNoiseStudy.pdf

https://pubmed.ncbi.nlm.nih.gov/23257581/

https://www.sciencedirect.com/science/article/abs/pii/S001393511630144X

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3653669/#:~:text=Pierpont%20a%20document%C3%A9%20les%20sympt%C3%B4mes,l'irritabilit%C3%A9%2C%20des%20probl%C3%A8mes%20de

https://ontario-wind-resistance.org/2012/03/11/wind-turbine-noise-seems-to-affect-health-adversely-and-an-independent-review-of-evidence-is-needed/#:~:text=Previous%20Next%20%E2%86%92-,Wind%20turbine%20noise%3A%20Seems%20to%20affect%20health%20adversely%20and%20an,review%20of%20evidence%20is%20needed&text=A%20large%20body%20of%20evidence,jurisdictions%2C%20including%20the%20United%20Kingdom.

https://www.noiseandhealth.org/article.asp?issn=1463-1741;year=2012;volume=14;issue=60;spage=237;epage=243;aulast=Nissenbaum#google_vignette

-to undertake, as recommended in the previous report, a prospective epidemiological study on health pollution." [5] (pages 1-2)

The opinion of the French Academy of medicine adds that the wind turbine syndrome may also be linked to " [i]*nter-individual differences in hearing sensitivity which can reach up to 15 dB as well as by the existence of an auditory pathology such as hyperacusis or presbyacusis at the origin of a recruitment (that is to say a pinching hearing comfort field).*" [6] (page 11).

The reference to individual sensitivies should not lead to the hasty conclusion that these disturbances from audible sounds and infrasounds do not exist.

- In Germany, physicians estimated from their field studies that a minimum of 200 000 citizens in the neighbourhood of wind turbines suffer from severe health affections.[7]

The scope of the impact and the number of persons affected are attested by numerous testimonies. As can be expected, most disturbances are taking place at the private residence of the persons affected, including severe loss of sleep quality and multiple stress reactions as well as anxiety and cardiac insufficiencies.

The Parliament has already received petitions regarding wind turbine noise in specific locations notably from Germany (1211/2016 and 1591/2013), from Belgium (2759/2013), from France (0584/2015) and from Sweden (2386/2013).

According to publicly available data, onshore wind turbines went from a capacity of less than 10 GW at the end of the 1990s to about 200 GW in 2020.[8]

This means that there are currently over 100 000 wind turbines on the territory of the European Union and that several thousand additional wind turbines are being set up each year. This trend forecasts about 200 000 wind turbines by 2030 and 300 000 wind turbines by 2050.

Furthermore the increase of the generation capacity of individual wind turbines went from about 0,5 MW-1 MW per turbine in the 1990s to 2,5 MW to 6 MW per turbine currently. As result of this trend towards higher capacity, the size of the turbines has increased and thus the level of acoustic emissions is many times higher.

Members of the Parliament have on multiple occasions submitted questions to the European Commission on these issues.

As early as 2009, a question was submitted to the European Commission in the following terms:

"[a]*ccording to pressure groups and researchers from the Aalborg University Acoustics Research Department, cogeneration plants with inadequate sound insulation and vibration*

[5] Informal translation
[6] Informal translation
[7] Kaula, S. (2019): Untersuchung zu gesundheitlichen Beeinträchtigungen von Anwohnern durch den Betrieb von Windenergieanlagen in Deutschland anhand von Falldokumentationen. https://dsgs.info/.cm4all/mediadb/Aktuelles/DSGS%20e.V.%20Studie.pdf
[8] https://en.wikipedia.org/wiki/Wind_power_in_the_European_Union

absorption cause 'noise pollution', since the low-frequency wavelength means that the sound can travel very long distances — in the case of cogeneration plants as much as 30 km.

Low-frequency noise is sound at a frequency that only a certain percentage of people can hear. The organisation which drew our attention to this matter refers to a study carried out at the Technical University of Denmark (DTU) showing that 3-5 % of the population perceive low-frequency noise up to 5 times more powerfully than others. Since the total population of the EU is some 500 million, this means that between 15 and 20 million EU citizens have this hearing condition. In Denmark the medical profession has not been informed about this study, and so many people who have this hearing condition have been misdiagnosed as having tinnitus. The situation is likely to be the same in other EU countries.

The organisation in question has unsuccessfully lobbied the Danish Environment Ministry to have the noise limit reduced by 10 db. At present the limit for low-frequency noise is 20 db indoors at night in residential buildings, a little more in daytime and again a little more in non-residential buildings. One other problem has been that it is difficult to measure low-frequency noise accurately and thus detect its presence.

People living near a cogeneration plant which is not properly sound-insulated, or a wind turbine, are disturbed by the noise 24 hours a day, described as a 'deep rumbling noise from outside' or 'a lorry engine idling' which prevents them from sleeping in their own houses. No earplugs can keep the noise out.

The term 'low-frequency noise' should not be confused with the related term 'infra-sound'.

What does the Commission propose to do about this widespread problem? Could the solution be to introduce a minimum harmonised level for low-frequency noise? " [9]

In response to this question, the Commission confirms, on the one hand, that it is "*aware of the issue and the effects on the physical and psychological health of citizens in the EU*" and, on the other hand, that it "*will assess the results of these research activities and will consider to what extent these results can be integrated into the forthcoming review of Directive 2002/49/EC relating to the assessment and management of environmental noise which is due to be completed in 2011*". [10]

The petitioners have no knowledge of the evaluation referred to by the Commission.

More recently, the Commission maintains, not without contradiction, that " [s]*o far, there has been no scientific evidence of lasting impacts, but there is recognition of public perception of impacts and nuisance. Based on an ongoing review of the WHO (World Health Organisation) on the influence of wind turbines noise, the Commission will consider if further action is necessary, taken full account of subsidiarity.*

In addition, the Commission has funded a large coordination action(1) in the Seventh Framework Programme for Research, Technological Development, which reviewed scientific evidence available on potential human health effects of noise in general.

9 Question (P-4845/09) of 6 October 2009
10 Response of 3 November 2009 to question (P-4845/09)

In addition, several studies have been performed at national level on the impact of wind turbines on human health. It was concluded that further studies are warranted on better understanding of health effects.

Noise pollution is also recognised by the wind power industry, and it is taken into account in the design of new and advanced wind turbines and in ongoing and future research and innovation projects." [11]

The Commission has also indicated that it was following "*very closely the work of the World Health Organisation on understanding health effects of wind turbines, that resulted in recommendations for the competent authorities not to exceed 45dB Lden(3), and in that sense understands the concerns of citizens exposed above such values* [of sound levels]." [12]

During the same period, in a finding that includes the noise from wind turbine, the Parliament has noted that "*at least 10 000 premature deaths in the EU are caused by noise-related illnesses and that in 2012 approximately a quarter of the population of the EU was exposed to levels of noise in excess of the limit values; calls on the Member States to prioritise the monitoring of noise levels in line with Directive 2002/49/EC(13), so as to ensure that the applicable limit values for indoor and outdoor environments are respected* " (Resolution of 17 April 2018 on the implementation of the 7th Environment Action Programme, recital 26.)

It follows that existing studies have concluded to the influence of infrasound and sound signatures emitted by wind turbines on test persons and related such a signature to the health problems reported by residents around wind turbines. More adequate studies are yet to be performed.

The existence of wind turbines acoustic emissions, *infrasounds* and *audible sounds*, is uncontested and require legislative initiative.

II - DIRECTIVE 2002/49 ON THE ASSESSMENT AND THE MANAGEMENT OF NOISE

The European Parliament is long working on all aspects of the management and of the limitation of noise and of its effects on Union citizens.

The Parliament has notably adopted directive 2002/49 of the European Parliament and of the Council of 25 June 2002 relating to the assessment and management of environmental noise (consolidated version), (further the "Directive").

The Directive aims "*to define a common approach intended to avoid, prevent or reduce on a prioritised basis the harmful effects, including annoyance, due to exposure to environmental noise.* "

The Directive implements the following actions:

11 Response of 9 June 2017 to question 2451/2017
12 Response of 6 June 2019 to question 1408/2019

"(a) the determination of exposure to environmental noise, through noise mapping, by methods of assessment common to the Member States;

(b) ensuring that information on environmental noise and its effects is made available to the public;

(c) adoption of action plans by the Member States, based upon noise-mapping results, with a view to preventing and reducing environmental noise where necessary and particularly where exposure levels can induce harmful effects on human health and to preserving environmental noise quality where it is good." (Article 1)

The Directive applies « *to environmental noise to which humans are exposed in particular in built-up areas, in public parks or other quiet areas in an agglomeration, in quiet areas in open country, near schools, hospitals and other noise-sensitive buildings and areas* » (Article 2).

However, the Directive does « *not apply to noise that is caused by the exposed person himself, noise from domestic activities, noise created by neighbours, noise at work places or noise inside means of transport or due to military activities in military areas*» (article 2 2.). These exceptions, limitatively listed, do not include or concern noise emissions from wind turbines.

The Directive has also introduced several relevant definitions regarding in particular:
« *«environmental noise» shall mean unwanted or harmful outdoor sound created by human activities, including noise emitted by means of transport, road traffic, rail traffic, air traffic, and from sites of industrial activity such as those defined in Annex I to Council Directive 96/61/EC of 24 September 1996 concerning integrated pollution prevention and control* » ;[13]

«*"harmful effects" shall mean negative effects on human health* »*;*

«*"annoyance" shall mean the degree of community noise annoyance as determined by means of field surveys* »*;*

«*"noise indicator" shall mean a physical scale for the description of environmental noise, which has a relationship with a harmful effect* »*;*

«*"assessment" shall mean any method used to calculate, predict, estimate or measure the value of a noise indicator or the related harmful effects* »*;*

« *"dose-effect relation" shall mean the relationship between the value of a noise indicator and a harmful effect* »*;*

« *"acoustical planning" shall mean controlling future noise by planned measures, such as land-use planning, systems engineering for traffic, traffic planning, abatement by sound-insulation measures and noise control of sources* »*;*

« *"the public" shall mean one or more natural or legal persons and, in accordance with national legislation or practice, their associations, organisations or groups* »*;*

« *"data repository" means an information system, managed by the European Environment Agency, containing environmental noise information and data made available through national data reporting and exchange nodes under the control of the Member States* ».
(Article 3 a) to e), j) and u) to w) of the Directive)

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13 Directive 96/61 was ultimately replaced by directive 2010/75 including its annex I covering « *Energy industries* » without expressly referring wind turbines. In any event, the reference « *such as* » is not limitative.

The Directive provides for, more particularly, the design of " *strategic noise maps* " regarding certain urban areas or infrastructures (major roads and railways as well as significant airports) and " *action plans designed to manage, within their territories, noise issues and effects, including noise reduction if necessary* " (Article 7 and 8).

Action plans « *shall be reviewed, and revised if necessary, when a major development occurs affecting the existing noise situation, and at least every five years after the date of the approval of those plans.*

The reviews and revisions, that in accordance with the first subparagraph would be due to take place in 2023, shall be postponed to take place no later than 18 July 2024. » (idem).

The Directive includes six annexes regarding, respectively, the following areas :
Annex I – Noise indicators
Annex II – Assessment methods for the noise indicators
Annex III – Assessment methods for harmful effects
Annex IV – Minimum requirements for strategic noise mapping
Annex V – Minimum requirements of action plans
Annex VI – Data to be sent to the Commission.

The Directive was subsequently amended on several occasions.[14]

On 19 May 2015, directive 2015/996 of the Commission has replaced Annex II of the Directive (common methods of noise assessment).

On 5 June 2019, regulation 2019/1010 of the European Parliament and of the Council introduced certain new provisions regarding notably a data repository managed by the European Agency for the Environment and regarding the updating and publicity by the Member States of action plans and strategic noise maps.

On the 4 March 2020, directive 2020/367 of the Commission replaced Annex III to the Directive (assessment methods of harmful effects of environmental noise).

The European Commission has made public the proposal of delegated directive aiming to modify Annex II of the Directive with a view to adapt the Directive to technological progress regarding the method of calculation of noise in the environment.

This last proposal of a delegated directive was subject to a public consultation from 5 August to 2nd September 2020 which received 54 contributions. Two thirds of the contributions submitted (33/54) concern directly or indirectly noise disturbance caused by wind turbines.

The Directive was subject to some infringement actions but its substantive provisions have not, to date, been interpreted by the Court of the justice.

14 Some of the amendments are not relevant to the present context. It is in particular the case of regulation 1137/2008 of the Parliament and of the Council and of regulation 2019/1243 of the Parliament and of the Council regarding implementation powers.

Directive 2002/49 is the existing legislative instrument applicable to noise management but does not currently address wind turbine infrasounds and audible sounds.

III – STANDARDS OF WIND TURBINE NOISE

Wind turbines are subject to directive 2006/42 on machinery and to CE marking rules but these rules apply at the stage of placing on the market of the turbines and do not address the noise emissions of installed wind turbines.

In that context, Technical Committee 88 – Wind Turbines of the CENELEC[15] (further "Technical Committee 88") developed technical specifications regarding the manufacture, the safety and the performance of wind turbines in the form of working documents, some of which cover the noise characteristics of wind turbines.

However, on the one hand, the work of Technical Committee 88 covers wind turbines and not completed wind turbine constructions, their operation or their impact on humans and on the environment.

On the other hand and in any event, the business plan of the Technical Committee 88 (from 2012) shows a significant contradiction between the assessment of the situation by the working group, composed essentially of industrial manufacturers economically dependent from the wind power industry, and sound and infrasound emissions experienced by persons exposed to wind turbines.

Indeed, the terms of reference of Technical Committee 88 state that "[t]*he impact on the environment is virtually limited to noise and visual intrusion – in the case of offshore, visual intrusion only (in some cases). Significant reduction in the level of noise emission has virtually eliminated noise as an issue. Numerous reports of majorities that support wind farm developments indicate that the obstacle of visual intrusion onshore is diminishing.* "

Contrary to the hopes expressed by the European Commission in its answers to parliamentary questions, it does not seem reasonable to expect the reduction of noise emissions from wind turbines as machinery if the Technical Committee 88, in charge of achieving such progress, considers, since 2012, that the issue is « *virtually eliminated* ».

Separately, turbines and wind turbine constructions are not expressly covered by directive 2000/14 of 8 May 2000 relating to the noise emission in the environment by equipment for use outdoors. Nevertheless, directive 2000/14 should logically also cover equipment such as wind turbines.

Finally, directive 2011/92 on the assessment of the effects of certain public and private projects on the environment, including wind turbines for the production of electricity (article 4 2. and Annex II 3. i)), provides for the evaluation of the impact on human health (article 3 1 a)).

However the requirement of such prior assessment, including the estimation and the taking into account of noise emissions, is not guaranteed in practice.

15 European Committee for Electrotechnical Standardization

Even when it is conducted, the impact assessment on health remains subject to the competent national authorities, and according to their own rules. Union law contains neither a harmonised assessment standard nor ceilings of noise profiles specific to wind turbines.

A recent ruling of the Court of justice illustrates this situation (judgment of 25 June 2020, *A. e.a. Gewestelijke stedenbouwkundige ambtenaar van het departement Ruimte Vlaanderen, afdeling Oost-Vlaanderen*, C-25/19). In its decision, the Court recalled that provisions regarding the projection of shadows and noise standards applicable to wind turbine constructions are subject to the requirement of a prior environmental assessment.

Similarly, Union law does not provide for a minimum distance of wind turbines to residential buildings, letting Member States determine such minimum distance on the basis of justifications, in particular regarding public health or environmental protection (case C-727/17).

The petitioners consider that it is neither satisfactory nor efficient to be compelled to engage, as the case may be, for each wind turbine site, legal proceedings that are long, costly and uncertain, absent provisions that are sufficiently precise.

Far from making progress towards the mitigation of wind turbine infrasounds and audible sounds, European standardization activities have ignored these issues.

IV – IMPLEMENTATION OF THE POLICY ON NOISE

The policy of the Union on noise management was addressed in several reports on the implementation of the Directive.

On 10 March 2004, a first report was prepared by the European Commission in which it was underlined that « *the Directive will provide a basis for developing Community measures to reduce the noise emitted by the major sources of environmental noise* ».

That report presented the measures adopted or considered to reduce noise emissions from road and rail vehicles and infrastructures and from aircrafts.

In that same report, the Commission also addressed, on the one hand, the noise from industrial activities and, on the other hand, the noise from outdoor machinery.

With regard to the noise of industrial activities, the Commission insisted on the necessity to observe the best available techniques with a view to reduce noise pollution while stating that « *that industrial noise is a local environmental issue, and the measures to be taken at a specific installation depend on its location* ».

With regard to outdoor equipment and tractors, the Commission noted that the adoption of directive 2000/14 (also addressed further below) « *lays down noise provisions on noise from 57 types of outdoor equipment, including the equipment already covered by existing legislation (which is repealed by the new Directive). It aims to smooth the functioning of the internal market and to improve the health and well-being of EU citizens by reducing the noise emitted by outdoor equipment. It sets out four types of action to achieve this: harmonisation of noise*

emission limits and standards, harmonisation of conformity assessment procedures, harmonisation of noise level marking, and compilation of data on noise emissions. »

The report added that the mandatory labelling of equipment covered by directive 2000/14 should include « *the guaranteed sound power level expressed in dB(A)* ».

The Commission concluded the report by indicating its intention « *to develop these measures in order to further improve the noise exposure situation in Europe, on the understanding that legislative proposals on sources of noise should be made on the basis of robust evidence supporting such proposals. This is in line with the 'knowledge based approach' for policy making as laid down in the Sixth Environment Action Programme.*

Therefore, as stated in the past and in accordance with the Treaty establishing the European Community, the Commission will regularly assess the need for making new legislative proposals on sources of noise and, where appropriate, make such proposals ».

On 1st June 2011, the Commission issued another report on the implementation of the Directive for the purpose of evaluating both the need for new actions to reduce the impact of noise emissions and the quality of the noise environment of the Union. The Commission noted in particular the significant impact of noise emissions on the health of the population.

The Commission underlined that « [e]*nvironmental noise is addressed at the EU level through a wide range of instruments including provisions on market access requirements for certain vehicles and equipment, railway interoperability specifications and rules on operating restrictions at airports* ». The Commission added that it was « *considering developing these measures further in order to reduce the noise exposure and pollution in the EU* ».

However, this report makes no mention of the possibility of provisions or action in relation to acoustic emissions from wind turbines, whereas the Commission had already confirmed that it knew the existence of the issue and had committed to examine that issue in the context of preparing that very report.[16]

The Commission also quotes a scientific report of CE Delft confirming, with regard the health consequences of noise from road transport, that Union legislation concerning the reduction of noise at the source constitutes the most cost-efficient mean to reduce the impact of noise emissions.

Apart from the Directive, the Union has also adopted specific rules on the reduction of noise at the source regarding in particular motor vehicles, two- or three-wheel vehicles and quadricycles as well as rolling stock.

A regulation of noise from the operation of airports was also introduced.

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16 See parliamentary question (P-6464/07) of 20 December 2007 asking « [w]*hat research and action*» the Commission had undertaken « *regarding wind farms with regards to the Environmental Noise Directive 2002/49/EC?*» and more particularly « *the level of noise acceptable under current directives that wind turbines can generate* » and the Commission response of 13 February 2008; as well as the question (P-4845/09) of 6 October 2009 (already quoted above).

First, directive 2002/30 of the European Parliament and of the Council of 26 March 2002 on the establishment of rules and procedures with regard to the introduction of noise-related operating restrictions at Community airports was introduced.

Directive 2002/30 notably provided the terms for the evaluation of noise disturbances caused by some airports as well as the possibility of proceed with the withdrawal of aircrafts emitting the highest level of noise and with restrictions to the operation of airport infrastructure.

Directive 2002/30 also included the concept of « *balanced approach* » defined as « *an approach under which Member States shall consider the available measures to address the noise problem at an airport in their territory, namely the foreseeable effect of a reduction of aircraft noise at source, land-use planning and management, noise abatement operational procedures and operating restrictions* » (article 2 g).

Regulation 598/2014 of the European Parliament and of the Council of 16 avril 2014 on the establishment of rules and procedures with regard to the introduction of noise-related operating restrictions at Union airports within a Balanced Approach then supplemented and replaced directive 2002/30.

On 30 March 2017, the Commission presented a new report on the implementation of the noise Directive (2002/49) reiterating that : « [n]*oise pollution continues to constitute a major environmental health problem in Europe* » and that « *there is a continuing need for a common approach to the management of noise. Moreover, collecting harmonised data on EU level is important to provide a high-quality evidence base for the further development of EU noise-at-source legislation, which is necessary since local noise management measures could be ineffective without additional controls over noise emitted by the major sources of noise* ».

The Commission concludes first of all that « [t]*he evaluation and implementation assessment of the Directive have demonstrated several areas where activities are needed to reduce noise impacting citizens' health in the Union, to better achieve the objectives of the Directive and thereby moving closer to WHO recommended values*.»

The Commission then recalls that « *EU noise-at-source legislation remains the most cost effective mean to address noise* ».

Finally, it is also noted that « [t]*he evaluation shows that measures to directly addressing noise have high initial cost and long periods to recover the financial investment. However, they are highly efficient when comparing their costs to the societal benefit* ».

It results from the successive evaluations since the adoption of the Directive that the policy of the Union regarding noise, on the one hand, allows to consider any new legislation aiming to evaluate and to manage existing noise disturbances, and, on the other hand, that Union legislation aiming to reduce noise at the source is the most cost-effective mean to remedy noise disturbances.

The experience of Directive 2002/49 and of sectoral noise regulation shows that Union legislation on noise management works and is the most cost-effective way to act. Union rules on noise management therefore need to be supplemented with regard to infrasound emissions and audible emissions of wind turbines.

V – DISCUSSION

(i) Dead-end of the legal void on wind turbines noise

The objective of Directive is to create a common framework regarding the assessment methods of the exposure to noise so as to measure, and to manage, its impact on the population.

As early as 2007, Members of Parliament have asked the European Commission, for instance, the question as to which studies and research it had undertaken « *regarding wind farms with regards to the Environmental Noise Directive 2002/49/EC?* ».[17]

In response to this question, the Commission indicated in 2008, on the one hand, that the Directive did not contain provisions on the noise emitted by wind turbine parks which therefore were Member States competence and, on the other hand, that « [t]*wo research projects — Sirocco* [Project N° ENK5-CT-2002-00702] *and Upwind* [Project N° SES6-CT-2006-019945] *— supported by the Fifth and Sixth Framework Programmes particularly address the noise from wind turbines and wind farms* ».

In practice, these two research projects (SIROCCO et UPWIND) focused on the performance of wind turbines and do not appear to have resulted in any specific action of the Union in terms of the management of wind turbines noise emissions.

The petitioners also note that the issue of wind turbines noise emissions is generic, that is to say covers a wide range of situations (in the same way, for instance, as noise emitted by road or rail transport).

On 8 February 2010, the Commission indicated that it was not informed of « *any national noise regulations associated with wind turbines*» and that it was « *not considering any EU-level initiative regarding to noise limits of wind turbines* ».[18]

More recently, a parliamentary question regarding the possible impact of wind turbines on human health in relation to the application of the Directive to wind turbines, to which the Commission has responded as follows:
«*Directive 2002/49/EC on the management of environmental noise does not contain any provisions concerning noise caused by wind turbines. Directive 2011/92/EU on the assessment of the effects of certain public and private projects stipulates that such assessments must take account of public health.*

In 2018, the World Health Organisation (WHO) expressed the view that noise caused by wind turbines could harm public health in certain cases. The organisation therefore introduced a noise limit of 45 dB. The WHO report also indicates that further research into the health impact of low-frequency noise from wind turbines is needed, for which reason this specific type of noise was not considered in the evaluation conducted.

1. Directive 2011/92/EU lays down that, in deciding where to site such installations as wind

17 Question of 20 December 2007, n°6464/2007
18 Response of 8 February 2010 to question P-0186/2010.

turbines, Member States must take account of the impact on public health. Does the Commission check whether the various national rules comply with this requirement?

2. Is the Commission aware of scientific studies which demonstrate the adverse impact of low frequency noise on public health? If so, what is the Commission's assessment of those studies?

3. In view of the WHO's observations, does the Commission support scientific research into the health impact of wind turbines in general and low-frequency noise in particular? »

In its response, the European Commission continues to state, ambiguously, that the Directive « *does not include specifically wind turbines or low-frequency noise in its scope* »[19] et does not itself envisage to act to remedy this situation :

« *The Environmental Impact Assessment (EIA) Directive requires projects likely to have significant effects on the environment are made subject to the requirement for a development consent and an assessment with regard to their effects on the environment, including population and human health. Wind farm projects have to be subject to an environmental impact assessment if, in a so-called screening procedure, the competent national authorities determine they are likely to have significant effects on environment.*

The Commission can confirm that it has recently assessed the correct transposition of the EIA Directive in all Member States, and initiated infringement procedures where necessary. As the Environmental Noise Directive 2002/49/EC focuses mainly on noise from transport and industry and does not include specifically wind turbines or low-frequency noise in its scope, the Commission has looked from the perspective of industrial noise into the issue at the time of adoption of the World Health Organization (WHO) guidelines.[20] The WHO indeed concluded that research was still needed also for low frequency noise. Overall, the Commission is not aware of other relevant scientific studies, demonstrating the adverse impact of low-frequency noise.

The Commission is aware that noise pollution is taken into account in the design and development of new and advanced wind turbines as well as in ongoing and future research and innovation projects. Many wind turbines will come at the end of their lifetime and could be replaced by these new and advance wind turbines. »

Respectfully, the petitioners find such a position highly contradictory.

First of all, the Commission does not dispute – and implicitly acknowledges – the existence of noise emissions from wind power plants and their impact on health. But the Commission is not considering to take action itself to remedy this issue, nor even, it seems, to act with a view to assess the noise emissions of wind turbines.

Further, the Commission accepts that the Directive currently does not contain any provisions relating to wind power installations. But does not address the question of whether the Directive should contain provisions relating to noise from wind turbines.

Finally, the Commission appears to be relying on the future replacement of current wind power plants with wind power plants which should be quieter. Apart from the fact that the Commission

19 Response of 30 June 2020 to parliamentary question 1861/2020
20 https://www.euro.who.int/__data/assets/pdf_file/0008/383921/noise-guidelines-eng.pdf?ua=1

uses the conditional mode ("*could*"), the petitioners note, on the contrary, that the standards body considers that the problem of noise emissions is "*practically eliminated*".[21]

In addition, as indicated in the technical summary attached in annex, it seems that the new generations of turbines, more powerful, produce on the contrary higher noise emissions.[22]

This is especially true for infrasound emissions: the blades of modern turbines are much longer and thus compress a longer air column when passing the mast. This causes infrasound emissions of lower frequency which tends to be more dangerous to human health.

The position of the European Commission therefore does not address, let alone act upon, the situation faced by populations affected by noise pollution from wind turbines.

In any event, it is desirable to create a framework that allows taking into account of testimonies of the affected population, in relation to the provisions of the Aarhus Convention on the participation of the public in environmental decisions.

(ii) Scope and limits of the WHO recommendation (2018)

The environmental noise guidelines for Europe of the WHO (2018) to which the Commission refers was established following the finding in 2010 of a need to update the previous guidelines and in particular to cover noise emissions from wind turbines.

The same WHO guidelines contained a detailed chapter dedicated to noise emissions from wind turbines :
*« For average noise exposure, the GDG **conditionally** recommends reducing noise levels produced by wind turbines below **45 dB** Lden, as wind turbine noise above this level is associated with adverse health effects.*

*To reduce health effects, the GDG **conditionally** recommends that policy-makers implement suitable measures to reduce noise exposure from wind turbines in the population exposed to levels above the guideline values for average noise exposure. No evidence is available, however, to facilitate the recommendation of one particular type of intervention over another.*

It follows that the WHO guidelines does not constitute a standard which could remedy the above mentioned legal gap in Union law.

On the contrary, and as their name suggests, the WHO guidelines recommends that countries and the Union further assess and understand noise disturbances from wind turbines.

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[21] For the reasons outlined in the annex of the present petition, a reduction of the noise emissions could be achieved through research but speaking of " *elimination* " of noise emission constitutes an overstatement.

[22] The most installed onshore wind turbines models from 2005 to 2015 (2 MW) have an acoustic power at the source (near the mast platform) of 104 dBA, as soon as the electricity production reaches about 1/3 of the their capacity.

The more powerful models installed in recent years (from 3 to 7 MW) are much noisier, for example 106.9 dBA for the Vestas 150 model (5.6 MW), which represents twice the noise emissions as previous wind turbines. The tightening of the blades (i.e. the installation of sawtooth trailing edges) allows a limited reduction in the noise emitted (of the order of 2 dBA), but it is not in general use.

The reading of the WHO guidelines conducted by the Commission results therefore in reversing the guidelines purpose since instead of acting (or of at least announcing its intention to act) on the basis of the said guidelines, the Commission refers to it as if were a default standard. Whereas it is precisely the reverse since the WHO guidelines encourages action to reduce further noise emissions, in particular that of wind turbines, with the added clarification that the *Lden* reference is not adequate with regard to noise from wind turbines, especially not for the infrasound emissions.

Furthermore, the objectives of the WHO guidelines, defined on the basis of 2010 data, is even more relevant today.

(iii) Need for rules of assessment and management of wind turbine noise

Several grounds would justify a new action from the Parliament and from the Union with a view to the introduction of provisions for the purpose of assessing and managing acoustic emissions (i.e. both infrasound and audible emissions) of wind turbines at an acceptable level.

First, the Directive covers in principle all acoustic sources to which the population may be exposed. There is therefore no doubt that noise emissions from wind turbines should be addressed under the Directive.

Secondly, the fact that wind turbines were not covered in the Directive as a source of acoustic emission probably result from their limited number as the time of its adoption. It is in any event, beyond doubt that the assessment and management of wind turbine noise is wholly justified today given their large and growing number throughout the Union.

Thirdly, the need for harmonised standards with regard to the assessment and the management of acoustic disturbances was recognized and successfully addressed in many areas (road and rail transport, outdoor equipment) which, from the point of view of noise emissions, are comparable to wind turbines.

Fourthly, it is long recognized that the adoption by the Union of provisions allowing the management of acoustic emissions, such as that of wind turbines, at the source is the most cost-efficient manner to reach the objective of protecting the health of Union citizens.

VI – CONCLUSIONS

The Associations submitting the present petition request the Committee of Petition to declare the present petition admissible.

The Collective requests the Committee of Petitions and the Parliament to request the European Commission to prepare a proposal to supplement Annex I to directive 2010/75 to include energy production equipment and in particular wind turbines and to prepare a legislative proposal introducing rules regarding :

- the recognition of wind turbines as sources of acoustic emissions, including infrasound and audible emissions;
- the measure of these acoustic emissions;
- the monitoring of acoustic emissions;
- the management of acoustic emissions;

- the information and the health and legal protection of the affected populations; and
- the study of the acoustic emission profiles of new wind turbine projects.

The petitioners are available to address with the Committee of Petitions and with the European Parliament in the context, for instance, of any information mission, any preparation of an initiative report and/or a resolution which could be decided.

Signatories in the name of petitioners,

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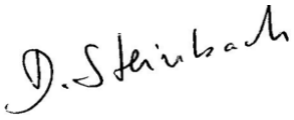

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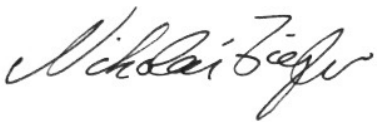

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ANNEX – CHARACTERISTICS OF WIND TURBINE NOISE

Noise emissions

In concrete terms, noise emissions from wind turbines beyond that of the machinery located at the top of the mast also includes the pressure peak generated by the blades passing the mast.

As wind increases, the more loud becomes the aerodynamic sound coming from the rotation of the blades. Conversely, the mechanical sound generated by the turbine is more prevalent in light winds.

The most frequently installed land wind turbines from 2005 to 2015 (2 MW) feature acoustic emissions at the source (close to the turbine itself) of 104 dBA, as soon as the production of electricity reaches about one third of their nominal capacity.[23]

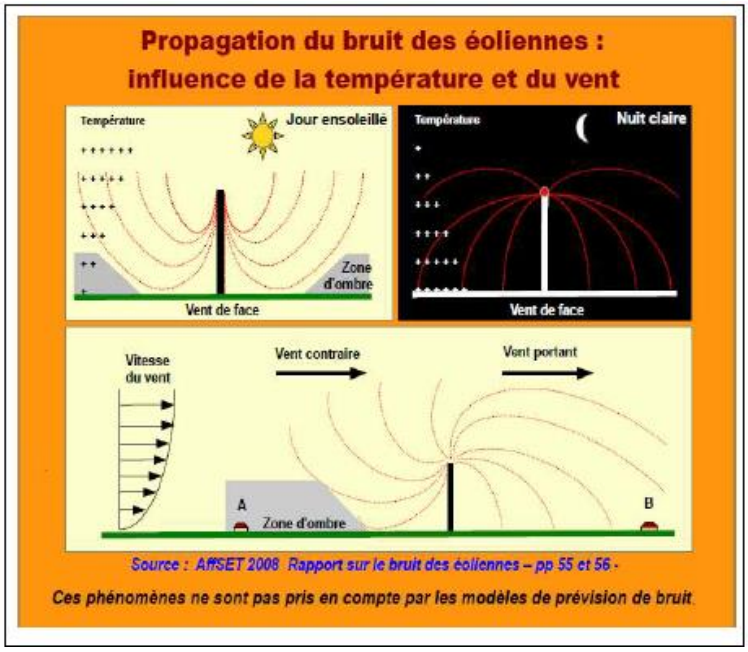
Since 2015, most turbine models installed years are more powerful (3 to 7 MW) and noisier, for instance 106,9 dBA for the Vestas 150 (5,6 MW), so a noise twice as powerful. The serration of blades (i.e. the fixing of trailing hedges on the blades) allows a limited reduction of the noise (about 2 dBA) while raising higher the acoustic emission spectrum thus making such emission more audible to the human ear.

Wind turbines also emit infrasounds which are low frequencies not perceived by the human ear but felt by the human body and organs. More precisely, such low frequencies are perceived by vibratory mechanisms involving throughout the human body. It is therefore necessary to add to measurements in dBA, low-frequency measurements that are unweighted, i.e. image the original emission of the wind turbine. Infrasounds propagate particularly far and cannot be dimmed by usual measures such as double glazing or noise defense walls.

Reducing the exposure of residents to noise to a single value is therefore unrealistic.

[23] The measurement in dB(A) excludes infrasounds.

Sound emitted by a wind turbine propagates in a funnel-like manner. The topography of the land, the cloud cover or the type of air masse play a major function in the way in which sound propagates.



Context

Industrial wind power parks are most often built in quiet countryside where the ambient noise is low. The constructions do not feature any protection against noise.

There are few obstacles to the propagation of noise, as noise emissions are high above trees and hedges which could slow it down.

Country life very often takes place outdoors, in direct sight of the source of the noise.