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IHCP
Institute for Health and Consumer Protection

Common Noise Assessment Methods in EU
CNOSSOS-EU

Analysis of the EU-MS feedback

on

JRC Reference Report on CNOSSOS-EU

(Draft, version of 28 May 2010)

[following the decisions of the Joint Regulatory Committee meeting on Noise, 11 June 2010]

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CONTEXT

During the last meeting of the Regulatory Committee on Noise (11 June 2010, Bruxelles), EU MS were invited by the Commission to nominate experts to be involved in the next steps of the process related to the development and implementation of CNOSSOS-EU. EU MS were also invited to send their comments on the draft JRC Reference Report on CNOSSOS-EU (version 2d of 28 May 2010) by the end of August 2010. They were asked to focus on three aspects in their comments:

1. general comments on the process, on the fit-for-purpose method and on the 2-level approach
2. more specific technical comments throughout the chapters of the report,
3. views and comments on (a) the level of detail to be included in the implementing decision, (b) which details to be left to the guidelines for the competent use of CNOSSOS-EU and (c) implementation time of CNOSSOS-EU including the testing/validation period.

GENERAL SITUATION on 9 November 2010

So far,

- **10** EU MS (*Austria, Denmark, France, Germany, Greece, the Netherlands, Slovak Republic, Spain, Sweden and United Kingdom*) **commented** on CNOSSOS-EU **and nominated experts**
- **10** EU MS (*Cyprus, Czech Republic, Finland, Ireland, Italy, Lithuania, Malta, Poland, Portugal, Romania*) and *Norway* **nominated experts** without commenting on CNOSSOS-EU
- **7** EU MS did not respond.

Experts nomination

So far, **47 experts** have been designated by the EU MS + **1** expert from Norway. In general, each MS nominated 1 or 2 experts. However, Austria and Germany nominated respectively 6 and 15 experts as they indicated different experts for different topics (i.e., road noise, railway noise, industrial noise, sound propagation, assessment, software).

Comments on the Draft JRC Reference Report on CNOSSOS-EU

Among the 10 EU MS who commented on the report:

- 5 EU MS (*Austria, Denmark, France, Greece, Slovak Republic*) provided only general comments
- 5 EU MS (*Germany, The Netherlands, Spain, Sweden, UK*) provided also detailed specific technical comments on the draft JRC Reference report. Among them:
  - 2 EU MS (*Germany, Spain*) provided specific views and comments on (a) the level of detail to be included in the implementing decision and (b) which details to be left to the guidelines for the competent use of CNOSSOS-EU
  - 1 EU MS (*Germany*) suggested a specific time plan concerning the (c) implementation time of CNOSSOS-EU including the testing/validation period.

GENERAL COMMENTS

1. General comments on the process and the principles of CNOSSOS-EU

1.1 Comments on the principle of Common Noise Assessment Methods

♦ EU MS widely express their support to the principle of a Common Noise Assessment Method to produce comparable results over Europe.

> "*A general harmonised calculation procedure is welcomed in any case*." (Austria).
>
> "*Denmark welcomes the continued development of a joint European noise assessment method, which is adapted specifically for strategic noise mapping and is based on the recent advances in the fields of noise generation mechanisms and sound propagation.*" (Denmark).
>
> "*Several French experts are closely monitoring the work of the community on the development of the common methodology, "CNOSSOS" intended eventually to replace the methodologies used up to the present by the Member States.*" (France).
>
> "*The German government in principle welcomes the introduction of common assessment methods*" (Germany).
>
> "*The advantages of a EU common noise calculation method are acknowledged*" (The Netherlands).

"*Slovak Republic welcomes very much the idea of common assessment methods, (…) mainly for the identification of serious noise situations affecting the large groups of population. We also assumed, these methods would contribute to provision of more compatible, reliable and comparable results at EU level and to increase prevention quality on local and regional level too*" (Slovak Republic).

"*The adoption of a common method is needed to achieve the objectives of the Directive END*" (Spain)

"*Sweden welcomes a common calculation method and we do think that the final product can be acceptable to us*" (Sweden).

"*The UK supports the aim of seeking properly consistent results across Europe, in terms of the information that the END requires to be reported. That is the number of people exposed to various levels of noise from particular sources (expressed in 5 dB bands) over a prescribed range for various indicators (but primarily L_{den} and L_{night})*" (UK).

♦ Some of them expect significant economic benefit from an improved common calculation method.

"*Economical benefits due to the use of improved common calculation methods are evident*" (Greece).

"*Although as a direct benefit the use of a common method allows for better comparison of results between member states and an improved assessment of the burden in the EU, there also benefits in economy*" (The Netherlands).

♦ One EU MS is more reluctant in the mandatory use of a common method and thinks that CNOSSOS-EU should remain indicative only

"*The approach being currently undertaken on the "CNOSSOS should remain indicative and member states should be able to continue to use their methodologies when they are compatible with the objectives of the directive*" (France).

♦ One EU MS is favourable to extend the use of CNOSSOS-EU for action planning as a substitute to national procedure.

"*Moreover it seems to be reasonable as well to use the common calculation procedure not only for strategic noise mapping, but to replace also the national calculation procedure in Austria by the common procedure.*" (Austria).

♦ How CNOSSOS-EU meets the requirements for a common calculation method is positively assessed by some EU MS.

> "*The method as now presented by the Commission institutes seems to fulfil the requirements for a common calculation method: - State of the art methods for propagation, screening and meteorology - Modular design enables its use as well on a strategic as on a detailed level - Consistency by separation between source and emission models*" (The Netherlands + Greece)

However, it is acknowledged that increased burden of calculation times and data collection efforts may be the unavoidable consequence:

> "*The price for this progress could be some increase in calculation times and an increase in the accuracy and or the number of data*" (The Netherlands + Greece).

♦ A specific concern on low noise assessment levels was expressed by one EU MS who recognised that this would be of interest to consider but might not be technically feasible:

> "*The UK agrees that it would be desirable for the mapping to capture a full range of noise exposure data, down to Lowest Observed Adverse Effect Level. However, such a desire should only be made mandatory if it is proven that it is technically feasible to secure sufficiently accurate results. At the moment the UK do not think that is the case, for example, with respect to obtaining reliable results for 40 dB* L_{night}" (UK).

1.2 Comments on the time schedule

All EU MS consider that CNOSSOS-EU cannot be used for the 2nd round of strategic noise mapping which is due by the end of 2012. The main reason is that CNOSSOS-EU is not yet ready to be implemented, more work and discussions are needed and all necessary input data are not available (see also the sections on "*further needs for implementation*" and "*standing technical issues*". Moreover, some EU MS have already started the data collection and assessment work for the 2nd round of strategic noise mapping with National or interim methods. However, it would be feasible to apply CNOSSOS-EU starting from the 3rd round of noise mapping provided that will be available by end of 2015.

> "*A detailed assessment can only take place after the "Guidelines for Competent Use of CNOSSOS-EU" are available*" (Austria).

> "*Denmark anticipates that the second phase of noise mapping for 2012 is carried out with the use of the same assessment methods as the first phase in 2007*." (Denmark).

"*The production of strategic noise maps for the 2012 deadline must be carried out using national methodologies which have already been approved by the European Commission in 2002. The requirement to use a particular methodology, notably CNOSSOS, would not allow the meeting of obligations of the directive and would require a very significant postponement of deadlines, of the order of 5 to 10 years*" (France).

"*I welcome the Commission's plan, expressed at the meeting of 11 June, to refrain from introducing binding common assessment methods for the second round of noise mapping, which has to be completed by 30 June 2012*" (Germany).

"*The common assessment methods should be available in good time before the third phase of noise mapping in 2017*" (Germany).

"31 Dec 2015 adoption of common assessment methods pursuant to Article 13 (2) of the Environmental Noise Directive in conjunction with Article (6) of Decision 1999/468/EC" (Germany).

"*It is virtual impossible to use CNOSSOS in the Netherlands for the 2nd round of mapping*" (The Netherlands).

"*We suppose, it´s not suitable to use these methods as a mandatory in the second phase of the END implementation (with deadline in 2012)*" (Slovak Republik).

"*Taking into account the current development of CNOSSOS-EU, we consider that it cannot be adopted on time for the 2 round of noise mapping*". "*CNOSSOS-EU wouldn't be adopted as European common method before 2012, once the method has been tested and its validity adequately verified*" (Spain).

"*However, we are not prepared to use the common method in the second phase of the directive. The reason for this is that the method is not fully developed, it has not yet been validated, the source data is not available and the application instructions are still missing*" (Sweden).

"*Given the work remaining to be completed, the UK believe the objective should be for all aspects of the finalised common method to be available for use for Round 3 mapping in 2017, subject to the various points mentioned in this document being addressed and resolved*" (U.K.).

1.3 Comments on the fit-for-purpose principle

♦ Some of the EU MS expressed concerns about the possible complexity and low practicability of CNOSSOS-EU that may make it inappropriate for the purpose of noise mapping:

"*The methods to be considered for the next deadlines must remain pragmatic and appropriate to the main issue, without being too unwieldy for the authorities concerned*" (France).

"*Common assessment methods must be fit for purpose. And they should only be as complex as is necessary for the purpose of mapping. The CNOSSOS draft does not meet these requirements…*" (Germany)

"*If highly complex assessment methods for action plans are developed at the second level first, there is a risk that this 'fit for purpose' criterion for the first level will be neglected*" (Germany).

"*When noise maps from different mapping rounds are compared, the same assessment method should be able to display developments in environmental noise, in particular the impact of implemented action plans*" (Germany).

♦ One EU MS asks for adaptability of the method for new modules or new indicators – presumably national specific.

"*It is important to specify whether the method is expandable or not*". "*We need a flexible model that can be adapted to national limits values or guideline values*". (Sweden)

1.4 Comments on the two-level approach

♦ The two-level approach is in general welcome, provided that the second level (for action plans) is not mandatory:

"*We agree with the two-level approach: a simplified level, MANDATORY, for strategic noise mapping, and a second level, VOLUNTARY, for actions plans and other applications*" (Spain).

"*The basic method can be used directly in the detailed mapping for action plans. For strategic noise mapping, a simplified version of the basic method is used. This principle is very important*" (Sweden).

"*The two-level approach for harmonised assessment methods being considered by the Commission cannot be implemented if it is also to be understood to mean the obligatory introduction of assessment methods for action plans. The two-level approach can only be a non-binding recommendation that may currently be useful for Member States which do not have national assessment methods and that possibly anticipates further harmonisation of noise assessment methods within the community*" (Germany).

♦ However, one EU MS mentioned inconsistency of the two-level approach, considering that the potential use of default values at the first level (for strategic noise mapping) will not lead to consistent results.

> "*Once Member States can be allowed to use default input data, consistency is lost"*…..then…… "*the two tier proposal is inconsistent*" (UK).

♦ Noise mitigation measures should have an impact on strategic noise maps, which implies that the same assessment method is used at both levels.

> "*If a fully common method is developed, (…), then that can be used both for strategic mapping and the consideration of the exposure and possible mitigation measures at specific locations. This would avoid potential difficulties that might arise. For example, with road traffic noise, traffic management schemes designed to improve smoother driving would have no impact on future strategic noise maps that use the simplified method as that assessment would assume constant speed.*" (UK)

1.5 Comments on the simplified approach for strategic noise mapping

♦ Application: the mandatory nature of the simplified approach for strategic noise mapping was supported by two EU MS. One of them also recommended to mention explicitly that strategic noise mapping results also provide information to support EU-level policy on noise source legislation (tyres, vehicles, road surfaces, flight restrictions, etc).

> "*Sweden supports that the proposal should be mandatory, otherwise the credibility of the collated data that are necessary as a basis for Community action under the Directive will be reduced*" (Sweden).

> "*The simplified application should be mandatory and restricted, preventing the possibility of introducing items or conditions different from those established for that levels of application. Therefore, it is proposed that, in general, all recommendations made by in the JRC document will become definitions of the simplified applications*" (Spain).

Spain recommended to clearly specify which parameters in the simplified method should be fixed and those data that should be fed into the method by the end-user without proposing any default value:

> "*It is therefore necessary to define those elements and items that the end user must not modify (e.g. order of reflection), and data that the user must obtain to feed the software (e.g.traffic input data for all four categories of vehicles)*" (Spain).

Moreover, the use of fixed default data according to some EU MS might lead to inconsistency of the overall assessment:

"*Simplified methods could be useful for critical decisions regarding the END objectives, but without application of default data, which may lead to the loss of correctness and comparability of results. Therefore, the uncertainty of CNOSSOS-EU is reasonable to be suggested or defined*" (Slovak Republic)

"*Once default data are used, the desired consistency is lost. So the first purpose of the method (strategic mapping, for which consistent results are desired and for which the common method was devised), will not, as defined in the Report, achieve consistent results*" (UK).

♦ Accuracy: as the accuracy of the methods is not known up to now, some EU MS anticipated that the method could be further simplified. See also the comments in the specific section on "Accuracy".

"*We lack an analysis of whether the accuracy is sufficient for the application's use or not. Accuracy of the method is probably unnecessarily high in relation to uncertainty prevailing in the real exposure*". "*The method might be further simplified without compromising its functionality*" (Sweden).

1.6 Comments on the full assessment method for action planning

♦ Application: some EU MS expressed that the choice of method for action planning should remain under the responsibility of local authorities and CNOSSOS-EU shouldn't be made mandatory by the Commission.

"*The CNOSSOS level 2 (action planning) can only be used on a voluntary basis*". "*the development of action plans, development of actions themselves or, in general, local expertise, goes beyond the ambitions fixed by the directive and encroaches on the margin for initiative of Member states*". "*The determination of the measures of action plans constitutes a political choice of the relevant authorities and has to stay this way.*" (France).

"*We support that the proposal should be optional since the method do not currently support the use of Swedish objectives and indicators and take no adequate account of Swedish conditions*". "*… our opinion is that the optional method should not support the EU-level policies*" (Sweden).

"*It is the UK view that, for the foreseeable future, action plans will be local. It is also the UK view that there is not a need for an EU wide precise mapping method to assist action planning*" (UK).

♦ Accuracy: the method is thought by one EU MS to have low accuracy in some cases as it omits relevant specific national characteristics:

> "*The method has in some cases low accuracy in the use for local actions. In particular, noise characteristics of Swedish road surfaces are missing and also, the different vehicle fleet in Sweden compared to the average conditions in Europe. We proposes a development of the method in these aspects.*" (Sweden).

2. General comments on the appropriate level of details

2.1 Comments on the appropriate level of complexity, simplifications, calculation time, transparency

♦ Complexity: CNOSSOS-EU is seen by some EU MS as a complex method:

> "*The model theory based on Fresnel zones is with the proposed calculation in third octave band very costly and elaborate. It is suggested to design the common calculation procedure as engineering procedure, provided that studies, which are still to be carried out show that the elaborate procedure proposed now does not result in significant improvements.*" (Austria)

> *"Factors of influence like spike tyres, age of rod surfacing, rail roughness, third octave spectrum, etc. are justified in concrete cases of application, however, for strategic noise mapping the simplified consideration must be regulated in a consistent way. Furthermore an assessment of the time of calculation depending on the input data seems to be absolutely reasonable"* (Austria).

♦ The necessary level of detail of assessment methods: the method should be accurate enough to show the effect of noise reducing measures but not excessively in order to avoid variability in the results. Complexity of the calculation methods may lower the precision (see also the section on "Validation"):

> "*The calculation procedure must show a well-balanced ratio of detailedness of the input parameters and robustness of application.*" (Austria).

> "*Thus, before introducing* (highly complex) *calculation models we should evaluate whether this disadvantage can be justified by a significant improvement in precision in the recording of physical phenomena. …This would require measuring to validate the (precision) data. However, this has not been done so far, and is a fault that needs to be rectified.*" (Germany)

It is specified that missing input data or introducing low quality input data in a complex method may lead to high variability in the results:

"*As input data is not available in sufficient detail or quality, and as both effort and costs to collect suitable data are too great, highly complex assessment methods are likely to lead to a wide range of results for different users. The complexity of the assessment methods should therefore take this actual situation and the quality of the input data into account*" (Germany).

♦ Transparency: CNOSSOS-EU should be precise, transparent and verifiable :

"*It is necessary that the calculation procedure is transparent*." (Austria).

"*So far, Germany and other Member States have used relatively straightforward methods to calculate exposure to environmental noise... These methods can be applied with high precision …, they are very transparent and verifiable… These requirements should generally be applied to common assessment methods as well.*" (Germany).

"*It must have a high level of precision, as binding legal claims will be derived from the calculation results.*" (Austria).

N.B: it should be underlined that this latter comment it is linked to the fact that Austria aims at using CNOSSOS-EU also for the enforcement of national laws.

♦ Time of calculation needs to be mitigated:

"*Furthermore an assessment of the time of calculation depending on the input data seems to be absolutely reasonable*" (Austria).

"*Any prolonged calculation times should be justified with additional benefits. However, the CNOSSOS draft prolongs the calculation processes by a factor of 20 to 50 compared to national methods*" (Germany).

N.B: the figures related to the calculation time indicated by Germany can be only considered as speculation as CNOSSOS-EU is still in draft, therefore not yet implemented in software and validated. Therefore there is no objective quantitative criterion to test its performance against existing national methods.

2.2 Comments on accuracy

Some EU MS request the EC to define the required accuracy of the results.

"*The required degree of accuracy of assessment methods for noise mapping should be defined (e.g. acceptable deviation for measurements in decibels). Only when such*

requirements for accuracy are laid down will it become clear which input data and parameters are practical and necessary." (Germany).

"*To secure the desired consistency of these estimated results* (the estimated number of people living in dwellings) *from Member States, the UK believes that the Commission (EC) must define the required accuracy of the results. This holds for the number of people exposed to a certain noise level band and for a noise level at a particular location.*" (UK)

3. General comments on implementation issues

3.1 Comments on the Guidelines for a competent use

♦ Guidance for a competent use of CNOSSOS-EU is claimed by several EU MS as an integral part of the common method.

"*Non-binding guidelines should be made available to the Member States regarding the application of the common assessment methods*" (Germany).

"*It is recommended to finalize CNOSSOS (by means of formal adaptation of Annex II) as soon as possible. This will allow MS's to compare their national outcomes to the standard. Guidance from JRC or EEA is much needed in this.*" (The Netherlands).

"*A guide of use, especially for the simplified application of CNOSSOS-EU is absolutely necessary. The method has to provide formulation and the guide has to define the input data needed for its application, including their accuracy*" (Spain).

"*It is very important that the instructions (Guidance) becomes clear when CNOSSOS calculations involves a lot of news for the normal consultant, mainly in terms of input data*" (Sweden).

♦ EU MS also expressed their views on what should the Guidelines contain: the Guidelines need to (a) indicate the impact of simplifications of input data and (b) to provide instructions on the evaluation of emission data (how to import national database in CNOSSOS-EU and how to introduce new data):

"*The guidelines must indicate clearly, how great the impact of possible individual simplifications of input data can be. Comparative calculations with detailed and simplified input data and a subsequent analysis of the results seem to be reasonable in this respect. Furthermore the guidelines must include instructions, how to transfer the emission data contained in the national calculation procedure to the common calculation procedure and how to determine new emission data or factors of influence (e.g. road surface layer, age factor). Also with respect to the required calculation time a revision and a comparison with existing models is necessary*" (Austria).

"*The guidelines should explain the competent application of assessment methods and the necessary quality of input data. Such guidelines in the form of "Good practice guides for noise mapping" have already proven useful for the first phase of noise mapping*". In addition, "*Guidelines should also give advice and explanations for applying assessment methods to special complex situations (e.g. valley zones, hillside areas, sound propagation over water etc.)*". Finally "*advice and processes for data collection and standardised values for individual parameters or standardised scenario descriptions are necessary*" (Germany).

"*It is essential to have a guide of use of CNOSSOS-EU. Beyond the concept and mathematical formulation of the method, this guide has to set the framework for its implementation, especially the simplified application, and it has to define the required accuracy of input data*" and "*The Good Practice Guide that will accompany the CNOSSOS-EU, must also define the conditions for characterisation of the areas assessed (terrain, buildings, obstacles, etc.), and the calculation conditions*" (Spain).

"*The results of the surveys do not necessarily bold the accuracy or details as suggested by the method*". "*We believe that it is important to point out that the results of the surveys depend to a great extent on knowledge and experience of how to perform calculations and/or mapping*" (Sweden).

"*In addition to common assessment methods pursuant to Article 6 of the Environmental Noise Directive, binding guidelines to assess the total number of people exposed to environmental noise should be established in line with Annex IV (9) and Annex VI (3) of the Directive. The guidelines should contain comprehensive provisions on the calculation method*" (Germany).

3.2 Implementation in a software code

Clarifications and justifications on the development of a EU calculation code were requested:

"*… the CNOSSOS-EU project intends to start developing software code. (…) This needs to be further explained, in particular consequences for existing mapping software market needs to be illustrated. Furthermore we believe that the need for a unique code is questionable, as there for sure are other reasons causing differences than the software implementation*" (Sweden).

"*The Report needs to make clear what is meant by EU calculation code*". "*The UK is concerned that if this is the only source code, i.e. lines of computer code, the compilation of that code into software will lead to differences in output, thus failing to meet the consistency objective of CNOSSOS-EU*". And "*before CNOSSOS-EU is mandated, it is essential that it will be clear how the method will be made available to Member States and that the process used will secure the consistency being sought. It is well known that the implementation of algorithms in software is susceptible to inconsistency*" (UK).

N.B: the representatives of the EU MS are kindly requested to refer to the outcome of and recommendations made during the ad hoc meeting with the noise software developers (8-9 March 2010, Ispra). The minutes of this meeting clarify the concept of the EU calculation code and can be found in DG ENV's CIRCA website on noise.

3.3 Validation and quality assurance system

♦ Validation

The validity of the method should be tested

> "*Validity of CNOSSOS-EU must to be tested, so first it must be completed and incorporated into the software. Then, a period of testing has to be opened as soon as possible in order to verify its validity and thus, may be adopted on time for the 3 round of SNM*" (Spain).

> "*Before CNOSSOS-EU is mandated, it is essential that a comprehensive validation process is undertaken.* (…) *the validation methodology will have to be carefully constructed*" (UK).

> "*We believe that prior to introducing common assessment methods a phase of comprehensive testing is necessary. First of all, test tasks should be provided and used to reveal errors in the description of calculation parameters and the implementation and application of calculation programmes. We cannot do without a comprehensive and systematic quality assurance for calculation processes. In Germany, for example, DIN 45687 has proven to be a reliable process*" (Germany).

> "*We have no information about verification of proposed common methods in other of European countries, how obtained results reflect real noise-environmental situation. We expect adapted software, which is not on the market this time with such complexity*" (Slovak Republic).

The practicability should also be checked:

> "*It must also be proven that the methods can be applied in practice.*" (Germany)

One EU MS suggested that in case the comparisons with measurements fail, national methods should be kept, but not Interim methods:

> "*For the common calculation procedure a comprehensive validation with noise levels resulting from measurements is required. If after all the introduction of the common calculation procedure CNOSSOS-EU should not take place, the maintenance of the national methods seems to be reasonable, and the use of interim methods as a common calculation procedure is rejected*" (Austria).

♦ Comparison with national methods:

For the transition from National methods to the new CNOSSOS-EU, a special attention to specific national conditions (e.g. mountainous sites) was requested:

> "*In order to able to identify in time problems which might occur in the course of a transition to the new procedure comparative calculations between the national procedure and the common procedure seem to be necessary for the identification of possible deviations. In this context, as well as in the case of the reparation of test examples for the software – attention should be paid to sufficient complexity (e.g. consideration also of difficult topographical conditions, such as Alpine conditions).*" (Austria).

♦ Quality assurance system

A quality assurance system was claimed:

> "*It is necessary that the calculation procedure is transparent. The possibility of a "manual" recalculation on the basis of discrete calculation formulas would significantly increase transparency*" (Austria).

> "*It is crucial that the calculation formulas and parameters of the assessment methods are described unambiguously and have a sound technical basis. In our view, this cannot be delivered by the centralised calculation tool as a basis for a software solution, as still envisaged by the JRC*" (Germany).

> "*It is therefore necessary to describe the procedure unambiguously and clearly for the purposes of a standard or a guideline and to make it available to an expert assessment*" (Austria).

Austria thinks it will be better achieved through the framework of international standardisation bodies:

> "*It is recommended to consult for the further development and/or maintenance of the calculation procedure the international standardisation bodies*" (Austria).

Type and extent of quality assurance system should be part of the assessment methods. Germany proposed to use DIN 45687 as a reference:

> "*In addition to the requirements listed above (accuracy, input data and parameters) this includes the provision of test tasks and complex testing scenarios. The procedure described in DIN 45687 (…) could be the basis for quality assurance*" (Germany).

4. General comments on technical issues

4.1 General technical comments

♦ The request for a 1/1 octave band method was expressed by several EU MS

> "*We certainly would prefer to have a method also in 1/1 octave bands, as is also proposed on pg.*34 under "simplified method"" (The Netherlands)
>
> "*It is considered appropriate to perform the calculation only in octave bands*" (Spain).

♦ One EU MS requested guidance to be provided for placing the receivers

> "*The Guide must establish criteria for placing the receivers in building façades (for example, at least one receiver in every façade and a receiver every 10m on façades more than 10 m. long). It will be also appropriate to draw up recommendations or criteria for different environments on the minimum mesh size when calculating noise levels to obtain noise contours*" (Spain).

♦ Road and railway traffic noise: some EU MS appreciated the use of a same methodology for road and railway traffic noise:

> "*We find it particularly relevant that this method is applied for road and rail traffic noise.*" (Denmark)
>
> "*It is considered positive that the method establishes a single approach to all sources of noise. It is a definite improvement on the interim methods*" (Spain).

N.B.: A number of comments and suggestions of what should be fixed in the simplified method and what should be specified in the Guidelines for most of the components was provided by one EU MS (Spain) (see the revised draft of CNOSSOS-EU)

♦ Aircraft noise: The choice of ECAC Doc.29 as the basis for common noise assessment method for aircraft noise was supported by several EU MS. However, more work is expected to check the applicability of the noise emission ANP-database to National specificities.

> "*We also find it relevant that the internationally approved method ECAC Doc. 29 is to be used for mapping of aircraft noise.*" (Denmark).

> "*The Greek delegation agrees to appointing ECAC doc 29 as the common method. However, there is considerable doubt if the ANP-database is sufficiently representative for the Greek situation. A test against the applicability of the German method AzB and the database is suggested. Moreover, it is suggested the Commission to verify the applicability of the ANP-database itself*" (Greece).
>
> "*the Dutch delegation agrees to appointing ECAC doc 29 as the common method. However, there is considerable doubt if the ANP-database is sufficiently representative for the Dutch situation. Therefore, a possibility for MS to complement the ANP-database should be introduced*" (The Netherlands).

However, one EU MS does not share this point of view and proposed the use of the German model and database AzD/AzB, provided some checks, data collections and model extensions are made.

> "*In view of the more sophisticated emission source model and the implementation which takes quality assurance aspects into consideration, the AzD/AzB would seem to be suited better for noise mapping procedures within the framework of the Environmental Noise Directive*" (Germany)

- Industrial noise: guidance on the database sound power emission was requested

> "*The criteria in CNOSSOS-EU regarding the number and position of the equivalent sources are adequate. The end user has to be responsible of sound power input data. In order to help him, it is recommended that databases containing power emission data of most common sources are available*" (Spain).

Two EU MS would prefer a different methodology for the noise assessment than the one proposed in CNOSSOS-EU, that is a method based on ISO 9613:

> "…*we suggest that the simpler method ISO 9613 can be used for noise mapping. This method is applied in several member states and is thus fused into their national regulation of noise from industries and enterprises. We also note that this type of noise is covered by the IPPC rules that enable the authorities to direct noisy industries to reduce their noise emissions.*" (Denmark).
>
> "*The propagation model should be consistent for all sources "close to the ground" (road traffic, rail traffic and industrial plants) and based on ISO 9613-2*" (Germany).

- Sound propagation: One EU MS claimed for validation of the new sound propagation module:

> "*The propagation method underwent serious adaptations from the Harmonoise/Imagine model. This means that the software validation that took place before, has to be reviewed.*" (The Netherlands).

One EU MS asked for a simplified application of the propagation method:

> "*As in the case of the description of noise sources, the document should define a simplified application of the method and establish needed requirements to input data, at least absorption of reflective elements and ground impedance (it is mentioned the establishment of classes)*" (Spain).

He also proposed to fix the order of reflections to n=1 in the simplified version

> "*A **fixed** order of reflection n = 1 is proposed*" (Spain).

One EU MS expressed that the sound propagation model proposed in CNOSSOS-EU is too complex and sensitive to parameter changes. Therefore, it should be based on the more robust, reliable and internationally standardised ISO 9613-2:

> "*The development of detailed methods for individual emission models is desirable. These methods should be able to show the effects of additional measures for action plans. However, it is unclear why the development of a new far more complex propagation model should be required for that objective, which is also much more sensitive to parameter changes than the more robust engineering method. ISO 9613-2 is an established successful engineering method, reliable and internationally standardized. It meets all the requirements of CNOSSOS-EU roadmap. Procedures could be clearly accelerated if propagation was based on ISO 9613-2 and efforts were focussed more clearly on emission models. The additional parameters, compared to ISO, are furthermore inconsistent - at least regarding current descriptions – and not well-balanced regarding details of individual physical phenomena.*
>
> *Proposal: The propagation model should be consistent for all sources "close to the ground" (road traffic, rail traffic and industrial plants) and based on ISO 9613-2*" (Germany).

♦ Digital Terrain Model: Common criteria for defining terrain model are requested by one EU MS:

> "*The guidance of competent use of CNOSSOS-EU should introduce recommendations on the accuracy of the digital terrain model (including buildings and obstacles). It is difficult to propose fixed parameters, but common criteria should be established*" (Spain)

4.2 Standing technical issues and further needs

♦ Needs were widely expressed concerning the method and its implementation: databases build up, guidelines for competent use, strategy for conversion of national databases, determination of meteorological input data, and software availability:

"*The CNOSSOS method is not ready yet, and needs to be complemented with an appropriate database, tested and verified into software. Unfortunately this is not on time for the second round of noise mapping, but we urge the Commission to make appropriate efforts to produce methods, databases and guidelines on their use as soon as possible and in any case to foresee a strategy to convert past data (L_{den}, L_{night}, population exposure) into a harmonized set of new data to improve credibility and validity of the results obtained by using Interim or national methods and allow comparisons among EU countries.*" (Greece).

"*An effort must be made to build up the databases of acoustic characterisation of sources (road surface types, types of trains, track types, industrial sources database, etc.). A guide of use, especially for the simplified application of CNOSSOS-EU is absolutely necessary*" (Spain).

"*standing issues:*

- *Instructions for the conversion of national emission data to make them suitable for use in CNOSSOS.*
- *A method to derive sound power levels from measurements;*
- *Segmentation method for railways is yet to be determined*
- *Method to derive metrological year averages from detailed weather data.*" (The Netherlands).

"*1. Proposed common methods include a lot of new computing relations and empirical equations, however, in some cases without proper evidence and clarification.*
2. Computing methods are developed elaborately, regarding a lot of marginal input environmental factors and conditions for which there are no data available presently with respect to mapping areas.
3. Common methods in many cases introduce new separate noise sources (for roads, railroads, etc.) for which appropriate emission data are missing yet (for example the vehicle fleet structure, road surface, railroad track structure, etc.)" (Slovak Republic).

♦ In particular, there is a need for more definitions and requirements in order to lead to consistent results: definition of agglomerations, sources to be considered inside agglomerations, accuracy requirements of input data, methods for assigning populations inside buildings, methods for assessing noise exposure.

"*For a truly common method that will secure consistent results regarding the population exposure in agglomerations and near to major roads and railways, the following elements need also to be addressed.*

- *The definition of the geographical definition of the agglomerations and, in particular, the sources within an agglomeration that should be mapped.*
- *Specifications are required about the accuracy of the input data. For example, the accuracy required of the traffic flow data; the speed data etc;*
- *The method to be used for defining the residential population database and the method for determining how noise exposure data are associated with that database in order to obtain the population exposure*" (UK).

"*We consider, as main reasons of inconsistency of present data among single countries, disunity and unclearness in following factors particularly:*

a) the methodology of processing and evaluation of noise exposure statistics,
b) the methodology, how the number of inhabitants is assigned to single buildings,
c) the methodology, how the inhabitants in every building are assigned to single facades, including the specified distance between calculating points and building facades,
d) the methodology of traffic density quantification, where data from regular monitoring are not available,
e) *the scope of road network considered as a noise sources in agglomeration, etc*" (Slovak Republic).

♦ One EU MS claimed for the development of a new module in CNOSSOS-EU on vibration and ground borne propagation:

"*CNOSSOS shall be the framework for a method with broader scopes, to include the vibrations of transportation means and noise induced by vibrations & ground borne noise in the modelling…*" (Greece)

♦ Reporting: one EU MS claimed for more help about what should be reported.

"*We consider that the decision must establish clearly the information that MS have to send to European Commission, especially regarding spatial data and other data not specifically required by the END Directive*" (Spain).

N.B.: This issue is currently treated by CNOSSOS-EU Task 9 led by EEA

5. Recommendations for further strategic development and implementation

5.1 Implementation

♦ Implementation costs: should be evaluated before mandating CNOSSOS-EU:

"*The common method must bear in mind the implementation costs for Member States. This would both be in terms of the level of detail required for input data, but also becoming proficient in the use of the new methodology overall. Again, knowing what accuracy is required with the final output will help inform this part of the process. The UK believes that a Regulatory Impact Assessment should be carried out before the common assessment is mandated*" (UK).

♦ Implementation timetable: a timetable is suggested by Germany of the different steps to be followed concurrently, including establishment, testing and qualification of CNOSSOS-EU.

> "*The common assessment methods should be available in good time before the third phase of noise mapping in 2017*" (Germany).
>
> "*By June 2011: coordination between Commission and Member States regarding requirements for common assessment methods including quality requirements*
>
> *By June 2013: development of common assessment methods by JRC in close cooperation with Member States*
>
> *30 June 2013 submission of Commission draft pursuant to Article 13 (2) of the Environmental Noise Directive in conjunction with Article 5 (2) of Decision 1999/468/EC*
>
> *By June 2014: elaboration of guidelines for application by JRC in cooperation with the Member States*
>
> *By January 2015: development of test tasks, subject to quality assurance, for the software implementation by JRC in cooperation with the Member States*
>
> *By July 2015: development of software programmes and quality assurance by software producers in cooperation with JRC*
>
> *31 Dec 2015 adoption of common assessment methods pursuant to Article 13 (2) of the Environmental Noise Directive in conjunction with Article (6) of Decision 1999/468/EC*" (Germany)

5.2 Comments on long term strategies

♦ A durable support over the years was claimed to maintain and update both the method and the database. The maintenance of the methods needs to be organised, in particular the feedback from the users.

> "*Without ensuring the permanent maintenance of the procedure it must not be expected that a common calculation procedure will be successful or will find broad application on the long run*". (Austria).
>
> "…*a commitment from the Commission is necessary to ensure the needed support to MS along the years*…" (Greece)
>
> "*Other important questions arise around the maintenance of the method. Apart from the appointment of a responsible authority, also the way in which the feedback from the users is organised has to be addressed*" (The Netherlands).

- Some ideas on the development strategies were proposed:

> "*Certainly, it will not be possible to implement fully some of the calculation methods described in the Report because the relevant data are not available. In order to address this point, the UK believes that the EC has some choices:*
>
> - *The EC could define the geographical scope of the mapping (e.g type of roads to include etc) and require Member States to obtain the necessary data to the required accuracy; or*
> - *The EC could carry out research to determine what data are readily available across Member States and tailor the scope accordingly; or*
> - *The range of results sought by the END could be reduced so that the mapping focussed only on the higher exposures where the risk to health effects is greater. This might mean tailoring the mapping to determining only how many people are exposed to more than, say, 70 L_{den} or 55 L_{night} and where they are located.*" (UK)

> "*We would recommend to continue in common methods development and to achieve the application progress by testing of these methods through the 2nd round of END implementation (by JRC) in parallel with existing interim methods*". "*Also we suggest to discuss the possibility of time synchronization or harmonization of the END deadlines with the deadlines of regular traffic density monitoring in Europe, if it´s relevant (for example DF1 update for major roads, etc.)*". (Slovak Republic).