The Institute of Acoustics' Response to the

Consultation on a new National Policy Statement for Fusion Energy

Introduction

The Institute of Acoustics (IOA) is the UK's professional body for those working in acoustics, noise and vibration. The IOA has some 3000 members from diverse backgrounds, with engineers, scientists, educators, lawyers, occupational hygienists, architects and environmental health officers among their number. This multidisciplinary culture provides a productive environment for cross-fertilisation of ideas and initiatives. The range of interests of members within the world of acoustics is equally wide, embracing such aspects as aerodynamics, architectural acoustics, building acoustics, electroacoustics, engineering dynamics, noise and vibration, hearing, speech, underwater acoustics, together with a variety of environmental aspects.

Members of the IOA regularly carry out noise impact assessments that contribute to the planning process.

Often in collaboration with other professional and trade bodies, such as the Chartered Institute of Environmental Health and the Association of Noise Consultants, the IOA publish a number of relevant guidance documents on noise and planning:

- **Professional Practice Guidance on Noise** - Planning and Noise
- **Professional Practice Guidance** - Gym Acoustics Guidance
- **Residential Guide** – Acoustics, Ventilation & Overheating Guide
- **Air Source Heat Pump Briefing Note** – Professional Advice Note

This consultation response was prepared by the following members of the IOA who have relevant expertise in the assessment of noise and vibration from nationally significant infrastructure projects, as well as the creation and implementation of local and national government noise policy:

- **Richard Perkins,** Chair IOA Renewable Energy Advisory Group and Technical Director (Acoustics) @ Mott MacDonald
- **Alistair Somerville,** IOA President
- **Matt Torjussen,** IOA Member of Council and ANV Measurement Systems
- **Stephen Turner,** IOA Immediate Past-President and ST Acoustics

Excessive noise can have wide-ranging impacts on the quality of human life and health such as annoyance, sleep disturbance, cardiovascular disease and mental ill-health. It can also have an impact on the environment and the use and enjoyment of areas of value such as quiet places and areas with high landscape quality.

The Proposed Approach to Siting Fusion Energy Facilities

1. Do you agree that the planning process for fusion energy facilities should be aligned and maintained with other complex energy generation facilities?

Yes. The Institute of Acoustics agrees that the planning process for fusion energy facilities should be aligned and maintained with other complex energy generation facilities. The Overarching National Policy Statement for Energy (EN-1) has proven effective in controlling the impacts of noise and vibration for other energy infrastructure projects, and this approach is well-suited for fusion energy facilities as well.

Whilst there are many technological differences between fusion and other power generation facilities, the likely sources of noise and vibration are very similar. Both types of facilities have large rotating machinery such as turbines and generators, pumps and compressors for cooling systems, transformers, and other mechanical and electrical equipment. Noise from any associated road and rail transport routes will also be similar; furthermore, construction noise and vibration from activities like piling, groundworks, and heavy vehicle movements would also be comparable.

The similar noise sources mean that the assessment methodology and mitigation approaches set out in EN-1 can be readily applied to fusion power plants. EN-1 requires applicants to include a noise and vibration chapter as part of the Environmental Statement where noise and vibration impacts are likely to arise.

2. Do you agree with the Government's proposal to include all fusion technologies in the NPS process?

Yes. The Institute of Acoustics agrees with the Government's proposal to include all fusion technologies in the same EN-8 National Policy Statement. As outlined in our response to the previous question, the noise and vibration sources are likely to be similar across different types of fusion power plants, just as they are comparable to other power generation facilities. Given these similarities, it is appropriate to assess and manage the acoustic impacts of various fusion technologies through the same NPS framework that has proven effective for other complex energy generation facilities.

3. Do you agree with the Government's proposal to take an open-sited approach in the fusion NPS process?

Yes. The Institute of Acoustics agrees with the Government's proposal to take an open-sited approach in the fusion National Policy Statement (NPS) process. Provided the noise and vibration assessment principles outlined in the Overarching National Policy Statement for Energy (EN-1) are followed, an open-sited approach allows for the selection of the most optimum location for fusion energy facilities.

The open-sited method enables developers to identify sites that best suit their specific fusion power plant technologies and requirements while considering a range of factors, including noise and vibration impacts. By following the robust assessment framework laid out in EN-1, developers can thoroughly evaluate the noise and vibration effects of their proposed sites and incorporate appropriate mitigation measures into their designs.

4. Do you agree with the Government's proposal to include all fusion energy facilities in England, independent of capacity, in the fusion NPS process?

Yes. The IOA agrees with the Government's proposal to include all fusion energy facilities, independent of capacity, in the same EN-8 National Policy Statement. As outlined in our response to previous questions, the noise and vibration sources are likely to be similar across different types of fusion power plants. Due to these similarities, it is appropriate to assess and manage the acoustic impacts of fusion energy facilities, independent of capacity, using the same assessment methodology.

5. Do you agree with the Government's proposal to include both thermal and electrical facilities in the fusion NSIP process?

Taking into account the importance of climate change and the impact that fusion energy could have on the reduction of carbon emissions, the IOA agrees with the Government's aim to streamline the planning process for fusion energy projects by including them within the NSIP regime.

The process provides a clear and consistent framework for assessment and ensures that the national importance of fusion energy development is recognised. The extensive consultation with local stakeholders that is a requirement of the NSIP process serves to ensure that local views on noise and vibration are considered.

6. Do you think the definition of a fusion energy facility, as provided in the Energy Act 2023, is suitable for distinguishing between a fusion energy facility and/or fusion research facility for the purpose of this NPS?

The IOA is agnostic on this issue. From an acoustic perspective, the key considerations for assessing and managing noise and vibration impacts will be factors such as the scale of the facility, its location relative to sensitive receptors, the specific design and layout of the plant, and the effectiveness of any mitigation measures employed. These factors are likely to be more influential than whether the facility is classified as a research or commercial energy generation site.

7. Do you agree with the Government's proposal to not set a deployment deadline for fusion energy facilities?

In terms of noise and vibration, the absence of a deployment deadline is unlikely to have a significant direct impact. The assessment and management of acoustic impacts will still be a key consideration in the planning and consenting process for fusion energy facilities, regardless of when they are deployed. The principles and requirements set out in EN-1 will continue to apply, ensuring that noise and vibration are thoroughly assessed and mitigated as needed in order to comply with the Government's overarching policy on noise (the Noise Policy Statement for England (NPSE)).

A rigid deadline could put undue pressure on the industry and lead to suboptimal decision-making. Not setting a deployment deadline ensures that the regulatory framework for fusion energy, including the proposed National Policy Statement (NPS), can be developed and implemented in a measured and comprehensive manner. This is likely to provide better outcomes in terms of noise and vibration.

8. Should developers consider any other factors in assessing reasonable alternatives for fusion energy facilities?

In assessing reasonable alternatives for fusion energy facilities, developers should primarily focus on the factors and principles outlined EN-1. EN-1 provides a comprehensive framework for considering alternative sites and technologies, which is applicable to fusion energy projects.

From a noise and vibration perspective, EN-1 requires developers to assess the acoustic impacts of their proposed projects and consider alternative sites or designs that could minimise these impacts. This includes evaluating the potential effects on sensitive receptors, such as residential areas, schools, and hospitals, and exploring options to avoid significant adverse noise and vibration impacts and to mitigate and minimise adverse noise and vibration effects within the context of Government policy on sustainable development.

9. Do you believe that the proposed criteria cover all aspects necessary for assessing the suitability of sites for fusion energy facilities?

The IOA believes that the assessment criteria outlined in EN-1 provide a solid foundation for evaluating the suitability of sites for fusion energy facilities. EN-1 sets out a comprehensive framework for assessing the impacts of energy infrastructure projects, including noise and vibration, which should be the primary basis for determining the appropriateness of a site for a fusion power plant.

EN-1 requires developers to conduct a thorough noise and vibration assessment as part of the Environmental Statement. This assessment must identify noise-generating aspects of the project, predict the expected noise levels, evaluate the effects on sensitive receptors, and propose appropriate mitigation measures. The criteria in EN-1 ensure that the acoustic impacts of a proposed site are fully considered and that any significant adverse effects are adequately addressed and avoided.

10. Are there any additional criteria that should be considered in the assessment process?

Please refer to the answer to the previous question.

11. Do you think there should there be a separate set of criteria for different fusion technologies?

No. The IOA is satisfied that the assessment criteria laid out in EN-1 is sufficient to assess different fusion technologies.

12. Do you agree with the proposed model for implementation of the Fusion NPS?

The IOA agrees that a developer-led approach to site selection can be successful, provided that is guided by the strategic criteria outlined in the NPS. This model aims to provide clarity and certainty to developers, regulators, and communities on how the planning process for fusion energy facilities will be carried out. However, from a noise and vibration perspective, the new NPS for fusion energy (EN-8) should rely on the existing Overarching National Policy Statement for Energy (EN-1) to provide a consistent and robust framework for assessing and managing acoustic impacts.

EN-1 sets out clear and comprehensive policies and guidelines for the assessment of noise and vibration impacts from energy infrastructure projects. It requires developers to conduct detailed noise and vibration assessments as part of the Environmental Statement, which must include:

- a description of the noise-generating aspects of the project;
- identification of noise-sensitive receptors;
- predictions of how noise levels will change due to the project;
- an assessment of the effects on sensitive receptors; and
- proposed measures to mitigate noise impacts.

These requirements ensure that the potential noise and vibration impacts of a project are thoroughly evaluated and that appropriate mitigation measures are put in place to protect local communities and the environment and that the requirements of the Government's overarching noise policy are met.

EN-1 also emphasises the need to consider the cumulative effects of noise and vibration in combination with other impacts, such as air quality and traffic. This holistic approach is crucial for understanding the overall impact of a project on the surrounding area and for identifying any potential interactions between different types of impacts.

Furthermore, EN-1 sets out clear expectations for the decision-making process, stating that the Secretary of State should not grant development consent unless they are satisfied that the proposals will:

- avoid significant adverse impacts on health and quality of life from noise;
- mitigate and minimise other adverse impacts on health and quality of life from noise; and
- where possible, contribute to improvements to health and quality of life through the effective management and control of noise.

These requirements align with the NPSE. Consequently, by relying on these established policies and guidelines from EN-1, the new fusion-specific NPS (EN-8) can ensure that noise and vibration impacts are assessed and managed consistently and effectively for fusion energy projects.

Appraisal of Sustainability Scoping Report - EN-8 on Fusion Energy

1. Have there been any omissions of policies, plans or programmes relevant to the scoping of the AoS?

The AoS includes a small number of noise and vibration-related policies, plans, or programmes, including:

- WHO Guidelines for Community Noise (1999)
- WHO Night Noise Guidelines for Europe (2009)
- WHO Environmental Noise Guidelines for the European Region (2018)
- Environmental Noise (England) Regulations 2006 as amended by The Environmental Noise (England) Amendment Regulations 2018
- JNCC guidelines for minimising the risk of injury to marine mammals from geophysical surveys 2017
- JNCC Statutory nature conservation agency protocol for minimising the risk of injury to marine mammals from piling noise 2010
- Noise Policy Statement for England (NPSE):
- TAN 11: Noise 1997
- PAN 1/2011 Planning and Noise
- Environmental Noise (Scotland) Regulations (2006) as amended by The Environmental Noise (Scotland) Amendment Regulations 2018

These are high-level documents and are generally not directly used to assess the impacts of construction and operational noise and vibration of nationally significant infrastructure projects in the UK.

The Appraisal of Sustainability (AoS) scoping report does not explicitly mention a number of noise and vibration-related policies and guidance, which are integral to the noise assessment framework in EN-1. These are:

- **Noise and Soundscape Action Plan 2018 to 2023:** The Welsh Government's overarching policy on noise.
- **Planning Practice Guidance for Noise:** This guidance provides advice on how planning can manage potential noise impacts in new development proposals. It covers aspects such as assessing noise levels, mitigation measures, and acceptable noise standards.
- **Environmental Protection Act 1990 (Part III):** This act deals with statutory nuisance, including noise nuisance, providing a framework for managing noise pollution through local authorities.
- **Control of Pollution Act 1974:** This act includes provisions for controlling noise from construction sites and other operations, allowing local authorities to impose noise control measures.
- **The Noise Insulation Regulations 1975** (as amended): These regulations require noise insulation to be provided for buildings affected by high levels of noise from new or altered roads.
- **The Noise Insulation (Railways and Other Guided Transport Systems) Regulations 1996:** These regulations require noise insulation to be provided for buildings affected by high levels of noise from new or altered railways.

In addition to the omitted policy and guidance documents above, the AoS also omits the following British Standards that also appear in EN-1:

- **BS 4142:** Methods for rating and assessing industrial and commercial sound.
- **BS 6472:** Guide to evaluation of human exposure to vibration in buildings (1 Hz to 80 Hz).
- **BS 8233:** Guidance on sound insulation and noise reduction for buildings.
- **BS 5228:** Code of practice for noise and vibration control on construction and open sites, which is divided into parts including:
- **BS 5228-1:** Noise
- **BS 5228-2:** Vibration

The IOA endorses an assessment approach for noise and vibration that relies more heavily on that laid out in EN-1.

2. Do you agree that the baseline data that have been, or will be collected, are relevant and of sufficient detail to support the AoS?

The AoS places emphasis on the importance of Road and Rail Important Areas and Quiet Areas defined by strategic noise mapping created under the Environmental Noise (England) Regulations 2006. There are, however, other noise sources that can influence the baseline environment. Consequently, in practice, baseline data used for the assessment of most nationally significant infrastructure structure projects must rely on project and site-specific surveys of the existing environment and consideration of existing noise sensitive receptors. This can include locations that are particularly sensitive to noise, such as residential areas, schools, hospitals, parks, and areas valued for their soundscape or landscape quality, including marine life.

The IOA endorses an assessment approach that is more in line with the Overarching National Policy Statement for Energy, EN-1.

3. Do you agree with the selection and definition of key sustainability issues?

The IOA agrees that the following noise and vibration sustainability issues from the AoS are important:

1. disturbance from construction and operational noise and vibration on nearby receptors, which include residential areas, schools, hospitals, parks, and areas valued for their soundscape or landscape quality;
2. development affects the historic environment through loss, damage or changes to setting for instance from visual intrusion, increased traffic, noise, or air pollution; and
3. the loss of tranquillity due to noise and vibration.

The IOA would also add the importance of considering the effects of construction and operational noise and vibration on local wildlife, including marine life, especially on protected species.

4. Are there any key baseline data available that have not been identified that are, or could be, use in support of the issues?

The Overarching National Policy Statement for Energy (EN-1) provides detailed guidance on the collection of noise and vibration baseline data as part of the environmental assessment process for proposed energy infrastructure projects. The IOA recommends the use of baseline data more aligned with EN-1.

To satisfy EN-1, the applicant must describe the existing noise environment, which includes the current levels of noise at different times of the day, evening, and night, as well as seasonal variations if relevant. This involves deploying noise monitoring equipment at various strategic locations within the study area to gather representative data.

The noise assessment should identify noise-sensitive receptors such as residential areas, schools, hospitals, and other community facilities. This is crucial for understanding the potential impacts on human health and well-being. The assessment must also consider areas particularly valued for their soundscape or landscape quality.

5. Do you agree with the implications and opportunities that have been identified for the emerging NPS EN-8?

The IOA agrees that there are opportunities to:

- avoid harm to heritage assets due to excess noise and vibration;
- minimise noise and vibration from construction and operational activities on residential amenity and on sensitive locations, receptors and views; and
- minimise issues that can affect communities and their facilities including air, noise and light pollution, as well as vibration.

The IOA would also like to highlight that, through the effective management and control of noise, it is possible to more generally:

- avoid significant adverse impacts on health and quality of life from noise;
- mitigate and minimise other adverse impacts on health and quality of life from noise; and
- where possible, contribute to improvements to health and quality of life through the effective management and control of noise.

within the context of Government policy on sustainability as outlined in the Overarching National Policy Statement for Energy (EN-1).

6. Do the AoS objectives and decision-making questions provide a sound framework against which to assess the sustainability performance of the emerging NPS EN-8?

The IOA believes that, whilst the objectives and decision-making questions are important, they should be made more general to reflect the decision-making guidance in EN-1, which states that through the effective management and control of noise, it is possible to:

- avoid significant adverse impacts on health and quality of life from noise;
- mitigate and minimise other adverse impacts on health and quality of life from noise; and
- where possible, contribute to improvements to health and quality of life through the effective management and control of noise.

7. Do you agree that aligning the assessment scale of the emerging NPS EN-8 with that of the AoS of EN-1 to EN-5 is a reasonable approach?

The IOA agrees that aligning the assessment scale of the emerging NPS EN-8 with that of the AoS of EN-1 to EN-5 is a reasonable approach.

8. Do you have further suggestions regarding the scope of the AoS and its proposed assessment of NPS EN-8 on fusion energy?

See previous question responses.

The IOA hopes that the Government will find these responses helpful. Relevant members of the IOA would be happy to meet with officials to discuss this response if that would be of assistance.