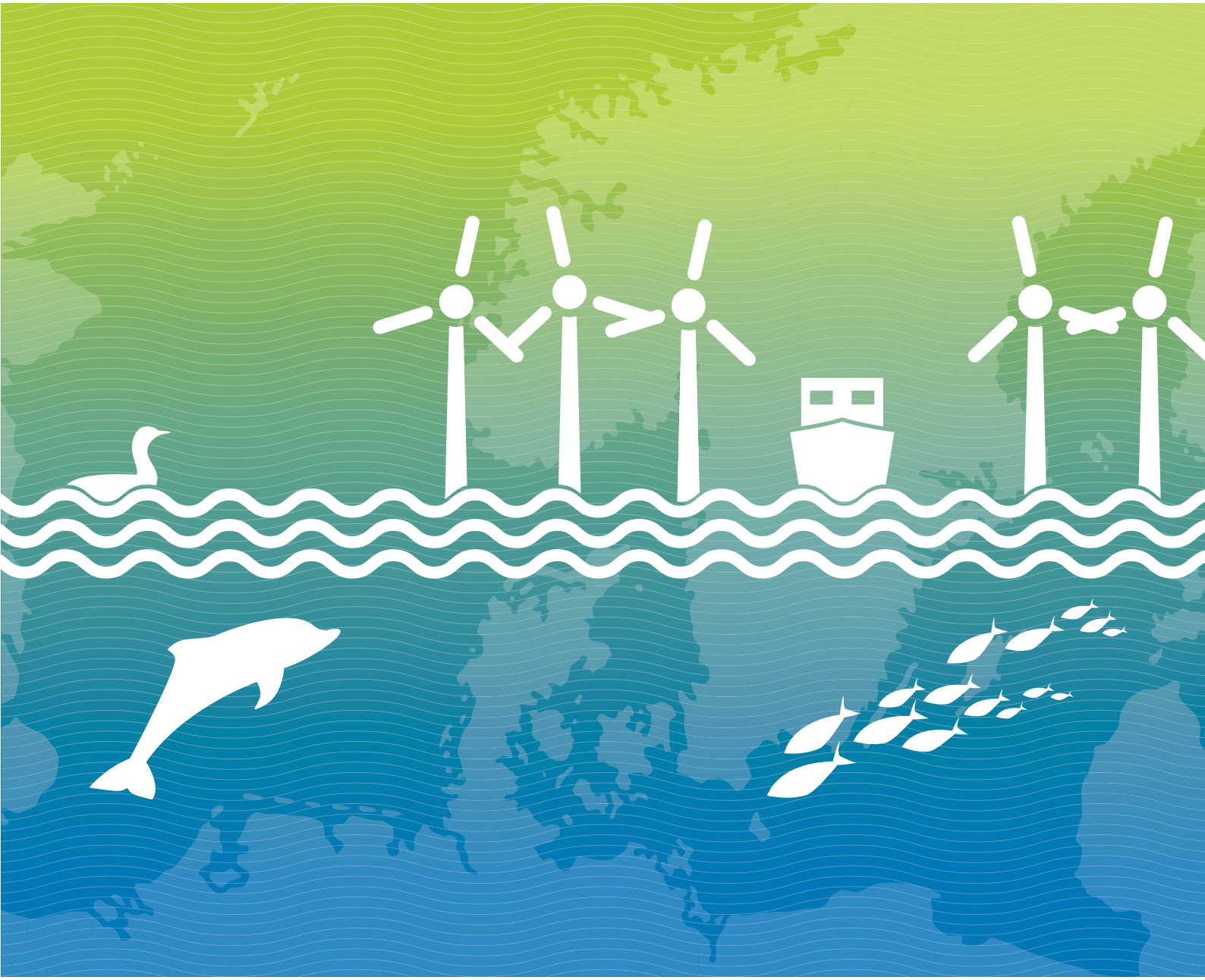
Deutsche Umwelthilfe



Perspectives for the offshore wind energy sector

Preserving species and fighting climate change

Position Paper | As of 26th February 2020

Our demands at a glance

1. The offshore wind expansion target of 20 GW by 2030 needs to be laid down in the German Renewable Energies Act (EEG).
2. Already today, offshore spatial planning needs to both expand its time frame to 2050 and comply with nature conservation requirements.
3. Future grid connections must be planned up until 2050 for both offshore and onshore.
4. The North Sea adjacent countries should co-plan their activities and draft a joint North Sea offshore strategy.
5. Measures to provide relief for species and habitats, such as low-noise foundation options, need to be developed further and applied in a binding manner.
6. A pilot plant for hydrogen generation using offshore wind energy must make this new option assessable as soon as possible.

1. Importance of climate protection and preserving biodiversity

The dramatic loss of biodiversity as well as the climate crisis are equally putting our natural living conditions at risk. Our society is therefore faced with a double challenge: the loss of biodiversity needs to be put to an end while the climate crisis needs to be averted by a complete switch to renewable energies.

The decline in the number of species and destruction of habitats continues to accelerate globally. According to the report published by the World Biodiversity Council (IPBES) in spring 2019, up to one million different species are threatened with extinction, many of which in the next few decades. Precious ecosystems are increasingly being damaged, putting the essential services they provide for humans at risk. However, biological diversity and ecosystem services, such as nutrition, clean water and medicine, are essential to the survival of the human race. As a result, the Parties to the Convention on Biological Diversity (CBD) set the target of stopping the loss of biodiversity by 2020. They did so at a global, EU and Germany-wide level. However, the situation has continued to worsen. The key drivers behind this negative development include land and marine use, environmental pollution and climate change as well.

Not only the extinction of species can already be measured and felt. The same is true for climate change. The average global temperature has increased by approximately 1.1 degrees compared to pre-industrial levels. As a consequence, the threat of droughts, floods and other forms of extreme weather increases with far-reaching implications. These include water scarcity, the spread of diseases and loss of habitats. In accordance with the Paris Agreement, the German Government has committed to limiting the level of warming to a maximum of 1.5 degrees. This will require a rapid reduction in greenhouse gas emissions. The only

way to do so is to cover our energy needs almost exclusively by renewable energies.

In Germany, the generation of wind power at sea (offshore wind) will play a key role. The deployment of offshore wind turbines will need to be expanded significantly for climate protection purposes. However, as is the case with any form of use, the construction and operation of these turbines will have an impact on species and habitats. Climate protection and the protection of species need to go hand in hand. This challenge has not always been handled well in the past. In this paper, Environmental Action Germany describes various approaches how to expand the deployment of offshore wind turbines in the North Sea and Baltic Sea whilst keeping habitat and species distress to a minimum.

2. Expansion and spatial requirements for offshore wind energy

The current installed capacity in the North Sea and Baltic Sea is 6.6 GW (as of mid 2019). Offshore wind is able to provide around 28 TWh, i.e. five percent of Germany's power demand each year. A significant increase is required in order to achieve the various climate targets. In its climate package, the German Government established an expansion target of 20 GW of installed capacity by 2030. The demand for offshore wind energy will grow to approximately 50 GW by 2050.

As a result, the construction of additional offshore wind turbines is not an alternative to onshore wind or photovoltaic energy but is required in addition. The high levels of demand for renewable electricity leave no scope for certain renewable energies to be dispensed of. An offset between the various forms of generation is only possible to a very limited extent.

The benefits of offshore wind energy suggest exploiting its potential as fully possible, namely:

- Continuous power supply, highly predictable ("punctual", approx. 4,000 full load hours p.a.; 8,700 hours of operation p.a.; 363 days of power production p.a.)
- High level of security of supply (less control energy required)
- High level of system security (less demand for flexibility for the entire system, less storage facilities, less intervention in the overall system)
- High level of acceptance among the population

3. Challenges for nature conservation and the protection of species

The expansion of offshore wind energy entails serious risks for marine life and the marine environment. This applies to the structural measures required as well as to the operation, maintenance, dismantling work and connection to the grid. Birds, marine mammals, fish, invertebrates and benthic communities will all be affected, depending on the foundation option and technology involved. Solutions need to be identified, particularly for the following challenges.

3.1 Area selection

The selection of suitable locations for wind turbines at sea is of particular importance. This needs to be carried out in an independent manner, coordinated by the various authorities and subject to strict compliance with nature conservation requirements.

3.2 Underwater noise pollution

To date, pile driving through hammering is the most frequent foundation option used. Years of research and the development of measures to lower sound emissions now enable compliance with the statutory threshold values. However, in order to ensure even better protection for species that are sensitive to noise such as porpoises, it is urgently necessary to further develop technical noise mitigation concepts and alternative foundation methods against underwater noise during the construction of the power plants. These concepts must then be applied in all German maritime waters. Regulatory authorities, industry and science are all jointly responsible here. Pile driving through hammering in conjunction with technical sound protection measures must be regarded as a temporary solution until environmentally friendly, low-noise foundation options become available. The general principle of “noise prevention over noise reduction“ is to be applied.

3.3 Collisions with birds

Depending on the location of the turbines, there can be a high risk of migratory birds colliding. This risk needs to be accounted for during the spatial planning. Areas not yet covered in the 2019 Site Development Plan (FEP 2019) must no longer be allocated, particularly in the Baltic Sea. Furthermore, lighting options and cut-off mechanisms need to be optimised.

3.4 Avoidance behaviour

Certain species will give wind turbines a wide berth. Red-throated and black-throated divers, for example, will stay clear in a radius of up to 16 kilometres. Wind turbines therefore narrow the habitat of certain species which may result in its population declining. This must be taken into account during the selection process of locations. Further research is required here in order to close knowledge gaps regarding the impact of avoidance behaviour.

3.5 Impairment of protected sites

Experience shows that wind farms located directly next to protected sites or even within said sites entail a massive risk of conflict. In order to implement the targets stipulated under European laws regarding nature conversation and the protection of species (Natura 2000) and the Marine Strategy Framework Directive (MSFD), along with international conventions such as the Bonn Convention on Migratory Species, there should be no expansion nor repowering of wind turbines in these protected sites. Migratory species include, for example, loons and porpoises, as well as other marine mammals.

Depending on the range of species involved, this also applies within a sufficiently wide buffer around these sites, such as in the case of Dogger Bank. Failure to do so means risking meeting the target of protecting essential feeding and resting habitats for species protected by the EU Birds Directive. This would constitute a breach of the so-called non-deterioration obligation of the Habitats Directive. In such cases, in addition to measures such as reducing fishing or mining, the (partial) dismantling of the wind farm in question should also be considered as a potential last resort.

4. Regarding climate protection and protection of biodiversity as one

4.1 Ambitious expansion targets laid down in law

The target of a 65% share of renewable energies in gross electricity consumption needs to be laid down in the German Renewable Energies Act (EEG). The same applies to the 20 GW offshore wind expansion target by 2030. Thoughtful planning is only possible if the framework conditions in place are solid and reliable.

4.2 Forward-thinking spatial planning and connection planning

In order to facilitate the necessary expansion of offshore wind energy, enough area available for the wind farms and the offshore grid connections is required. Also, the onshore power grid must have the capacity for the power plants to submit energy. Because of the complex planning and construction, the spatial and connection planning must start very early. The German Government is responsible here: It needs to assess the suitability of areas in the exclusive economic zone (EEZ) from a nature conservation and technical perspective. It must then allocate suitable areas for offshore wind farms in the Site Development Plan (FEP) and/or tender them at a later date. This possibly requires the development of a model enabling the subsequent refinancing of this preliminary work by the turbine operators. At the same time, the various power lines required to dissipate the electricity must be planned in the Site Development Plan (FEP) and in the Network Development Plan (NEP).

The ongoing updating of the spatial development plan for the EEZ needs to be implemented quickly as it forms the basis for the next Site Development Plan (FEP). The Federal Ministry of the Interior, Building and Community (BMI) is planning to submit a draft version of the updated spatial development plan by mid-2020. This could then potentially enter into force by mid-2021. It is essential that this schedule is adhered to. The areas suitable for wind energy need to be reported as priority areas for the use of wind power in the spatial development plan, thereby accelerating the subsequent spatial planning. The spatial development plan should also include a site for a potential power-to-gas plant as a pilot project. At the same time, priority areas for nature conservation need to be identified.

An update of the Site Development Plan (FEP) needs to directly follow the update to the spatial development plans for the North Sea and Baltic Sea. The target year here needs to be 2050. In order to achieve this, a "provisional offshore expansion target" for 2050 for the Site Development Plan (FEP) needs to be laid down in the magnitude of 50 GW. The fact the Site Development Plan (FEP) schedule only runs up to 2030 is not sufficient. It is not just the wind farms but also the offshore connecting power lines and the onshore grid that need to be planned and built, too. If hydrogen is generated using offshore wind, gas pipelines, storage facilities, booster stations, etc. are required. The processes involved to build these plants are lengthy. Long-term planning enables mutual consideration within the various planning procedures and ensures enough time for all of the necessary processes. It is only by having long-term planning security that the required investments can be safeguarded, too.

In parallel to the Site Development Plan (FEP), the Network Development Plan (NEP) needs to be written, at the very least in the form of a sensitivity analysis by the target year of 2050. This is the only way to ensure that electricity generated offshore can be transported farther onshore. The area allocation in the Site Development Plan (FEP) must therefore be the basis for the demand forecast for the Network Development Plan (NEP).

The Federal Maritime and Hydrographic Agency of Germany (BSH), the Federal Agency for Nature Conservation (BfN) as well as companies must have sufficient staff and equipment at their disposal for all official processes.

4.3 Guidelines for subsequent spatial planning

Areas allocated for new wind farms may be subdued in the North Sea. However, given its paramount importance for bird migration and its role as a winter resting site, any further expansion in the Baltic Sea beyond the limits of the 2019 Site Development Plan (FEP 2019) must be completely abstained from. Repowering needs to be facilitated in the Baltic Sea wind farms, outside of the protected sites and as subject to sufficiently broad buffer zones.

The area O-1.3 in the Baltic Sea allocated in the 2019 Site Development Plan (FEP 2019) must be viewed critically. There is a high risk of conflict concerning bird migration. This needs to be examined in greater detail as part of the ongoing pilot surveying of the area. If need be, the area in question must be taken out of the Site Development Plan (FEP).

The areas N11 and N13 in the North Sea allocated in the 2019 Site Development Plan (FEP 2019) must be excluded from any use for wind energy purposes given its role as a core habitat for loons.

The spatial planning should aim to have as few grid connection systems (power lines) as possible, whilst also keeping the areas in question as consolidated as possible. This will ensure the overall spatial usage is minimised. Consolidated areas lead to fewer boundary effects around the wind farm areas.

With regard to the auctioning of areas to project developers, attention must be paid to ensure that the concepts and processes for offshore connection and the distribution of electricity onshore are in place in order to avoid any bottlenecks. This also applies to Power-to-X plants and their connection to the gas distribution system.

4.4 Development of a North Sea offshore strategy

It is important to clarify as quickly as possible, within the framework of forward-looking spatial planning, what additional level of potential there is for eco-friendly wind energy in the German EEZ in the North Sea beyond the existing plans. This relates in particular to the area northwest of shipping lane 10 and southeast of Dogger Bank.

In order to offset any area deficits in the national EEZ, spaces outside of the German EEZ may also be subdued. In order to ensure the process is efficient and to minimise space usage, the countries adjacent to the North Sea should draw up plans together and draft a joint North Sea offshore strategy.

By introducing joint planning for wind farms and grid connections and establishing several offshore distribution hubs, the supply with renewable energy can be arranged in a more efficient and environmentally friendly manner. Furthermore, additional requirements for the energy system of the future such as the provision of flexibility and security of supply, can be better safeguarded through collaboration. Germany should use its EU presidency of the European Council as well as its presidency in the North Seas Energy Cooperation (NESC) in order to implement processes for the development and implementation of a joint North Sea offshore strategy. As an important impetus, Germany should host an energy conference for the North Sea adjacent countries.

4.5 Measures to reduce pressure on species and habitats

4.5.1 Technical measures

The impact of offshore wind energy on species and habitats can be reduced through a variety of measures. The implementation of sound mitigation measures and application of low-noise technologies - supported by an exchange of views organised and presented by the DUH – already achieved promising results. However, further improvements are required. Regulatory authorities, industry and science must work together to replace pile driving through hammering. This is especially important given that the turbines tend to be taller and deeper and/or an increased number of foundation piles are required. Preference should also be given to foundation options that are less damaging to the seabed.

Bird collisions can be reduced by adjustable lighting on the turbines and cut-off times. Further research and development is necessary in order to optimise this automatic cut-off system.

4.5.2 Planning measures

In the operation of the turbines, it is important to reduce construction, maintenance and supply traffic as much as possible through appropriate management, especially in areas surrounding bird sanctuaries.

4.5.3 Compensation

To date, the construction of offshore wind farms has been excluded from the intervention rule. As this is to be rejected from a nature conservation point of view, it should be included in the Federal

Compensation Ordinance (Bundeskompensationsverordnung) by 2026 at the latest.

The active settlement of mussel beds, lobsters etc. in offshore wind farms is counter-productive. They do not belong in this habitat and are regularly disturbed during maintenance and repair work.

4.5.4 Ban on fishing

The ban on fishing in offshore wind farms must be upheld at all costs, as it contributes to the recovery of stocks or even to the formation of new source populations of various species of fish. These "zero exploitation zones" must reliably serve as refuges and must not be de facto undermined by aquacultures etc.

4.5.5 Reducing overall spatial use

Less fishing, less shipping traffic and less extraction of raw materials can help to reduce the pressure on species and habitats and, in return, make offshore wind energy a feasible option. If the use of areas for the energy transition is to be prioritised but the land in question is not to be overburdened, other forms of use must be reduced accordingly.

4.6 Power-to-Gas

The generation of hydrogen from offshore wind energy is technically possible and provides an opportunity to store and/or redirect renewable energy via the gas distribution system. Therefore, this option should be explored by way of an alternative use of offshore electricity through a pilot system.

4.7 Costs

With increasing distance from the coast, the costs of wind turbines and connecting power lines will rise. Any decision to auction these areas for wind energy purposes must also be made with regards to costs.

5. Summary

Offshore wind farms will have to make a significant contribution to the energy transition in the future. The spatial needs already identified in the Site Development Plan (FEP) will roughly double by 2050 in order to cater for a 50 GW expansion. Due to very long lead times up to the implementation of turbines and connecting lines, spatial use must already be planned ahead until 2050 while also adhering to nature conservation planning principles. We therefore call for cooperation between the ministries involved, namely the BMI, BMVI, BMWi and BMU, with an annual progress report to the Parliament on the current status of plans. In order to ensure efficient land use, we believe it is necessary for the North Sea adjacent countries to introduce a joint North Sea offshore strategy. The Federal Government needs to take the initiative here.

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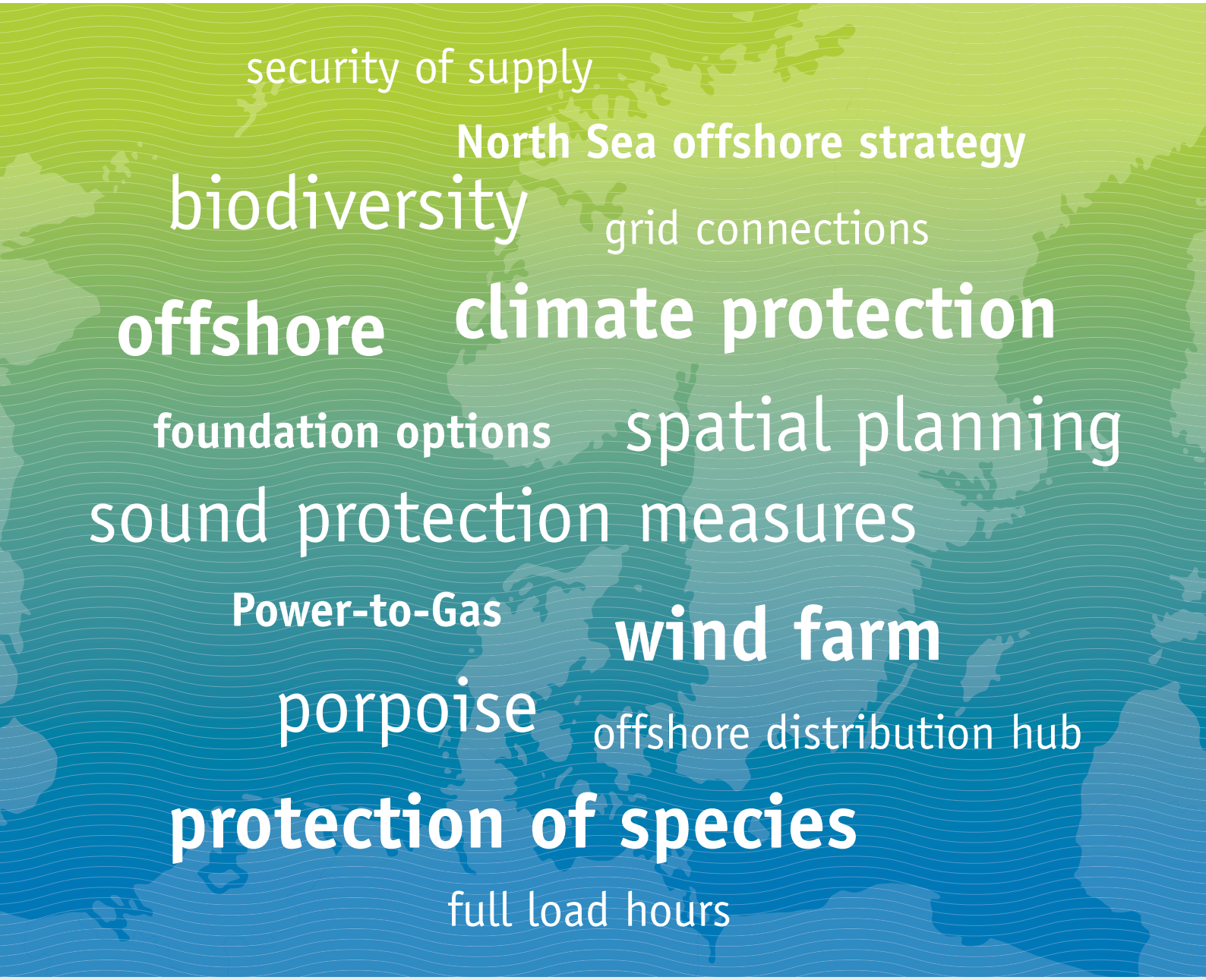

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