

June 2010

**Summary of the proposal for environmental investigation  
program for the fixed link across Fehmarnbelt (coast-coast)**

# **Summary of the Scoping Report**

English version




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The English version of the “Summary of the Scoping Report” has been translated into the nine languages of the Baltic Sea region. In the event that any of the Translations and the English version conflict, the English version shall prevail. Translated versions are for information only.



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## Summary of the Scoping Report

This scoping report describes the content and scope of the investigations on the natural and environmental conditions which are to be carried out in connection with the project planning of the fixed link across the Fehmarnbelt.

### 1. Introduction

On 3 September 2008, Denmark and Germany signed a treaty concerning the construction of a fixed link across the Fehmarnbelt. The treaty was ratified by the two countries in 2009. Denmark is responsible for the planning, design, financing, construction and operation of the Fehmarnbelt link and shall bear the expenses for the user funded link.

Denmark will remain the sole owner and operator of the fixed link.

Denmark will approve the project under its sovereignty, whilst Germany will approve the project under its sovereignty.

The fixed link across the Fehmarnbelt is a high priority project in connection with the expansion of the trans-European transport network and the European Commission has already announced EU funding of more than DKK 2.5 billion for the period 2007-2013 via the Trans-European Network Programme (TEN).

The objective is that the fixed link will be open for traffic in 2018.

In April 2009, the Danish Minister for Transport assigned to the 100% state-owned company Femern A/S the responsibility for the project planning of the coast-to-coast link.

The effects of the project on the environment will be assessed in accordance with the treaty and national legislation. This assessment will also take international legal requirements and applicable practice into account. Among other things this assessment will reflect the project's cross-border effects in order to obtain an approval of the fixed link across the Fehmarnbelt.

Femern A/S has been tasked by the Danish Ministry for Transport to carry out environmental investigations which will allow the project's environmental impact to be identified, described and assessed. The results will be described in an EIA report which will be drafted by Femern A/S.

In Germany major road and rail projects are authorized through a plan approval which authorizes the technical project planning, the location of the project and the full set of sectors and interests affected by the project, including environmental interests, during both the construction and the operating phase. Thus the EIA report constitutes an element of the overall project application in Germany, which will be assessed by the responsible authority.

As a basis for the environmental impact assessment, a scoping process will be carried out. The purpose of this is to decide on methods, content and scope of environmental investigations and assessments. In the present scoping report Femern A/S presents a proposal for an investigation programme in order to have this approved by the responsible authorities in Denmark and Germany.

In accordance with the Espoo Convention, the countries in the Baltic Sea Area will also be invited to participate in the consultation. In Denmark, the Ministry of the Environment via the Agency for Spatial and Environmental Planning is responsible for this consultation.

Thus the scoping report is being issued in a parallel consultation in Denmark, Germany and the other countries surrounding the Baltic Sea. The consultation period is set to eleven weeks, commencing on the 21.06.2010 and ending on the 06.09.2010.

Following completion of the consultation period in Denmark, the Minister for Transport will draft a consultation memorandum by agreement with the Minister for the Environment, expressing views on the consultation responses received. The scoping report will along with the consultation memorandum form the final basis for the environmental investigation programme to be executed by Femern A/S in respect of the project.

The results of the environmental investigation will be presented in the EIA report which is expected to be issued over the consultation period towards the end of 2011. Following completion of the consultation period the Minister for Transport will draft a consultation memorandum in agreement with the Minister for the Environment, expressing views on the consultation responses. The final EIA report will then be published.

The EIA report will be included as an element of the proposal for the construction act in Denmark.

In Germany the EIA report will be a part of the plan approval process, which as mentioned above is a prerequisite for an overall authority approval for the project as a whole.

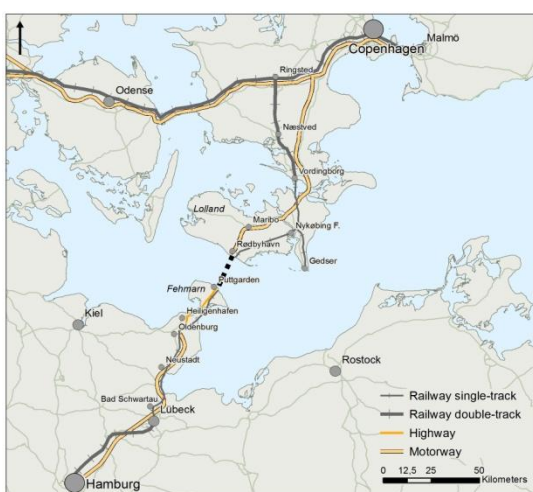


Fig. 1 Fehmarnbelt and areas nearby



Fig. 2 Fehmarnbelt, Puttgarden and Rødbyhavn

## 2. Project description

The fixed link across the Fehmarn Belt, 19 km long, is planned for establishment between Rødbyhavn (Lolland) and Puttgarden (Fehmarn) and will consist of a four-lane motorway and a two-track railway.

The 1999 Feasibility Study identified a number of feasible technical solution models. A cable-stayed bridge has been selected as the preferred solution, and an immersed tunnel as the preferred alternative.

The selection of the technical solution (bridge or tunnel) has not yet been made, nor has any decision on the precise alignment.

The construction work is expected to include excavation of up to 28 million m<sup>3</sup> of seabed material, depending on the technical solution. It will be possible to reuse some of this in the project, while the excess material would be deposited or reused in other ways. Finally, extraction of 3-5.3 million m<sup>3</sup> of sand will be used for construction work, possibly from separate sand extraction areas out at sea.

### **3. General EIA strategy for the fixed link across the Fehmarnbelt**

The purpose of EIA report is to study, describe and to assess the environmental impact from the fixed link on an early stage

The results from the preliminary investigations of the project which were carried out between 1996 and 1999 indicate that it is possible to establish the fixed link across the Fehmarnbelt and to operate this in a manner which is sound from an environmental standpoint. This is supported by experiences from the fixed links across the Great Belt and Øresund. However, there is a need, given the first preliminary investigations mentioned, for an extended and updated knowledge to allow final conclusions to be drawn. Therefore, the starting point for the environmental investigation is that all relevant problems relating to the environment must be examined thoroughly, on a firm scientific foundation and using the best methods possible (state-of-the-art).

The investigation programme will take into account both national and international legal requirements and applicable practice of off-shore projects, as well as road and rail projects on land. It is also based on the preliminary investigations and on the responses from the environmental consultation held: "A Fixed Link across the Fehmarnbelt and the Environment", dating back to 2006. This was reported by the Danish Ministry for Transport and Energy and the German Federal Ministry of Transport, Building and Urban Affairs.

#### Environmental investigations and EIA

The assessment of environmental impact will illustrate a range of alternative alignments and technical solution models, as well as what is known as the zero alternative, i.e. the future situation without a fixed link. Bridge and tunnel solutions will be illustrated on a comparable basis.

The precise structure of the link will be optimised as the environmental surveys progress. Environmental experts and construction engineers will work in close cooperation to identify solutions which may prevent or mitigate any adverse environmental impact. Most important is environmental optimisation of alignment, structure (design) and construction methods.

One example of design optimisation is the streamlining of bridge piers and pylons in order to reduce the effect of currents at sea. During the construction phase, the selection of excavation methods and arrangement of the work while taking into account biologically susceptible periods will provide effective prevention arrangements. The EIA report will assess the optimised alternatives.

In accordance with national and international requirements, the environmental assessments will illustrate the project's direct, indirect, cumulative, short-term and long-term, permanent and temporary impact upon the environment.

The *environment* is understood to mean humans, fauna, flora, soil, water, air, climate, landscape, material items and cultural heritage, as well as the interaction between these factors.

*Cumulative effects* are understood to mean the environmental impact from the fixed link, viewed in context with the environmental impact from other relevant projects and activities. Positive, adverse and cross-border impact on the environment will be assessed.

#### Method

The environmental surveys essentially consist of two elements; basic investigations, which describe the current environmental conditions in and surrounding the project area, and a description and assessment of the anticipated environmental impact.

Detailed basic surveys will be carried out on the basis of the best technology available, such as automated measuring buoys, flight-based surveys of bird and marine mammal numbers, radar surveys of bird migration and advanced modelling of currents and ecological links.

Correspondingly, assessments of the project's environmental impact will be based on a firm combination of expert assessments, focused effect studies and model calculations of the effects. The procedure for the assessment can be divided into four consecutive stages in which the following elements are assessed:

- The significance of relevant environmental factors or components.
- The susceptibility of the environmental factors or components to relevant effects.
- The nature and scope of the potential effects.
- The significance of the anticipated effects.

The assessments will result in a comparative analysis which gives priority to the various solution models on the basis of an environmental standpoint.

#### Survey area

To be able to assess the full geographical extent of the project's environmental impact, the surveys will focus on areas which are not in the immediate vicinity of the fixed link.

The survey area on land will extend a few kilometres around the approach facilities and cover the area where the fixed link could have an environmental impact.

At sea, the survey area will initially cover the Fehmarnbelt in its entirety, with adjacent Natura 2000 areas. However, in practice the size of the survey area will vary depending on which problems are encountered. For instance, potential changes in the water exchange with the central part of the Baltic Sea will be examined.

#### 4. Scope and content of the environmental investigations

The potential environmental impact during the construction phase is particularly expected to be related to the construction work itself, and therefore it is largely expected to be temporary in nature. The effects over the operating phase can be divided up into effects which are caused by the presence of the permanent structures for the facility and effects which are due to operation of the facility including traffic using the link. Below is a brief description of the basic surveys and the problems that will be assessed. These descriptions are partly divided in respect of the environmental factors that may be affected.

##### Humans (population)

On both Fehmarn and Lolland, there are small urban societies and rural towns near to the planned fixed link, but there are no major towns or industrial areas. The business structure on Fehmarn is dominated by tourism, ferry traffic and agriculture. On Lolland, the business structure is characterised primarily by agriculture and service companies, but ferry traffic and tourism are of significance here too.

The basic surveys will focus on the locations of homes, business premises and tourist facilities around the link and illustrate how tourists and permanent residents use the areas, including for recreational purposes. Existing environmental impact from traffic noise and air pollution, for example, will also be illustrated.

The assessments of the potential effects of the project will focus on human health and general wellbeing, including the chances of maintaining the existing business and recreational activities. The following main problems will be illustrated:

- the significance of noise, vibration, light and air pollution from construction activities and the later operation of the link, including any increase in traffic. The assessments will include effects on housing areas and the quality of recreational areas.
- Access to recreational areas and the quality of these as a consequence of temporary and permanent consumption of expanses of land and the presence of buildings and other permanent structures.
- The risk to humans in the event of any contamination caused by accidents.
- The significance of the visual changes to the landscape around the link.
- The significance of the effects of other environmental factors.

In accordance with the Danish rules, the assessments will also include any socioeconomic consequences for Danish sovereignty, resulting from the effects on other environmental factors. The significance for businesses such as fishing, tourism and agriculture is one example of this.

##### The maritime environment

The Fehmarnbelt is part of Bælthavet, which links the Baltic Sea with the Kattegat. Across Øresund, the waters consist of the straits of the Little Belt and Great Belt, as well as Kiel Bight and Mecklenburg Bight. At its deepest, the Fehmarnbelt is around 30 metres deep, and in the project area the width of the Belt varies between 18 and 25 km. The coastlines of both Lolland and Fehmarn are made up of sandy beaches which are often steep due to the installed coastal dykes which protect the low-lying hinterland.

The water quality in the Fehmarnbelt is affected by the nutrients introduced from the surrounding waters, and during storms the seabed is whirled around and impairs the transparency of the water. Due to strong currents and exposure to waves, rooted vegetation such as eelgrass, which provides places to live for invertebrates and small fish, is not typical of the Fehmarnbelt. However, there are large quantities of common mussels along the Lolland coast.

The most important fish are cod, flatfish, sprats and herring. Three varieties of marine mammal (porpoises, seals and grey seals) also visit the Fehmarnbelt area regularly.

The basic surveys will include depth and seabed conditions, the shape of the coast, hydrography (temperature, salinity and current), water quality, plankton, animals and plants on the seabed and habitats and the presence of fish, porpoises, seals and birds.

The assessments will include the potential effects of construction on water, earth (i.e. the seabed) and the flora and fauna, including biodiversity, with primary emphasis on the following issues:

- Excavation work and the effects of backfill on the seabed, animals and plants, plus the effect of seabed morphology and habitats for animals and plants
- The effect of sediment spillage on water quality, plant and animal life, both when the sediment is suspended in the water and again when the sediment is lying on the seabed.
- The potential disturbance of fish, marine mammals and birds from sailing, excavation work and other construction activities. Bridge piers and other permanent structures' alteration of the current through the Fehmarnbelt and alteration of the natural water exchange in the Baltic Sea. Bridge piers and other permanent structures' function as artificial reefs, which may mean a local increase in marine animal and plant life.
- Risk of collision among shipping, with potential impact on the marine environment.

### Bird migration

The Fehmarnbelt is located on two of Europe's major migration routes for birds. One is used by birds that live on land, which breed in Scandinavia and cross the Belt on their northbound and southbound migrations in spring and autumn respectively. This applies to many small birds and raptors. The other migration route is in an east-west direction across the Belt. This is used by a large number of water birds, i.e. geese, ducks and waders, which breed in Scandinavia and further east but which spend the winter in the Wadden Sea on the coasts of Denmark, Germany and the Netherlands.

The basic surveys will provide a comprehensive view of bird migration in the Fehmarnbelt. The environmental assessments will focus on whether a bridge link across the Fehmarnbelt may affect numbers of migratory birds by acting as a barrier which will delay the birds' migration or force them to change their route.



### Land environmental

The landscape and countryside around the approach and ramp areas in both Lolland and Fehmarn are dominated by flat, intensively cultivated agricultural areas. The urban societies of Rødby, Rødbyhavn and Puttgarden, along with a number of smaller country towns, are exceptions to this. However, along the coasts in particular are natural areas of varying kinds, such as the dyke along the Lolland coast and the underlying wetlands, as well as lagoons and marshy areas to the west side of Fehmarn. In the cultivated areas, there are hedgerows, ditches and numerous ponds which provide habitats for plants and animals such as insects, frogs and toads.

The basic surveys will focus on an area extending a few kilometres around the planned, ramps, access routes, etc. The surveys will chart and describe relevant geological conditions, plant and animal life, ground water, waterways, lakes and ponds, as well as the existing air quality.

The assessments of potential environmental impact will focus on the following issues:

- Direct impact on the soil, plant and animal life as a consequence of excavation work and construction.
- Physical changes to lakes, ponds and waterways (ditches) and ground water level.
- Temporary or permanent loss of, alteration to and splitting of habitats for animals and plants, including any effects of the link as a barrier to the movements of animals.
- Disruption to animal life as a consequence of construction activities, traffic and noise.
- The consequences of the link to the nature of the landscape.
- Local significance of changes to air pollution and any emissions and spillages of environmentally hazardous substances to the earth, ground water, ponds and waterways.

### Other environmental factors

The project will involve emissions of CO<sub>2</sub> from production processes and construction work and may also mean a change in future CO<sub>2</sub> emissions. The potential change in the emissions will be assessed in the EIA report. The environmental surveys will chart material items such as harbour facilities, buildings, wind farms, military facilities and deposits of mineral resources, and assess whether these will be affected by the project. The significance for shipping and air traffic in the area will also be assessed.

The project's effect on cultural heritage will also be assessed. Thorough preliminary archaeological surveys both on land and on the seabed will ensure, however, that known or as yet unknown finds will be documented, and, where necessary, excavated or salvaged so as to prevent anything from being destroyed.

## **5. Natura 2000 and specially protected species**

The designation Natura 2000 covers the European network of nature protection zones named in accordance with the EU's Birds Directive and Habitat Directive. The fixed link will pass through a Natura 2000 zone in German waters, and there are a number of Natura 2000 zones in the region

surrounding the link. In compliance with the legislation, independent assessments of each individual Natura 2000 zone will be carried out.

Annex IV to the Habitat Directive also includes a list of plant and animal species that are subject to particularly strict protection, no matter where they live. In compliance with the legislation, an independent assessment will take place in order to determine whether the project could harm such species. The effects on other protected or endangered species will also be assessed.