



# Environmental protection is an opportunity - We help to use it

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# About OECOS



## Profile

OECOS is a reliable partner for spatial planning and environmental studies. We focus on Spatial Analyses for Wind Site Development, Environmental Impact Studies, FFH Compatibility Studies, Landscape Envelope Plans and Special Species Conservation Studies in connection with project approvals or regional planning for many years. Furthermore, we are participating in a number of research and development projects that deal with the methodology of related investigations.

OECOS GmbH is resident in Hamburg and internationally active. The team works predominantly on an interdisciplinary basis, with geographers, biologists, landscape planners, in many cases with economists and jurists as well. Our team is also regularly commissioned for R&D projects in which we investigate innovative ways of sustainable development.

The managing director of OECOS GmbH is Prof. Dr. Karsten Runge. He is a member of the Hamburg architect chamber and represents the branches landscape planning and environmental assessment as an associate professor at the Leuphana University of Lüneburg.

#### Customers

OECOS GmbH commits itself to integrity, loyalty, reliability and fair play.

Our customers are:

- Ministries and authorities
- Research institutions
- Business companies
- Project developers
- Educational institutions
- Non Governmental Organisations



## Planning & Approval Documents

- Environmental Impact Studies in Regional and Landuse Planning Procedures
- Environmental Impact Studies in Plan Approval Procedures
- Strategic Environmental Assessments
- Habitats Directive Assessments
- Special Species Protection Assessments
- Landscape Envelope Plans

## **Mapping of Environmental Assets**

- Visual Landscape Analysis and Visualisation
- Biotope Mapping

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- Surveys of Breeding, Resting and Migrating Birds
- Surveys of Bats and specific Fauna
- Acceptance Analysis
- Surveys on Soil, Water, Air and Noise

## **Restriction Analyses & Regional Studies**

- Greenfield Analysis for Wind Site Development
- Analysis of Wind Site Development Potentials at the County Level
- Forecasts of Offshore Wind Energy Distribution
- Spatial Analysis of Repowering Potentials concerning Windfarms onshore

## **Research & Development Studies**

- Guidelines on Strategic Environmental Assessment in the EEC
- Environmental Impacts of 380 kV Underground Cables
- Environmental Impacts of Climate Adaptation
- Environmental Impacts of High-Volume Hydraulic Fracturing
- Subterranean Regional Development Planning











# Environmental Studies in Wind Energy Planning



## Large-scale Analyses of Potential

OECOS GmbH has conducted large-scale GIS research activities to assist numerous renowned wind energy project developers in determining low-conflict locations for wind power plants. Most of these studies are based on specific regional spatial planning programmes and are complemented by a great many updated basic maps. OECOS has performed large-scale analyses of potential in numerous administrative districts, thus gathering extensive experience in avoiding impairments of the environment and conflicts of use.

## **Assessment of Environmental Factors**

The approval process for wind farms involves detailed location assessments regarding breeding, resting and migrating birds which OECOS performs according to regionally applicable method standards. OECOS also professionally documents other important environmental factors such as fauna, flora, biotope types and the quality of the natural scenery, and discusses them in the context of detailed assessments. All results are presented accurately in maps and analysed precisely with the aid of GIS software (ArcGIS 10, AutoCAD 2010). When necessary, photographic visualisations are generated to evaluate the impacts of the wind power plants on the natural scenery.

## **Preparation of the Environment-related Permit Documents**

A number of specific environmental documents must be submitted to receive a permit for operating a wind farm. Depending on its size, a location-related preliminary examination of the specific case or an environmental impact assessment must be submitted pursuant to the Environmental Impact Assessment Act (UVPG). Moreover, the Federal Nature Conservation Act (BNatSchG) stipulates that the construction of wind power plants is an intervention in nature and landscape. Consequently, the preparation of a landscape envelope plan and of a guidance document on the strict protection of species is required in Germany. OECOS GmbH possesses many years of experience in preparing all these documents which are mandatory for the permit process in Germany and other countries.



# **Environmental Review of Infrastructure Projects**



The preparation and gathering of environmental documents in the context of permit procedures for major projects is one of the core competencies of OECOS GmbH. Here are two pertinent examples:

## **Port Expansion**

In addition to many minor projects, OECOS GmbH was commissioned by the Hamburg Port Authority (HPA) to prepare the environmental documents for the planned construction of the Central Terminal Steinwerder (CTS). The extensive environmental studies required for this project were conducted by OECOS, partly in-house and partly by external experts. They took the conditions of the natural space of the areas of the terminal and of the harbour basins into account. Due to the large number of different environmental factors, many specific individual expert opinions and outcome studies had to be prepared. In addition to drafts for the Environmental Impact Assessment (EIA) and the Landscape Envelope Plan (LEP), a Special Species Protection Assessment (SPA) concerning the prohibitions to interfere according to art. 44 cl. 1 BNatSchG as

well as a preliminary Habitats Impact Assessment according to art 6 cl. 3 SCI Guidelines and art. 34 BNatSchG concerning the conservation sites of the European Natura 2000 network were conducted along the Elbe River.

## **Traffic Route**

HafenCity is a new and central urban quarter of Hamburg, arising in parts of the historic harbour at the Elbe River. Developing the eastern HafenCity district in Hamburg necessitates the extension of the underground line U4. In the wake of the plan assessment procedure, OECOS GmbH was commissioned by Hamburger Hochbahn AG (HHA) to conduct an Environmental Impact Assessment (EIA), a Species Protection Assessment as well as the preparation of a Landscape Envelope Plan.

Numerous ecological prestudies required for the Environmental Impact Assessment were conducted in-house, and other partial examinations were assigned to external experts.

# Mapping and Ecological Monitoring



#### **Mapping Flora and Fauna**

OECOS GmbH performs a number of biological assessments with its own staff and sometimes also with the aid of acknowledged specialists. Often maps of the home ranges of breeding birds must be produced during project planning phases. In complementary recordings of migrating birds which are necessary as the case may be, not only the species, number and migrating direction of the individual birds are documented, but also and especially their flight altitude. Often bats, amphibians and/or reptiles are also recorded. While floral mapping is usually restricted to the recording of biotypes, more specific, seasonal recordings are also possible.

## **Ecological Monitoring of diverse Construction Sites**

Ecological construction monitoring ensures continuous and technically competent environmental on-site protection during the construction of major projects. In addition, in ecological construction supervision, the observance of nature conservation interests is ensured, compensatory measures are documented and unnecessary delays during construction works are avoided.

50 Hertz Transmission GmbH is the transmission system operator who is responsible for the grid connection of wind farm projects in the German Baltic Sea. In 2012 OECOS GmbH was commissioned by 50 Hertz with the ecological construction supervision of the laying of the "Baltic 2" cable connection into the seabed to ensure that the natural and environmental concerns were heeded. Through the use of qualified personnel with appropriate environmental knowledge and sufficient experience in the ecological monitoring of construction it acts in the planning and implementation, and assists the construction management in nature protection issues and in obtaining permits. OECOS performs Habitats Directive Assessments and Species Protection Assessments and balances daily environmental impacts, which are defined in the context of nature conservation impact regulations.



# Research & Development Projects



## **Environmental Impacts of Construction and Operation of Grid Lines**

The expansion and new construction of high voltage lines is currently a much discussed issue. OECOS was involved in various R&D projects on the environmental impact of extremely high voltage lines. For example, we prepared the study "Ökologische Auswirkungen von 380-kV-Erdleitungen und HGÜ-Erdleitungen" (Ecological impact of 380 kV earth connections and HVDC earth connections) in cooperation with the Energy Research Centre of Lower Saxony (technical, economic and legal aspects) for the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety.

OECOS also worked in a consulting capacity concerning the potential environmental impact of extremely high voltage overhead transmission lines and cables (three-phase and direct current) at the behest of the German Federal Network Agency (FNA). The report "Umweltauswirkungen unterschiedlicher Netzkomponenten" (Environmental impact of different grid components) served as a preliminary study of the Strategic Environmental Asssessment 2012 for the Federal Requirements Plan for High Voltage Transmission Networks.

The results of the projects are being further developed and continuously published in additional R&D projects. Most recently an article was published in the German Environmental Impact Assessment Handbook (HdUVP).

## **Environmental Impact of Underground Pumped Storage**

As part of a research project on "Wind energy storage through re-use of disused mines" OECOS identified critical points from the environmental perspective. The study was written for the Energy Research Centre of Lower Saxony (EFZN) as a subcontractor of the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU). The aim is to investigate the potential of abandoned mines for subsequent use as underground pumped storage power plants. Special attention should be paid to the possible remobilisation of pollutants deposited in deep water and the resulting potential construction and operational impacts on the water balance.

Further R&D projects are in progress.



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## Do you have any questions? Please do not hesitate to contact us.