

# BSG | ecology

## Project Profile

### European Electricity Transmission Schemes: Spatial Analysis And Ecological Support

#### Overview

BSG Ecology provided ecological and spatial analytical support to the European Network of Transmission System Operators for Electricity (ENTSO-E) in their cost-benefit analysis of 150 proposed electricity transmission schemes across thirty-six European countries. BSG's study compiled environmental and social sensitivity information in a spatial database to inform ENTSO-E's ten-year network development plan.

#### Challenge

ENTSO-E's development plan required a cost-benefit analysis to identify potential sensitivities along these projects' routes and where problems might arise during build-out. The output of this analysis needed to be an easy-to-interpret dataset of areas that are particularly sensitive to environmental and social impacts within a survey area encompassing 36 European states. This dataset would have to classify potential impacts by scale and account for electricity transmission schemes that were still in the route optioning phase.

#### Solution

In consultation with ENTSO-E, BSG Ecology identified the range of environmental and social impacts. A methods document was prepared outlining the national and EU legislation underlying these impact sensitivity areas.

BSG Ecology then carried out a desk-based study to collate the relevant cross-Europe datasets for areas with sensitivities to social impacts (UNESCO World Heritage Sites and their mandated buffer zones, densely populated NUTS3<sup>1</sup> regions, areas in proximity to schools) and areas with sensitivities to environmental impact (Natura 2000 sites, Ramsar sites, Emerald Sites, IUCN Key Biodiversity Areas and other areas protected under national law).

These datasets were processed in ArcGIS, documenting source and date with relevant INSPIRE metadata. It was determined that a central PostGIS spatial database for these sensitivity areas would be more appropriate for large scale analysis than a conventional desktop system such as ArcGIS.

The project routes were then entered into this database. For projects where the exact route had not been established, reasonable bands/ranges were defined that would allow the impact to be evaluated.

A geographical intersect query was then carried out to indicate the amount of each route which ran through each sensitivity area, classified by member state and type of impact. To confirm accuracy, selected sample distances from the output were then checked against the routes in ArcGIS.

An interactive table was prepared from this data to provide a clear and meaningful way for non-specialists to interrogate the results, identify individual projects, and evaluate the scale of predicted residual impacts. A simple user guide and individual information links were also prepared and included with the dataset for users within ENTSO-E and transmission system operators, along with a cleaned and appropriately documented version of the database itself.

#### The Outcome

The ten-year network development plan was presented to the European Commission and the results of the analysis shared with ENTSO-E's members and transmission scheme stakeholders. The findings have been incorporated into the advanced designs of several routes to minimise unmitigatable social/environmental impacts and allow costs to be internalised/accounted for at an earlier stage than they might otherwise be.

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<sup>1</sup> NUTS3: 'Nomenclature of Territorial Units for Statistics', the third level of administrative divisions of countries for statistical purposes

