Supplementary Information Report
Topolog-Luminita-Mesteru
Wind Farm, Romania

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Land Power

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Date:
October 10, 2013

Project Number:
IT1000957

ENVIRON

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Appendices

1 Introduction

LUKERG Renew (LUKERG-R or the Parent Company) has been developing a wind farm near Luminita, Topolog and Mesteru village, in the Tulcea County in the north of the Dobrogea Region, in Romania (hereafter the Project). The development of the project was originally initiated in 2006 by Land Power (Land Power or the Company) and LUKERG-R acquired the permitted development projects. Since December 2012, Land Power is the Romanian Company as 100% owned subsidiary of LUKERG Renew.

During the environmental permitting, two EIAs were undertaken due to the evolution of the environmental Romanian regulation:

1. the first EIA application (2008 EIA) was undertaken for the whole wind farm and submitted to the Competent Authorities (Environmental Protection Agency of Tulcea County – hereinafter EPA) which issued 3 Environmental agreements respectively 2 for both clusters of Luminita and Mesteru in November 2008 and 1 for Topolog cluster in February 2009;
2. the second one (2010 EIA) was undertaken on a voluntary basis by Land Power consequently to the entry into force of a new National regulation (GD 445/2009 - *Governmental Decision no. 445/2009 on establishing the framework procedure for the environmental impact assessment for certain public and private projects*). EPA closed the authorization process revising the 3 existing Environmental agreements (issued for 2008 EIA process) on December, 9 2010 and issuing a single Environmental Agreement for the whole wind farm on November 12, 2011.

The wind farm falls in Natura 2000 sites, i.e. Babadag Forest SPA and North Dobrogea Plateau SCI, therefore, on the basis of MO 19/2010 (*Approving the Methodology on the Appropriate Assessment of plans and projects with potential effects on natural protected areas of Community interest (Natura 2000 sites)"*), in 2010 an Appropriate Assessment Study was submitted to EPA (to date, there are not yet specific Authorities/Organizations for the management of these Natura 2000 sites) to evaluate potential impacts on nearby two Natura 2000 sites (11 turbines were located within Natura 2000 sites at the time of the Appropriate Assessment Study submission – recently one turbine (T01) was abandoned due to recent optimizations of the project). Although no single permit was issued for Appropriate Assessment Study, it is noted that the 2010 EIA Study included the evaluations and the results of the Appropriate Assessment Study, so the final EIA permit issued by EPA covered also the contents of the Appropriate Assessment Study.

To date, the Project has obtained the required permits and authorizations including building permits, environmental permits and authorizations.

LUKERG Renew is seeking financing for the project from the European Bank for Reconstruction and Development (EBRD). In line with EBRD performance requirements, the project have been assessed against the Banks' environmental and social policy requirements and EU legal requirements, resulting that:

- no landscape and visual impacts assessment was provided in two EIA reports, therefore supplementary analyses supported by photo renderings of the wind farm, also taking into account the cumulative effects with other existing projects, were considered as necessary;

- no comprehensive compliance with the criteria of the EU Habitats Directive was showed in the existing Appropriate Assessment of 2010 with regard to the ecological baseline and the impacts evaluation on birds and bats. As consequence, additional studies were required to meet the EU requirements on the protected species.

The overall supplementary information are therefore presented in this report that is part of the ESIA disclosure package for public consultation of the project, along with the original Romanian environmental reports i.e. the two EIA reports and the Appropriate Assessment study, and the new documents, i.e. the Additional Study on birds and bats, the Environmental and Social Action Plan (ESAP), Stakeholder Engagement Plan (SEP) and Non-Technical Summary (NTS).

The supplementary investigations confirm that:

- the proposed wind farm, with the implementation of suggested mitigation measures, will not adversely impact upon the local landscape character beyond the local context;
- given the wind farm layout and the location of the wind farm in a peripheral area of migration fly route, and considering the proposed mitigation/compensation measures, the farm it is not expected to contribute towards a significant residual or cumulative effect upon birds and the integrity of adjacent Natura 2000 site. Additional monitoring will be undertaken throughout the project cycle to verify the effective of the mitigation measures. Regarding the bats, the wind farm site is characterized by a low density of bat populations and therefore impacts on bats species are not anticipated to be significant, however proper mitigation measures will be also implemented.

1.1 Structure of report

After this introduction, this report provides:

- a brief overview of the project considering a recent modification of the project layout and the last programme of works construction;
- an assessment of the landscape visual impact assessment through the production of a zone of theoretical visibility map and photomontages along with the cumulative landscape impacts considering other existing wind farms;
- a summary of the Additional Study, prepared by AS ORIMEX (Romanian consultant of Land Power which have elaborated the existing Appropriate Assessment), regarding the ecological baseline and impacts evaluation on birds and bats;
- the overall conclusions about the supplementary information of the project discussed in this report.

2 Project details

The wind farm will be located in the Tulcea County, in the north of the Dobrogea Region, about 50 km west of the Black Sea cost and about 40 km South-West of Tulcea city. As already described, the wind farm will be located near Luminita, Topolog, Mesteru and Dorobantu villages. It is noted that Luminita is a part of Topolog municipality and Mesteru is a part of Dorobantu municipality.

The wind farm site is accessed via the road DJ 411 (222B), which connects Dorobantu and Topolog, and other existing roads (De 602, 561, 606, 615 and 616) within the area.

The project is divided into 3 clusters, namely Mesteru (16 turbines – ME), Luminita (11 turbines – LU) and Topolog (15 turbines – TO).

The Project has a total installed capacity of 84 MW, comprising 42 wind turbines of 2 MW each. Each wind turbine is 150 m tall (105 m tower plus 45 m rotor blade above the tower height). Due to recent optimizations, the development of the turbine T01 (inside the SCI area) was abandoned and consequently the number of the turbines reduced from 42 to 41. According the final layout, respectively 10 turbines (LU03 - LU011 and ME08) are located within the SCI Podişul Nord Dobrogean and one of them (ME08) within the SPA Padurea Babadag (i.e. the turbine ME08 is located both in the SCI and in the SPA, since part of the Padurea Babadag SPA is also designated as a SCI).

After the abandonment of the turbine TO1, Land Power started the development of a new turbine located outside the Natura 2000. The process is on-going.

The location of the turbines and thebounderies of the Babadag Forest SPA and North Dobrogea Plateau SCI are reported in Figure 1.

The turbines will be connected to a new 30/110 kV sub-station (Topolog sub-station) by 36 km underground electrical cables of medium voltage (30 kV). The cables routes will run in the roadside verges (existing roads or new roads to be built for the wind farm) to minimize disturbance to agriculture and pasture. The Topolog sub-station will be connected by a 110 kV underground power line to the existing 400-110 kV Rahman station. The 110 kV power line will be a length of about 15 km and, with the exception of the first kilometer, it will run in the verge beside the national road DN 701 (22A) until it reaches the Rahman station.

The comprehensive map of the updated project layout is reported in **Appendix 1**, showing the location of each of the components of the wind farm.

2.1 Project scheduling

A programme for implementation of the project detailing the estimated length of time and start and finish dates for construction is shown in the **Figure 2**.

The normal lifetime of the turbine is approximately 20-25 years, when the decommissioning will follow.

Figure 1: Wind turbines layout map showing the SCI and SPA protected areas

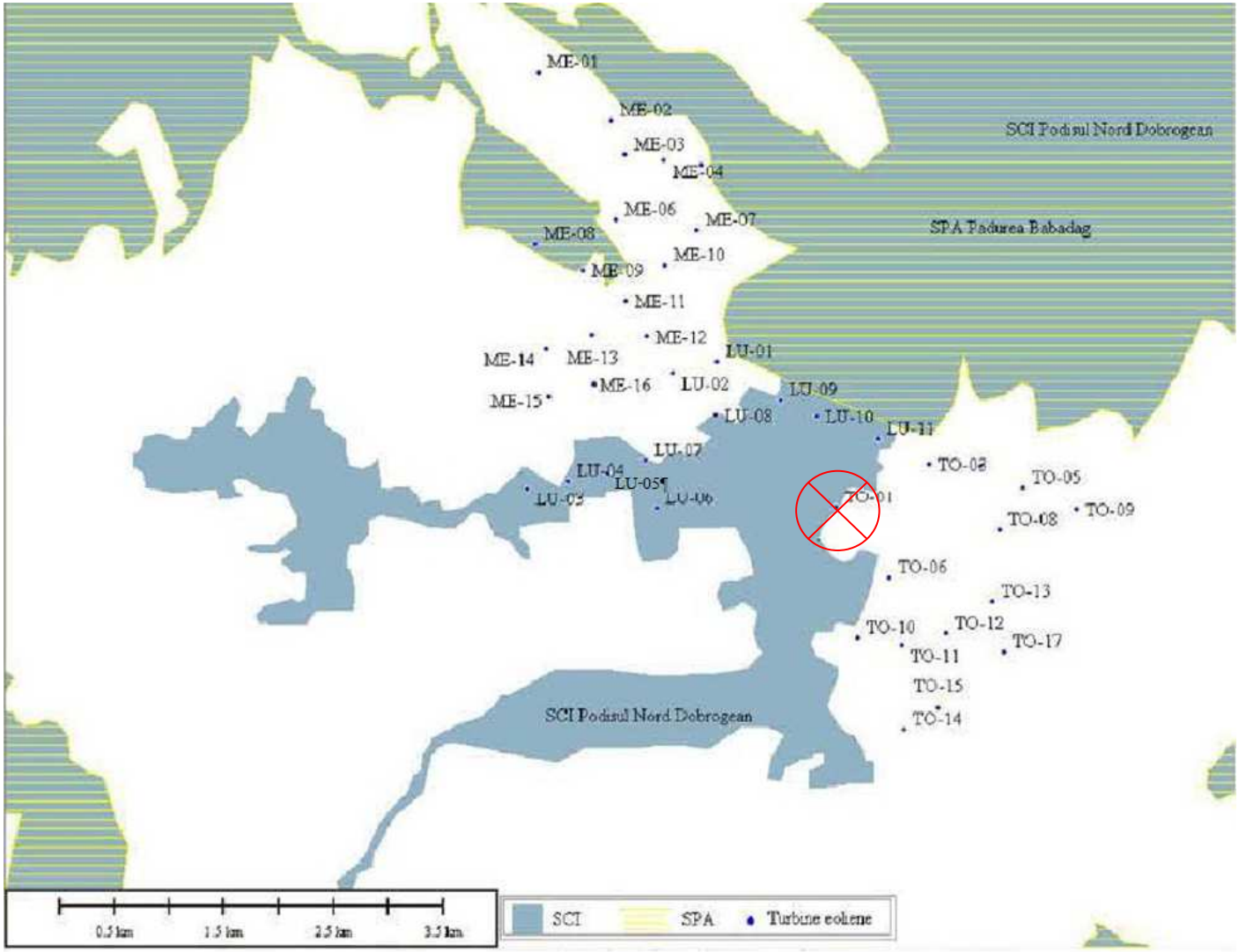
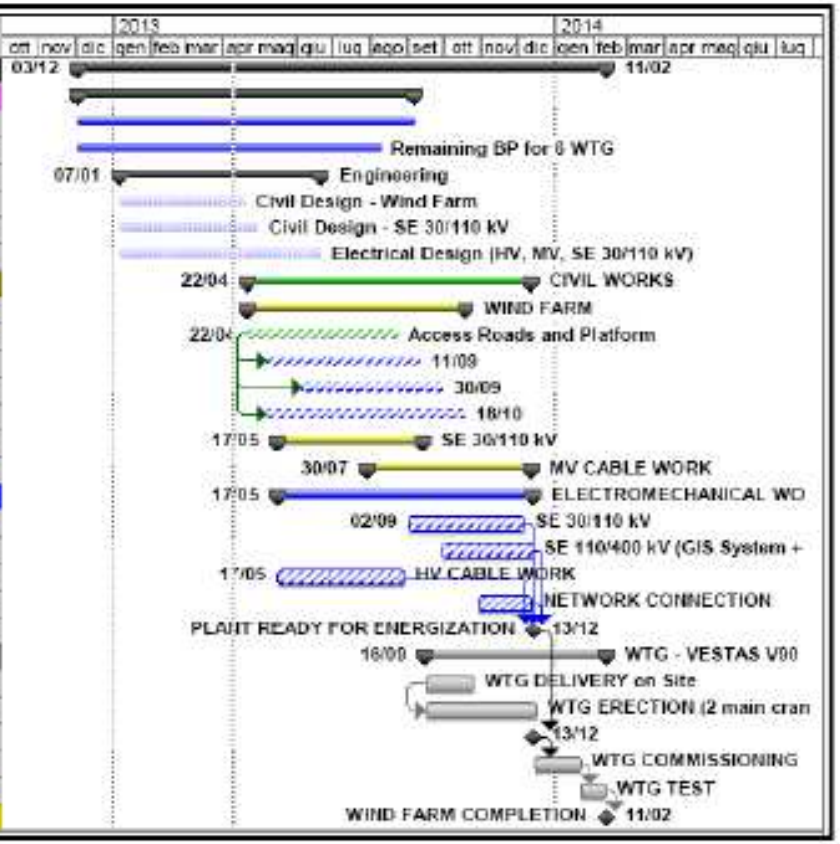


Figure 2: Construction programme

Nome attività	Inizio	Fine	Nomi risorse
DTL WIND FARM - GENERAL PLANNING OF CONSTRUCTION	lun 03/12/12	mar 11/02/14	
PRELIMINARY ACTIVITIES	lun 03/12/12	ven 06/09/13	
Authorizations, Permits, Communications	lun 03/12/12	ven 06/09/13	
Remaining BP for 6 WTG	lun 03/12/12	ven 09/08/13	
Engineering	lun 07/01/13	ven 21/06/13	
Civil Design - Wind Farm	lun 07/01/13	ven 19/04/13	STRABAG
Civil Design - SE 30/110 kV	lun 07/01/13	mar 30/04/13	ABB
Electrical Design (HV, MV, SE 30/110 kV)	lun 07/01/13	ven 21/06/13	ABB
CIVIL WORKS	lun 22/04/13	mar 11/12/13	
WIND FARM	lun 22/04/13	ven 18/10/13	
Access Roads and Platform	lun 22/04/13	ven 23/08/13	STRABAG
ME Foundations - 17 WTG	mer 08/05/13	mer 11/09/13	
LU Foundations - 9 WTG	gio 06/06/13	lun 30/09/13	
TOP Foundations - 16 WTG	mer 08/05/13	ven 18/10/13	
SE 30/110 kV	ven 17/05/13	ven 13/09/13	ABB/Energobit
MV CABLE WORK	mar 30/07/13	mer 11/12/13	STRABAG
ELECTROMECHANICAL WORKS	ven 17/05/13	ven 13/12/13	
SE 30/110 kV	lun 02/09/13	ven 06/12/13	ABB/Energobit
SE 110/400 kV (GIS System + TRAFO)	lun 30/09/13	ven 13/12/13	ABB
HV CABLE WORK	ven 17/05/13	gio 29/08/13	ABB/Energobit
NETWORK CONNECTION	mer 30/10/13	gio 12/12/13	ABB
PLANT READY FOR ENERGIZATION	ven 13/12/13	ven 13/12/13	
WTG - VESTAS V90	lun 16/09/13	mar 11/02/14	VESTAS
WTG DELIVERY on Site	lun 16/09/13	ven 25/10/13	
WTG ERECTION (2 main cranes)	lun 16/09/13	lun 16/12/13	
WTG First Energization	ven 13/12/13	ven 13/12/13	
WTG COMMISSIONING	lun 16/12/13	mar 21/01/14	
WTG TEST	mer 22/01/14	mar 11/02/14	
WIND FARM COMPLETION	mar 11/02/14	mar 11/02/14	



3 Landscape and visual impact assessment

This section presents the supplementary work relating to the results of the assessment of visual impacts landscape of the Topolog-Luminita-Mesteru wind farm, as recommended in the due diligence report. Effects due to the wind farm development upon landscape character and visual amenity was considered, including effects upon potential viewers and viewing groups caused by a change in the appearance of the landscape as a result of the development.

Landscape character is considered to be of importance in its own right and is valued for their intrinsic qualities regardless of whether they are seen by people.

The development is analyzed to identify the elements of the proposed wind farm with the potential to cause effects on the landscape and/or visual amenity of the surrounding area.

The landscape visual impact assessment was carried out only for the wind farm operation because this is considered the most critical phase with respect to the long-term modifications on the landscape.

Finally, cumulative landscape impacts were evaluated considering other wind farms already existing in the same area of the project.

3.1 Methodology

The landscape visual assessment has involved desk study, field work, data processing and analysis and interpretation using professional judgment.

The assessment of the potential impacts on the landscape character and the visual amenity in the project area and in its surrounding is based on the practice principles contained within the following guidelines:

- *Guidelines for Landscape and Visual Impact Assessment*, Second Edition, Landscape Institute and Institute of Environmental Management ad Assessment, 2002;
- *Visual Assessment of Windfarms: Best Practice.* Scottish Natural Heritage, 2002;
- *Visual Representation of Wind Farm,* Good *Practice Guidance*, Scottish Natural Heritage, 2007;
- *Environmental Health, and Safety Guidelines for Wind Energy*, IFC, World Bank Group;
- *Use of Photography and Photomontage in Landscape and Visual Assessment* – Landscape Institute Advice Note 01/09 – Landscape Institute Technical Committee, February 2009.

The assessment is carried out through the following key steps:

- a Zone of Theoretical Visibility (ZTV) map was generated for the Topolog-Luminita-Mesteru wind farm to identify the potential extent of wind farm's visibility over the 25km radius study area;
- main viewpoints across the ZTV were selected as representative of the range of views and types of viewers likely to be affected by the project;

- photomontages of the wind farm development from selected viewpoints were elaborated to predict operational views of the proposed turbines from each of the agreed viewpoints.

In the following sections, methodologies and methods used for the landscape visual impact assessment are explained.

3.1.1 Illustrative tools: Zone of Theoretical Visibility and Photomontages

In order to assist in evaluating the potential landscape and visual effects arising from the proposed wind farm, a Zone of Theoretical Visibility (ZTV) map was generated to identify the potential extent of wind farm's visibility over the 25km radius study area.

A Zone of Theoretical Visibility identifies and maps the area within which a proposed development might have an influence or an effect upon the visual environment.

A maximum 25 km area from the center of the wind farm was chosen for the ZTV for Topolog-Luminita-Mesteru plant on the basis of the sizes of the wind farm and consistently with the principles contained in the reference documents.

The ZTV presented in this document was used as a tool to indicate the extent of the maximum theoretical visibility of the blade tip of the wind turbines. It is based on Ordnance Survey (OS) digital terrain data supplied as gridded height data at 50m interval resolution and was superimposed on an OS base map at 100,000 scale as suggested by SNH Guidance (2002).

The ZTV is theoretical because it does not take account of intervening of both artificial and natural obstacles, such as shelterbelts, trees, built structures or minor changes in topography (it should be noted that the Digital Terrain Model –DTM- is based on a 50m survey grid and so interpolated levels between grid points can be inaccurate in the foreground on rare occasions). Where these obstacles intervene between the viewer and the wind farm then this local screening could reduce the visibility of the project.

Furthermore, actual human perception is affected by the acuity of the human eye. In good visibility (visibility is meteorologically defined as the greatest distance at which an object in daylight can be seen and recognised), a pole of 100 mm diameter will become difficult to see at 1 km and a pole of 200 mm diameter will be difficult to see at 2 km. In addition, mist, haze or other atmospheric conditions may significantly affect visibility (Hill et al, 2001).

An assessment of the predicted visibility of the wind farm in the study area has been carried out and a selection of three viewpoints was chosen by analyzing the ZTV and verifying the findings during field reconnaissance. These viewpoints are considered to be representative of the main sensitive receptors in the study area.

Parameters considered during selection of the viewpoints included:

- Types of receptor: e.g. to include landscape character types most likely to be affected; designated landscapes, historic gardens and designed landscape, settlements, roads, marked footpaths; marked viewpoints; picnic areas and beauty spots and outdoor passive recreational locations;
- Distance from the wind farm;

- Direction from the wind farm with the aim of achieving a distribution from different compass points around the site; and
- Altitude.

Analysis of the potential effects on landscape and visual amenity arising from the proposed wind farm at each of these viewpoints has been carried out. This analysis has involved the production of photomontages to predict the operational views of the proposed turbines from each of the agreed viewpoints.

Photomontages have been prepared based on combining a wireline and/or 3D image of the predicted view with the photograph of the existing view and rendering the image using a model of the proposed wind turbines, also generated electronically. The resulting images should be viewed at a distance of 300mm to most closely replicate the view which would be obtained from the viewpoint. This is consistent with current best practice guidance *Visual Representation of Windfarms, Good Practice Guidance* (Scottish Natural Heritage, 2007).

Site photographs were taken during field surveys with a Digital Single Lens Reflex (SLR) camera with a 50mm lens, which conforms to the guidance provided in the Landscape Institute Advice Note 01/09 – Use of Photography and Photomontage in Landscape and Visual Assessment (Landscape Institute Technical Committee, February 2009), because this lens size is considered to most closely represent the view obtained by the human eye.

For each viewpoint, individual photographic frames were combined into panoramas.

The existing and predicted views from each of these viewpoints have been analyzed to identify the magnitude of change and the residual impacts on landscape character and visual amenity.

Finally, an assessment of the significance of the potential effects has been carried out to determine the impact of the wind farm in this locality in relation to landscape and visual amenity. The significance of a landscape or visual effect is a function of the sensitivity of the affected landscape or visual receptor, and the magnitude of change that will occur as a result of the proposed wind farm, as described in detail in the following paragraph.

3.1.2 Assessment methodology of the significance of landscape visual impacts

No established, measurable technical thresholds of significance exist for landscape and visual impacts. Wherever possible, identified impacts are quantified but the nature of landscape and visual assessment requires interpretation by professional judgment.

In order to provide a level of consistency to the assessment, landscape sensitivity to change, the prediction of magnitude of impact and assessment of significance of the potential effects has been based on pre-defined criteria. These criteria are set out in **Table 1** and following these the level of significance of impact is described as being *not significant, minor, moderate* or *major.*

Table 1 - Levels Significance of Visual Impacts

			Magnitude of Change in View caused by Proposed Development			
			Imperceptible	Small	Medium	Large
			Change which is barely visible, at very long distances, or visible for a very short duration, perhaps at an oblique angle, or which blends with the existing view.	Minor changes in views, at long distances, or visible for a short duration, perhaps at an oblique angle, or which blends to an extent with the existing view.	Clearly perceptible changes in views at intermediate distances, resulting in a either a distinct new element in a significant part of the view, or a more wide ranging, less concentrated change across a wider area.	Major changes in view at close distances, affecting a substantial part of the view, continuously visible for a long duration, or obstructing a substantial part or important elements of view.
Sensitivity of Viewpoint	Low	Small numbers of visitors with interest in their surroundings. Viewers with a passing interest not specifically focussed on the landscape *eg* workers, commuters. The quality of the existing view, as likely to be perceived by the viewer, is assessed as being low	Not significant	Not significant	Minor	Minor to moderate
	Medium	Small numbers of residents and moderate numbers of visitors with a interest in their environment. Larger numbers of recreational road users. The quality of the existing view, as likely to be perceived by the viewer, is assessed as being medium	Not significant	Minor	Moderate	Moderate to major
	High	Larger numbers of viewers and/or those with proprietary interest and prolonged viewing opportunities such as residents and users of attractive and well-used recreational facilities. The quality of the existing view, as likely to be perceived by the viewer, is assessed as being high	Not significant	Minor to moderate	Moderate to major	Major

This table is a guide only. The descriptions of levels of magnitude and sensitivity are illustrative only. Each case is assessed on its own merits using professional judgement and experience, and there is no defined boundary between levels of impacts.

3.2 Existing landscape character

The following figures show the characteristic of the landscape in the project site and in the surrounding areas.

The site area features a rolling hilly landscape, with gentle slopes east-west oriented, and rocky plateaus. In the surrounding areas of the project site, evidence of erosion processes by rainwater runoff was observed, although the presence of a continuous steppe vegetation indicates that the erosion processes are somewhat stable or now slowed down.

Land cover and land use throughout the greater area are dominated mainly by a mixture of agriculture and grazing. Within the wind farm site, the land use is predominantly agricultural. Main crops include corn, cereals and sunflowers. No other crops of economic value were identified during the site visit (it is to be noted that the site visits were carried out in autumn and in winter, therefore the presence of small areas utilized –in spring and summer- for the production of vegetables cannot be excluded). Land use is fragmented and intensive agricultural practices are limited. Grassland areas dedicated to livestock feeding and grazing were also present, at places provided with improvised fence enclosures.

In the non-cultivated areas, grassland synanthropic vegetation and more natural like steppe are predominant and isolated areas of shrub vegetation are present in the rainwater drainage channels.

The site's north-eastern boundary is defined by forest land. In the transition zone between the pasture and the forest land, a mixture of woodlands and grazing areas is present.

The villages of Topolog, Luminita, Mesteru and Dorobantu are present in the areas surrounding the project site. In particular, Luminita is a part of the Topolog municipality and

Mesteru is a part of the Dorobantu municipality. Topolog is the biggest village, as specified below. These villages occupy only a small percentage of the whole territory. No isolated houses are present. Villages mainly comprise small houses that are rural in character and generally have their own garden (in some cases used as kitchen gardens) and a shelter area for animals.

Communication between villages is guaranteed by public roads. The county road DJ411 (222B) connects Dorobantu and Topolog, passing through Mesteru and Luminita. The national road DN 701 (22A) connects Topolog to Rahman substation.

Figure 3: Landscape in the project area – narrow valleys with shrub vegetation

Figure 4: Landscape in the project area – grazing areas

Figure 5: Landscape in the project area – agricultural areas (examples of intensive agricultural lands)

Figure 6: Landscape in the surroundings areas of the project site (in forefront, examples of traditional land uses, with territory fragmentation)

Figure 7: Grazing areas in the project site

Figure 8: Landscape in the project area: existing transmission power lines in the background the turbines of the existing TOTAL ELECTRIC (ENEL) wind farm

Figure 9: Rainwater drainage channels and shrub vegetation in the surrounding areas

3.3 The project

The description of the project is reported in Section 2, while in the following additional information is indicated, as useful for the landscape visual assessment.

The project will cover an area of approximately 497 ha and shows the following altitude: 150m Mesteru, 197m Luminita and 215m Topolog. The wind farm site is accessed via the road DJ 411 (222B), which connects Dorobantu and Topolog, and other existing roads (De 602, 561, 606, 615 and 616) within the area.

The proposed turbines will be scattered in a random pattern across an open agricultural landscape, but in close proximity to the existing TOTAL ELECTRIC (ENEL) Wind Farm (11 operational turbines), as shown in the figure below. For the purpose of this assessment, a cumulative assessment was conducted considering also the existing ENEL Wind Farm.

The location of the proposed project (in red) and the existing ENEL wind farm (in blue) is showed in **Appendix 1**.

3.4 Impacts on the landscape character and visual amenity

3.4.1 Analysis of the Zone of Theoretical Visibility

A ZTV map has been also prepared to assist the visual assessment showing the theoretical visibility of the turbines within an area covering 25 km radius from the center of the wind farm project. This ZTV shows areas from where at least one turbine of the wind farm up to the 150m overall height may be visible. This is presented in Figure 2 in the **Appendix 2**.

An analysis of the ZTVs is provided below which explains the extent to which the proposed turbines would theoretically be visible from the study area and the nature and location of the receptors likely to be affected. In detail:

- the nearby villages of Topolog, Luminita, Mesteru, Magrule etc. However, given that there are valleys (drainage and erosion lines) within the surrounding topography some of the nearby communes will not be able to get views of the wind turbines especially most residence of Fantana Oilor and Calfa;
- the roads linking the villages, such as the county road DJ411 (222B) connecting Dorobantu and Topolog, passing through Mesteru and Luminita, the national road DN 701 (11) connecting Topolog to Rahman substation, and
- in the north and east the visibility of the proposed turbines extends to a distance of around 5km from the site and then becomes more fragmented due to the presence of the valleys beyond the mountains located around the site.

It should be noted that the project site is bounded by forest land on the north-eastern side. In fact, although ZTV map shows large areas where is predicted visibility to the north-east and north, this quadrant has significant large scale forest coverage where field reconnaissance suggests that the views are obstructed by the woodlands. As detailed in the following, no photographs were taken from anyone viewpoint on north-east during the site visit due to the screening action of the woodlands.

3.4.2 Receptors location and visualisation

Visual amenity receptors are defined as individuals or groups of people who may have views of the wind farm. In the context of this wind farm, the main groups of visual receptors are defined as follows:

- residents of the nearby villages of Topolog, Luminita, Mesteru;
- road users on road linking the villages,
- farmers and agricultural workers which frequents the areas.

There are no areas of high landscape value, heritage sites, scheduled ancient monuments, listed buildings, etc. within or in the surrounding area of project site. With respect to conservation protected areas, respectively 11 turbines (LU03 - LU011, TO01, ME08) are located within the SCI Podişul Nord Dobrogean; one of them (ME08) is also located within the SPA Padurea Babadag as well (the turbine ME08 is located both in the SCI and in the SPA, since part of the Padurea Babadag SPA is also designated as a SCI), however these areas are characterized by agricultural and grazing lands without particular significance in sensitivity.

It is acknowledged that these groups may be sub-divided and that there may be more categories of receptors, but for the purposes of the assessment, it is considered that the above categories cover the main groups of landscape and visual receptors.

The following table identifies the selected viewpoints to represent the range of opportunities which people will have to see the development from different types of location, altitude, distance and directions. These 3 selected viewpoints allowed to evaluate the land visual impact from all the directions, considering that in the north and north-east the effective visibility is obstructed by forest presence.

The Figure 1 and Figure 2 in the **Appendix 2** show the locations of 3 selected viewpoints.

Table 2: Selected Viewpoints

Viewpoint ID	Viewpoint location	Elevation (m)	Distance to nearest turbine (km)	Viewer type	Direction from viewpoint
VP1	Mesteru	134	1.30	Residents of Mesteru	West
VP2	Luminita	185	0.95	Residents of Luminita	South-West
VP3	National road DN 701	285	1.75	Road users	East

3.4.3 Viewpoint Analysis

The assessment from the viewpoints was assisted by the elaboration of photomontages of the project development of 3 selected viewpoints. It must be appreciated that photomontages, by their nature, give a restricted and artificial view and the real effect can only be seen by experiencing the view in person. The illustrations do not therefore provide an exact replication of future views, but the turbines are shown to scale to give an idea of the size of the structures and their effect on the view.

In addition the visibility assessment can be also affected by the light and weather conditions.

The existing views and photomontages for VP1, VP2 and VP3 are shown respectively in Figures 3, 4, and 5 in the **Appendix 2**.

The analysis from each selected viewpoint is referred in the following table.

Table 3: Viewpoint Analysis	
VP1 (*Figure 3 in Appendix 2*)	**Existing View** The existing view in the Figure 3 illustrates the view from Mesteru village towards the application site. The view is characterized by landscape strongly sloping towards the viewpoint, comprising a mixture of grassland and agricultural (cultivated and no-cultivated) lands. A handful of isolated dwellings/ farm buildings and minor roads/tracks are seen in the background. The existing turbines of ENEL are not visible.
	Predicted View The predicted view illustrated in the Figure 3 and shows 20 of the proposed turbines would be visible with hubs on the skyline and upper blades above. The most of turbines of the proposed wind farms would, if constructed, be situated very close to the viewpoint and would become prominent features in the landscape. In the context of existing/consented and proposed wind farms, the wind farm would represent a significant magnitude of cumulative change. No cumulative impact are expected because the existing turbines of ENEL are not visible.
VP2 (*Figure 4 in Appendix 2*)	**Existing View** The existing view is from the county road DJ411 (222B) in the Luminita village. The landscape is characterized by low sloping towards the viewpoint, comprising grazing areas at the foreground whilst at the background there are the residential houses of the villages characterized by kitchen gardens and shelter area for domestic animals. 3 of existing turbines of ENEL can be seen at the right of the Photo, beyond the houses.
	Predicted View Photomontage in Figure 2 illustrates the predicted view and indicates that up to 11 turbines (hubs and rotors) would be visible on the skyline of this view, whilst 2 turbines would are partially visible. The scheme of the proposed turbines appears overlapping on the existing turbines of ENEL, introducing larger structures than currently exist.
VP3 (*Figure 5 in Appendix 2*)	**Existing View** This viewpoint is situated east of the proposed wind farm along the national road DN701 (22A). The existing view, illustrated in the Figure 5, is large scale and expansive. The elevated position of this viewpoint provides open views across the landscape adjacent, which comprises predominantly of grassland and agricultural areas (cultivated and not-cultivated) in the foreground and background. In the mid-ground at the left of the Photo, there is the village of Topolog. The landform gently falls towards the south (at left of the Photo). The existing turbines of ENEL can be visible, although not clearly, on the distant horizon at the left of the Photo.
	Predicted View The photomontage in the Figure 5 illustrated that 14 turbines would be visible (hubs and rotors) on the skyline of this viewpoint. However, the visibility of the wind farm can be full only for road users moving from north to south and not vice versa. Furthermore, field verification indicated that these views along the road would be intermittent due to intervening landforms and undulation in the road and roadside vegetation. The proposed turbines would be clearly seen separate and distinct from ENEL wind farm due to the scale of the turbines and the arrangement of its array in comparison to ENEL, as well as the greater closeness of the proposed wind farm to the viewpoint.

3.4.4 Visual impact assessment

The introduction of new structures and activity around the site will have impacts upon the quality of views experienced by people living, working or visiting the surrounding area. The Topolog-Luminita Mesteru wind farm will be seen from fixed locations and as people move through the area on roads, paths and agricultural farmlands.

The visual impact assessment on the selected viewpoints was based on the assessment methodology of the significance of landscape visual impacts as specified in **Table 1** and was conducted through a combination of the viewpoint sensitivity and the magnitude of change in view for each selected viewpoint.

In detail, the viewpoint sensitivity was defined on basis of the viewpoint characteristics (**Table 2**), the field reconnaissance and the analysis of the existing view reported in the **Table 3**. While the magnitude of change in view caused by the project development was establishing on basis of the analysis of the predicted view reported in the **Table 3**.

In the **Table 4** the significance of visual impacts is reported as assessed through the criteria and target indicated in **Table 1**.

Table 4: Significance of Visual Impacts from selected viewpoints

Viewpoint ID	Viewpoint sensitivity)	Magnitude of change in view caused by proposed development	Significance of impacts
VP1	Medium	Large	Moderate to major
VP2	Medium	Small	Minor
VP3	Low	Small	Not Significant

The significance of impacts is assessed to range from *not significant* at VP3 to *moderate to major* at VP1.

Viewpoint photomontages show that the project would be visible from a number of viewpoints, however the open character of the proposed wind farm and their general uniformity of colour and design enable the developments to relate well to the receiving open and expansive landscape character of the site. Therefore the introduction of wind turbines and ancillary infrastructure will not adversely impact upon the local landscape character beyond the local context.

These impacts will be largely limited in time to the period of operation of the wind farm, currently scheduled to be 20 years, and will be reversed by decommissioning and removal of the turbines and other connecting structures after this period.

3.4.5 Cumulative impact assessment

The existing wind farm of ENEL represents a detracting element which reduces already the landscape quality.

As illustrated in the Figures 3, 4 and 5, the cumulative impacts assessed for the existing ENEL wind farm in addition to the proposed wind farm, notwithstanding deepening from the view, are very limited (as at VP2 and VP3) or absent (as at VP1).

3.4.6 Mitigation measures

In order to minimize impacts arising as a result of the project in terms of landscape character and visual amenity the following mitigation are recommended:

- the avoidance of felling and/or severance of existing shelterbelts;
- the selection of a turbine colour which would typically be a semi matt pale grey which would have the least visual impact on the landscape when seen against the sky for the most part. The matt colour should be non-reflective, which will also help reduce potential impact during sunny conditions. It is noted that these recommendations could be opposing with the mitigation included in the EIAs report about the use of contrasting color at least on the 20% of the rotors to limit the risk collision for birds. In addition, turbine towers will be fitted with a red flashing light with large time intervals between two consecutive ignitions (red flashing lights are as dim as possible to limit visual intrusion with respect to the white constant lights): this is likely to make them more visible at night and at fog presence (during both day and night) and therefore is less likely to be flown into by birds and bats (see mitigation measures in section 4.3)..

The mitigation measures are captured in the ESAP.

4 Appropriate assessment

As already indicated in the Chapter 2 and shown in the **Figure 1**, according the final layout respectively 10 turbines (LU03 - LU011 and ME08) are located within the SCI Podişul Nord Dobrogean and one of them (ME08) within the SPA Padurea Babadag (i.e. the turbine ME08 is located both in the SCI and in the SPA, since part of the Padurea Babadag SPA is also designated as a SCI). Therefore, on the basis of MO 19/2010 (*Approving the Methodology on the Appropriate Assessment of plans and projects with potential effects on natural protected areas of Community interest (Natura 2000 sites)"*), in 2010 an Appropriate Assessment Study was submitted to EPA (to date, there are not yet specific Authorities/Organizations for the management of these Natura 2000 sites) to evaluate potential impacts on nearby two Natura 2000 sites (11 turbines were located within Natura 2000 sites at the time of the Appropriate Assessment Study submission – recently one turbine (T01) was abandoned due to recent optimizations of the project).

A review of the existing Appropriate Assessment of 2010 against the EU Habitats and Wild Birds Directives requirements showed that the data of the ecological baseline and the impacts evaluation on birds and bats were not quite compliant with the EU requirements, requiring therefore additional analyses. In detail:

- notwithstanding the availability of a massive amount of data on the ecological baseline, gathered in 6 years of monitoring activities, some data on the presence of birds and bats in the Project area showed a need for supplementary analysis in line with EU Habitats and Wild Birds Directives. An additional birds and bats monitoring activities were carried out in the spring period (March-June 2013), based on a revised methodology and in accordance with international standards and best practices. In **Appendix 3** a detailed Report, prepared by AS Orimex, containing the results of these new monitoring activities is reported.
- the impacts evaluation on birds was mostly qualitative rather than quantitative and not properly based on the existing baseline (not properly consistent, as indicate in the above point) and species observed during monitoring activities. Furthermore, the impacts evaluation on bats was missing since no species were detected during the whole monitoring period (2006-2012). Therefore, in August 2013 the Sponsor (Land Power) commissioned to AS Orimex an Additional Study, which is reported in **Appendix 4**. Finally, the Additional Study re-presented the ecological baseline and re-assessed the impacts on birds and bats with a different methodology, providing a more detailed and quantitative evaluation in accordance with the Habitats Directive (EU Directive 92/43/EE) and Wild Birds Directive (EU Directive 2009/147/CE), including EU Guidance on *Assessment of plans and projects significantly affecting Natura 2000 sites Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC* (November 2001).

This section of the Supplementary Information Report presents the summary of the results of the Additional documentation prepared by AS ORIMEX with respect to two points above referred.

4.1 Ecological baseline on birds and bats

4.1.1 Birds

The ecological baseline for birds described in the Additional Study is based on:

- bibliographic information that allowed the selection of target species (species of concern potentially present in the site); and
- monitoring data, in detail:
    - the monitoring data for Spring 2013 (March – June) , elaborated in accordance to international standard;
    - the monitoring data for January 2012 – February 2013, re-elaborated in accordance to international standards;
    - the monitoring data for 2006-2011 presented by means of summary tables and aggregated data.

The Additional Assessment has divided the bird species (either directly observed during monitoring, or potentially present according to the existing bibliographic area) into three categories: target species potentially affected, target species not affected, secondary species (including both affected and not affected).

As target bird species (or species of concern) have been considered, since the beginning of monitoring of biodiversity in the studied area, those species protected at international, European and national level, which are susceptible to be subject to the impact of wind farms. Therefore, the target species were selected by taking into account: the standard form of the of SPA Babadag Forest (ROSPA 0091 Babadag Forest), the species of national interest that require strict protection, and migratory species that may cross or reach the area of the wind farm, following the Pontic migration route (Via Pontica flyroute).

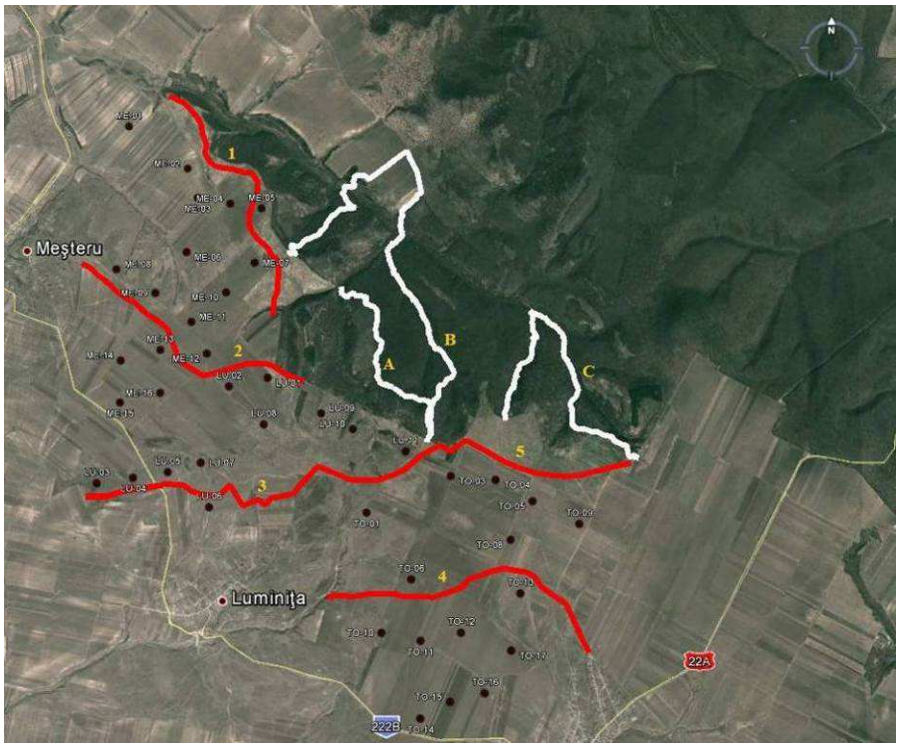
Furthermore, the selection of the target species was carried out also in accordance to the Scottish Natural Heritage Guidance (*Survey Methods For Use In Assessing The Impacts Of Onshore Windfarms On Bird Communities* November 2005 -revised December 2010; hereafter referred as SNHG), specifying the conservation status and the estimated populations. Both resident and migrant species are considered. Proper distinction between resident, breeding, wintering and migrating species is reported.

4.1.1.1. Monitoring methods

Monitoring surveys were conducted through observations along transects and from vantage points.

In spring 2013 monitoring activities, 2 transects were added within the wind farm area (with respects to previous monitoring campaigns); in total 5 transects were investigated. Moreover, 3 further transects (identified as A,B,C) were analyzed in April, extending the survey area to the Babadag Forest (for about 2 km inside), in order to detect potential nests or birds of prey.

Figure 10: Transects crossed within March and June 2013



In line with the recommendations of the Scottish Natural Heritage Guidance (SNHG, December 2010) on the extension of the survey area (Paragraph 6.5.1 of the SNHG, taking into consideration species potentially present in the territory), the full set of transects for the Spring 2013 campaign included: agricultural/grazing areas, ecotonal areas between the forest and the agricultural/grazing areas and portions of the woodland itself.

Three vantage points were utilized in 2013 for the detection of birds in flight.

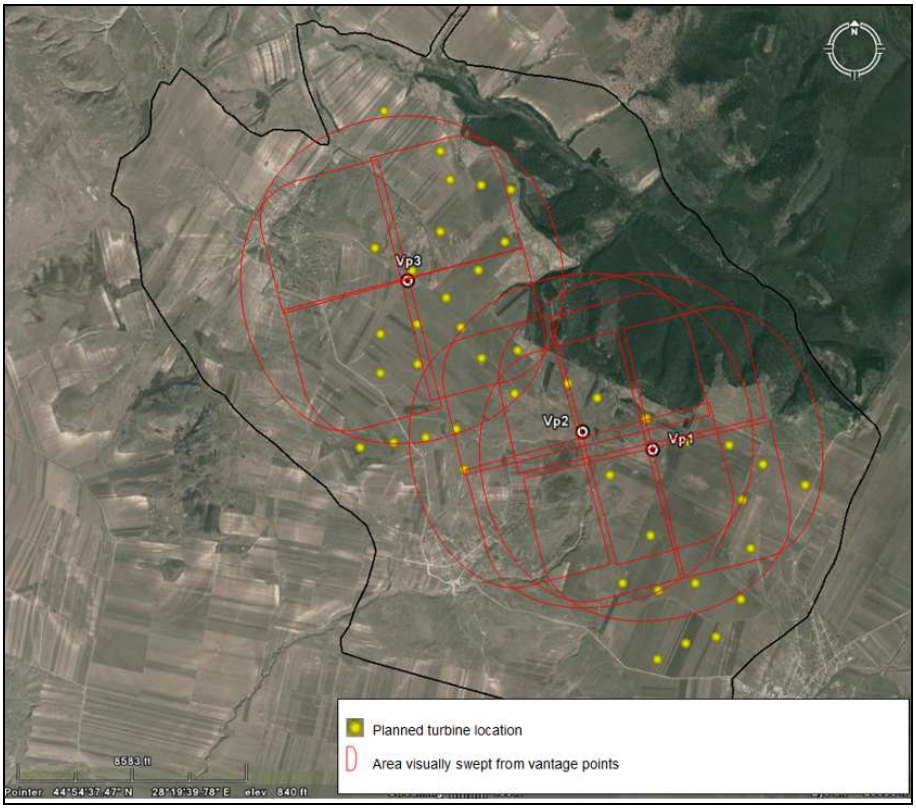
Figure 11: Vantage points

Vantage Points coordinates in WGS 84 system		
Observations points	**Latitude**	**Longitude**
Vantage Point 1	44 54.294	28 21.322
Vantage Point 2	44 54.400	28 20.727
Vantage Point 3	44 55.302	28 19.238

As reported in the Additional Study, the three Vantage Points (**Figure 11**) cover about 98% of the entire surface of to the project area, including also some areas outside it. Although, the locations of three turbines belonging to the Topolog cluster (TO-14, TO-15, TO-16) are virtually outside of the area visible from the nearest Vantage Point (VP1), the area where these three turbines will be located was kept under observation with the help of a spotting scope. Indeed, it was possible to carry out ornithological observations regarding the activity of birds, including (thanks to the altitude at which the VP is located) for the areas from the periphery of Topolog locality.

Furthermore, the three selected VPs indeed cover the critical areas, i.e.: 1. ecotonal area between the agricultural/grazing ecosystems and the woodland and 2. points at higher altitude. The not covered area is topographically depressed, with rather extensive agricultural activities (in some way more intensive than in other zone) and therefore less critic.

Figure 12: Total area visually swept from the three Vantage Points (*source: figure 29 of the Additional Study*)



The time in the field in 2012-2013 for each transect and for each VP at each monitoring day was planned and spent in line with the specifications of the Paragraph 6.5.3. of the SNHG (taking into consideration the species potentially present in the site), as showed in the Tables 18 of the Additional Study.

The names and professional profiles of observers are available for the 2013 campaign and indicated in the Additional Study.

4.1.1.2. Monitoring Report

Regarding results of the monitoring campaigns:

- statistics for 2012-2013 campaigns are analysed within the Additional Study, through numeric evaluations regarding the recorded bird activities and height and direction of flights;
- raw data collected in the period 2006-2011 are reported in aggregated tables in Appendices 7-12 of the Additional Study, in agreement with the “Form 1” and “Form 2” formats required by the SHNG.

The **Table 5** below shows the characteristics of the target birds species considered as potentially affected by the implementation of the wind farm. Data reported in this table (in particular “estimated popolution”) are included in the standard Data Form of Natua 2000 site - SPA Padurea Babadag (approved by the Order of Minister of Environment and Forests no. 2387/2011 for amending Order of Minister of Environment and Sustainable Development No.

1964/2007 on the establishment of the protected area). Data reported in the table are based on literature and some points require a more detailed analysis: however, the table has been utilized as background information. The list of the species actually present within the study area and their phenology, as observed during detailed monitoring activities, are described in the following sections 4.1.1.3 and reported in detail in the Appendices to the Additional Study. Birds of national importance are identified with the SPA qualifying species. Main impacts were evaluated for these species, as summarized in the following section 4.2.1.2.

Table 5: Summary of the characteristics of the "target species considered as potentially affected" by the implementation of the wind farm (*information and data referred in this table are included in the Additional Study*)

Species – Latin name	Species – common English name	SPA qualifying species	Nesting habitat (from scientific literature)	Feeding habitat (from scientific literature)	Estimation of resident, breeding, wintering or passage species population in the studied area	Conservation status	IUCN Red List	Red Book (2005)	Romania (pairs or individuals/ years)*Estimated population	Estimated population in SPA			
										Resident	Breeding	Wintering	Passage
Accipiter brevipes	Levant Sparrowhawk	YES	thin forest	forests, arable land	Species not detected	B	LC	VU	60-100 p (1999-2002)		60-100 p		
Accipiter gentilis	Northern Goshawk	NO	woodland	woodland	resident		LC	-					
Accipiter nisus	Sparrowhawk	NO	areas with anthropogenic habitats and with herbaceous vegetation	areas with anthropogenic habitats and with herbaceous vegetation	passage	B	LC	-	1.200-1.400 p (1998-2002)				2503-3970 i
Anthus campestris	Tawny Pipit	YES	arable land, pastures wetlands stony areas with bushes	arable land, pastures	breeding	B	LC	-	150.000-220.000 p (2000-2002		1600-2000 p		
Aquila heliaca	Imperial Eagle	YES	arable land, pastures	arable land, pastures	passage	B	VU	CR	5-10 p (1990-2002)				2-5 i
Aquila pomarina	Lesser Spotted Eagle	YES	forests interspersed with open areas, near water	pastures, arable land	resident	B	LC	VU	2.500-2.800 p (1996-2002)		15-30 p		4270-8580 i
Asio flammeus	Short-eared Owl	NO	forest and its edges	forest and its edges	breeding		LC	VU					
Burhinus oedicnemus	Stone Curlew	NO	pastures with *Euphorbia*, arable land	pastures, arable land	Species not detected	B	LC	EN	400-800 p (1990-2002)		35-50 p		400-500 i
Buteo buteo	Common	NO	pasune,	pasune,	resident/passag	B	LC	-	28.000-34.000 p				14.675-

Species – Latin name	Species – common English name	SPA qualifying species	Nesting habitat (from scientific literature)	Feeding habitat (from scientific literature)	Estimation of resident, breeding, wintering or passage species population in the studied area	Conservation status	IUCN Red List	Red Book (2005)	Romania (pairs or individuals/ years)*Estimated population	Estimated population in SPA			
										Resident	Breeding	Wintering	Passage
	Buzzard		arable land	arable land	e				(1996-2002)				28.487 i
Buteo lagopus	Rough-legged Buzzard	NO	mountain area	pastures	wintering (rare)		LC	-	500-2000 i (1990-2000)			R	
Buteo rufinus	Long-legged Buzzard	YES	pastures, mountain areas	pastures, wetlands	resident/passage	B	LC	VU	65-110 p (2000-2002)		15-30 p		
Calandrella brachydactyla	Short-toed Lark	YES	pastures, arable land	pastures, arable land	breeding	B	LC	-	10.000-12.000 p (2000-2002)		200-300 p		
Ciconia ciconia	White Stork	YES		wetlands, pastures, arable land	passage	B	LC	VU	4.000-5.000 p (1996-2002)				35.000-122.000 i
Ciconia nigra	Black Stork	NO			Species not detected	B	LC	VU	160-250 p (1996-2002)				1.877-2.123 i
Circaetus gallicus	Short-toed Eagle	YES	forests that alternate with open areas	pastures, arable land	Breeding/passage	B	LC	VU	220-300 p (1995-2002)		20-30 p		
Circus aeruginosus	Marsh Harrier	YES		wetlands, arable land, pastures	resident/passage	B	LC	-	1.700-2.500 p (1998-2002)				1.517-3.970 i
Circus cyaneus	Hen Harrier	YES	forests near to water bodies, wetlands	arable land, pastures, wetlands	wintering/passage	B	LC	-	150-500 i (1990-2000)			20-30 i	110-330 i
Circus macrourus	Pallid Harrier	YES	arable land, pastures	arable land, pastures	passage	B	NT	EN	0-6 p (1990-2002)				70-100 i
Circus pygargus	Montagu's Harrier	YES	wetlands, arable land	pastures, arable land	resident/passage	B	LC	EN	0-12 p (1990-2002)		0-3 p		500-830 i

Species – Latin name	Species – common English name	SPA qualifying species	Nesting habitat (from scientific literature)	Feeding habitat (from scientific literature)	Estimation of resident, breeding, wintering or passage species population in the studied area	Conservation status	IUCN Red List	Red Book (2005)	Romania (pairs or individuals/ years)*Estimated population	Estimated population in SPA			
										Resident	Breeding	Wintering	Passage
Emberiza hortulana	Ortolan Bunting	NO	forest edges, arable land, scrubs	arable land	Species not detected	A	LC	-	125.000-255.000 p (2000-2002)		600-800 p		
Falco tinnunculus	Kestrel	NO	stony places, high sides, nests of crows, inhabited areas	pastures, arable land	breeding		LC	-	10.000 – 14.000 p (1990-2002)				
Falco vespertinus	Red-footed Falcon	YES	arable land, pastures	arable land, pastures	resident/passage	B	NT	VU	1.300-1.600 p (1990-2002)				600-800 i
Haliaeetus albicilla	White-tailed Eagle	YES	meadow forests, wetlands	wetlands	Species not detected	B	LC	CR	28-33 p (1995-2002)		1 p		5-10 i
Hieraaetus pennatus	Booted Eagle	YES	forests, meadow forests with open areas	pastures, arable	breeding/ passage	B	LC	CR	80-120 p (1990-2002)		20-30 p		270-400 i
Melanocorypha calandra	Calandra Lark	NO	pastures, arable land	pastures, arable land	breeding	B	LC	-	85.000-105.000 (2000-2002)		800-1500 p		
Merops apiaster	Bee-eater	NO	waterbanks loess banks	pastures, arable land, NOscrubs	breeding		LC	-	15.000 – 20.000 p (2000-2002)				
Miliaria calandra	Corn-Bunting	NO	pastures, arable	pastures, arable land	breeding		LC	-	940.000 – 1.200.000 p (2000-2002)				
Milvus migrans	Black Kite	YES			Species not detected		LC	-					
Pandion haliaetus	Osprey	NO	wetlands	wetlands	passage		LC	VU					
Pelecanus crispus	Dalmatian Pelican	NO	wetlands	wetlands	Species not detected		VU	CR	20-50 p (1900-2000)				

Species – Latin name	Species – common English name	SPA qualifying species	Nesting habitat (from scientific literature)	Feeding habitat (from scientific literature)	Estimation of resident, breeding, wintering or passage species population in the studied area	Conservation status	IUCN Red List	Red Book (2005)	Romania (pairs or individuals/ years)*Estimated population	Estimated population in SPA			
										Resident	Breeding	Wintering	Passage
Pelecanus onocrotalus	White Pelican	NO	wetlands	wetlands	passage	B	LC	VU	3.500-4.000 p (1990-2002)				2850-3800 i
Pernis apivorus	Honey Buzzard	NO	pastures	pastures	passage	B	LC	VU	2.000-2.600 p (1990-2002)				3190-7050 i
Tadorna ferruginea	Ruddy Shelduck	NO	wetlands	wetland	Species not detected	B	LC	CR	20-25 p (1990-2002)		3-7 p		<243 i
Tyto alba	Barn Owl	NO	inhabited area	arable land, pastures	Species not detected		LC	VU					

Legend

IUCN Red List – Red Book (2005) Vulnerable (**VU**); Near threatened (**NT**); Least concern (**LC**); Critically endangered (**CR**); Endangered (**EN**)

Conservation Status Degree of conservation of the features of the habitat which are important for the species concerned. And possibilities for restoration. **A.** conservation excellent= elements in an excellent condition, independent of the grading of the possibility of restoration; **B**. Good conservation= elements well conserved independent of the possibility of restoration,= elements in average or partially degraded condition and restoration easy; **C**: average or reduced conservation = all other combinations

Estimated population Status:i-individuals; **p**-pairs; **Global:**Global assessment of the value of the site for conservation of the species concerned **P-** present; **RC**- relatively common; **R**- rare; **C**- common

4.1.1.3. Monitoring results

Most important comments about monitoring results are reported in Paragraph 5.1.4 of the Additional Study.

Bird species are the most numerous group of vertebrates present within the studied area. Based on their affinity to certain types of habitat, bird species can be classified along the following ecological categories:

- Species which prefer arboreous vegetation (wooded areas and orchards) as a feeding, sheltering and breeding habitat, such as *Dendrocopus major* and *Dendrocopus medius.*
- Species nesting in forested areas, but reaching agricultural land and pastures in search for food. Characteristic of this group are raptor species, diurnal and nocturnal, as well as many Passeriformes.
- Small insectivorous and granivorous species, having a preference for open fields, dominated by herbaceous vegetation, as feeding and breeding habitats, such as *Oenanthe oenanthe, Anthus campestris, Alauda arvensis, Callandrella brachydactyla, Melanocorypha calandra.*
- Species which prefer shrubbery as shelter and breeding habitat, but open fields for feeding habitat, such as: *Lanius collurio, Lanius minor, Carduelis carduelis, Miliaria calandra, Emberiza citrinella.*
- Usually insectivorous species nesting along loess ravines: *Coracias garrulus, Hirundo rustica and Merops apiaster.*
- Synanthropic species, characteristic of inhabited areas, typically exhibiting high levels of adaptability to the anthropic factor, such that the population size of these species is the largest one within the studied area. Among these, *Corvus frugilegus, Corvus cornix, Corvus monedula, Hirundo rustica, Passer domesticus,Passer montanus, Sturnus vulgaris, Streptopelia decaocto are noteworthy.*

Throughout the monitoring period (January 2012-June 2013), some fluctuations in the population size for the bird species observed in the studied area were witnessed, largely determined by the seasonal climatological variations. As such, during the winter season, the sedentary bird population was supplemented by individuals coming from northern areas, those same individuals taking the same routes back at the onset of spring. For representatives of the Laniidae, Hirundinidae, Motacillidae, Coraciidae, Meropidae, Accipitridae and Falconidae families, the population size begins to decline at the end of the summer season, followed by a natural increase at the beginning of spring.

From the first observations carried out in the area for the purpose of elaborating environmental studies, and up to the present, no major changes in the bird population structure were recorded on site, considering that the area retaining the same environmental conditions, and continuing to be impacted by human factor. Since the arable lands in the area are being maintained through agricultural works specific to the type of culture and its vegetation period, they do not represent optimal nesting habitats, but can offer shelter to juvenile and mature individuals. Thus, juvenile individuals of the *Anthus campestris and Oenanthe oenanthe* species were recorded in arable lands across the area. The plane areas within the pastures do not offer favorable shelter conditions for species nesting at ground level. This aspect is of added importance, since a heavy presence or predator species, such

as *Vulpes vulpes, Mustela eversmanii, Martes foina, Canis aureus and Meles meles, was observed in the area.*

A further well-represented bird family on site is the Alaudidae family, formed of small- or medium-sized songbirds, with uniformly colored feathers, building their nests on the ground; they can be migratory, partially migratory or sedentary species. The crested lark was observed on the side of roads or in the fields, flying in small flocks in wintertime. *Calandrella brachydactyla, Melanocorypha calandra and Alauda arvensis* individuals constantly reach the wind farm site, and were observed to have a preference for open areas, pastures and fields cultivated with grain. A particularity for larks building nests at ground level is the earthy coloring of their plumage, which helps them camouflage and blend in chromatically with the environment, making them difficult to notice. In springtime, larks exhibit nuptial behaviors; on sunny days, they can be heard singing and observed while performing their characteristic flight pattern, namely a slow ascent, followed by soaring and an abrupt descent.

Emberizidae are predominantly granivorous bird species, which have a preference for open areas with small shrubs and agricultural lands. Individuals pertaining to the two species that were identified, *Miliaria calandra* and *Emberiza citronella* were mainly observed in area with herbaceous steppic vegetation and scrubs *(Crataegus monogyna).* In August and September, a period which coincides with that of the maturation of the sunflower head, numerous buntings were identified on cultivated plots of land on the wind farm site.

The Laniidae family is well represented in the area, mainly due to the presence of grasslands with scrub vegetation, which serve as both shelter and feeding habitat. Representatives of this family are species mainly feeding on large insects but also small vertebrates such as lizards, mice, but also birds. Two such species are usually encountered during the vernal and aestival seasons, the *Lanius minor, Lanius collurio*, and accidentally *Lanius excubitor* individuals, which are normally guests during winter. Even if the 2012 season fieldwork records feature numerous sightings of *Lanius excubitor*, their number is certainly smaller, the difference stemming most likely from the similarities between *Lanius minor and Lanius excubitor.*

Diurnal raptors were observed in flying over large areas, particularly soaring in active search for prey, or in passing during the migration period.

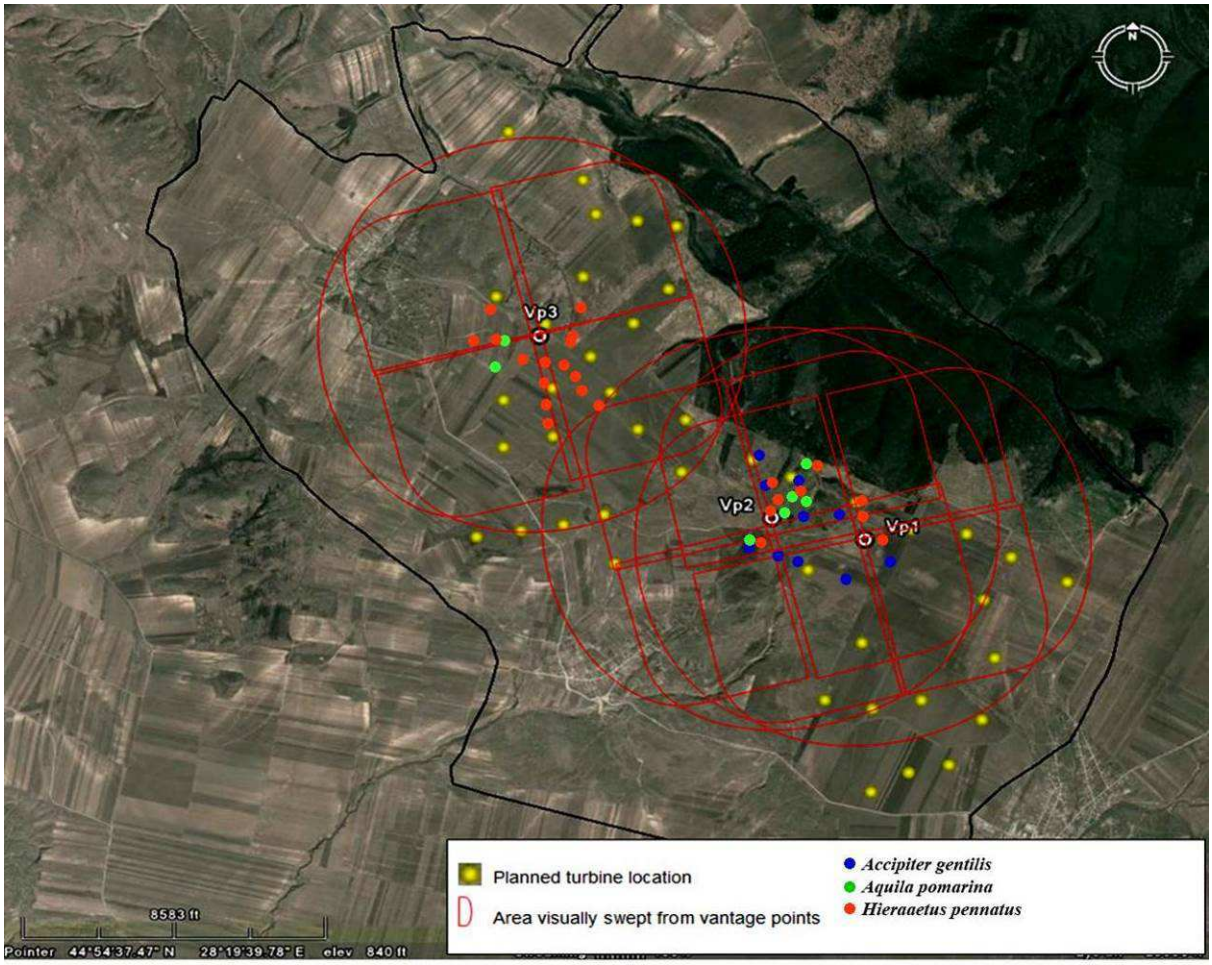
At the same time, the presence of nocturnal raptor species (for example, *Asio flammeus*), was recorded during nighttime monitoring sessions, particularly in the area of the Babadag forest, but also around the forest edges.

Knowing the activity of the raptor species considered to be resident in the studied area (according to the observations from the research from the period 2006 - 2013) was one of the main interests of the team of experts which conducted the inventory and monitoring. This aspect was considered important due to the potential interactions between large raptors permanently present in the area and moving elements of wind turbines.

The data from the centralization of the observations collected mostly in the last year of study (2012 - 2013) has resulted in analyzes which (among others) were the basis for the maps presented next. This form of presentation of the results was considered appropriate, as it can clearly track the position of resident diurnal raptor species sightings, both in relation to the Vantage Points, and especially with the projected locations of the wind turbines.

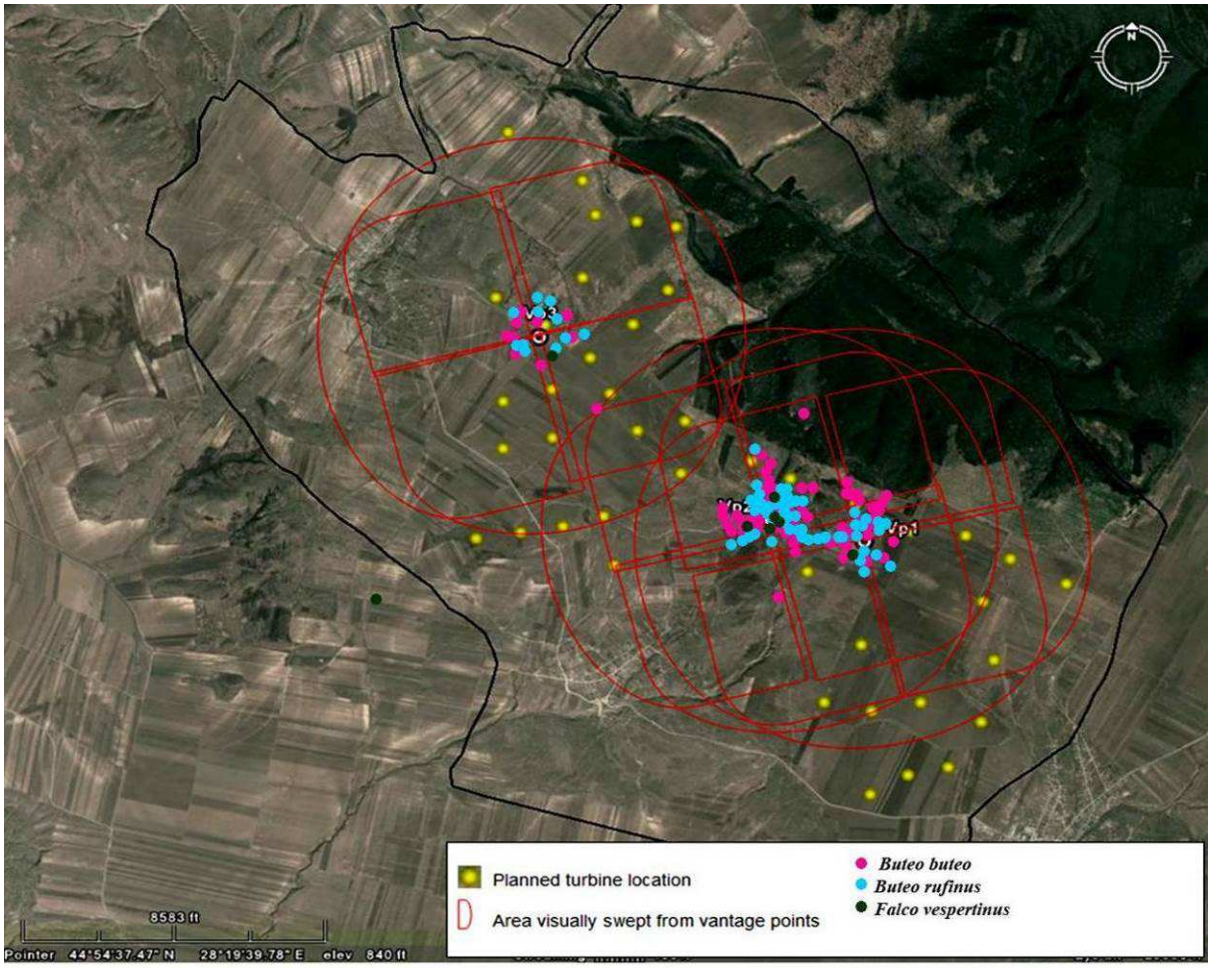
The activity of the species *Accipiter gentilis, Aquila pomarina* and *Hieraaetus pennatus* is presented in figure below. These three species activity was recorded over the entire duration of the observations program, which led to the conclusion that there potentially are nesting specimens area, but there certainly are resident specimens.

Flight activity of Accipiter gentilis (no. of observations = 10), Aquila pomarina (no. of observations = 9) and Hieraaetus pennatus (no. of observations = 39), during the entire observation time



The activity of the *Buteo buteo, Buteo rufinus* and *Falco vespertinus* species is presented in figure below. As in previous cases, these species have recorded activity in the area over the entire duration of the program of observations, which led to the conclusion that there are potentially nesting specimens in the area, but there certainly are resident ones.

Flight activity of Buteo buteo (no. of observations = 85), Buteo rufinus (no. of observations = 84) and Falco vespertinus (no. of observations = 12), during the entire observation time

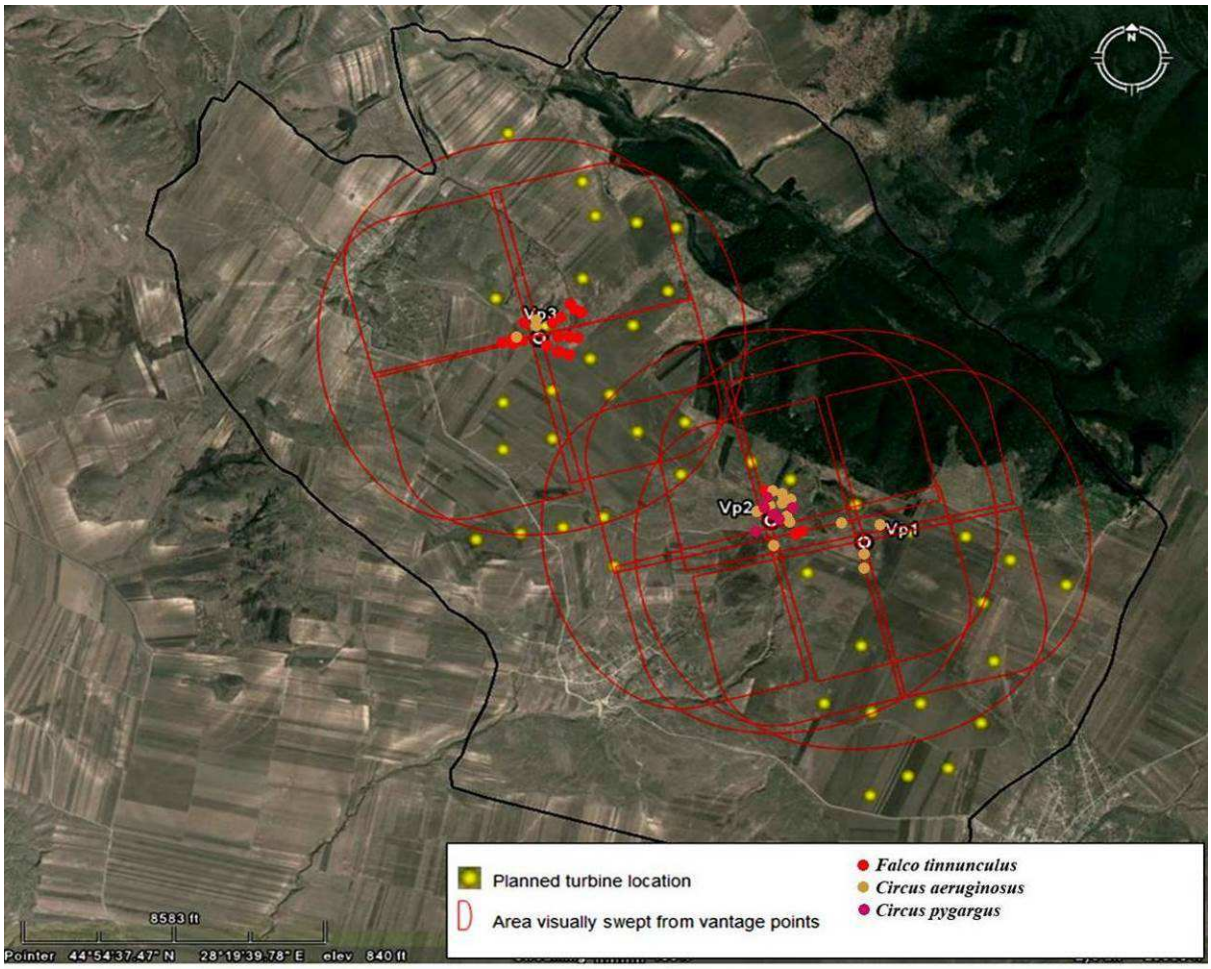


In figure below, the activity of *Falco tinnunculus, Circus aeruginosus and Circus pygargus* species is illustrated. Most of these bird flight recordings were made during 2012 - 2013, with the intensification of the inventory and observation efforts. The conclusions resulted regarding the species mentioned above accredits their presence in this area as resident species. The number of observations and their distribution suggests the presence of the species in the central and Northern part of the wind farm (this was one of the reasons for grouping the observations regarding the species presented, on the same map).

In all cases of the nine species of diurnal raptors considered residents in the area, it is necessary to continue observations for the future periods of the construction of the wind farm, and especially after it comes into operation. Any change in the behaviour of the

species observed should particularly be followed, once all elements of the wind farm begin operation.

Flight activity of Falco tinnunculus (no. of observations = 22), Circus aeruginosus (no. of observations = 17) and Circus pygargus (no. of observations = 6), during the entire observation time



Maps show points (the point where the raptor was flying at the moment of identification) and not the lines of flight of each observed bird. On the other hand, the Additional Study of AS ORIMEX reports also some statistics about flight directions and heights of birds based on the observations from VPs during 2012-2013. In addition, more detailed information are reported in the Appendices to the Additional Study and in the 2013 Monitoring report (**Appendix 3**). The 2013 Monitoring report clearly stated that:

- the species *Accipiter nisus* is considered being migratory in the area, but in number of maximum three exemplars;
- *Accipiter gentilis* is considered as being resident, with a number of 4 exemplars;
- *Aquila pomarina* is present as resident species with a number of four exemplars (most probably two pairs);
- *Ardea cinerea* is migratory with three exemplars transiting the area being only;

- *Buteo buteo* was considered both migratory (45 exemplars) and resident (one pair);
- *Buteo rufinus* was also considered both migratory (41 exemplars) and resident (two pairs);
- *Circus aeruginosus* migrates in number of maximum 16 exemplars, out of which one could be resident in the area (it was observed more times);
- *Circus macrourus* is considered migratory, with two migratory exemplars;
- *Circus cyaneus* showed 9 migratory exemplars;
- *Circus pygargus.* This species has been initially considered in passage only (five exemplars), then resident in the Additional Study after more studies.

The following species were considered being only in passage through monitored area:

- *Circaetus gallicus* (five exemplars);
- *Ciconia ciconia* (102 exemplars seen in 2013);
- *Pernis apivorus* (one exemplar);
- *Pelecanus onocrotalus* (15 exemplars; seen only in 2012 and 2013);
- *Phalacrocorax carbo* (11 exemplars in 2013) [there is an inconsistency about this species, mentioned in the 2013 Monitoring report and in some tables on the Additional Study and not mentioned in others; we assume correct the tables that report the presence of the species];
- *Pandion haliaetus* (four exemplars).

Also, under the same observations, it may be considered that the following species have resident exemplars in the monitored area: *Falco tinnunculus* (eight exemplars)*, Falco vespertinus* (four exemplars) and *Hieraaetus pennatus* (four exemplars).

In case of the species of nocturnal birds, it must be noted the fact that the heard/recorded exemplars have as preferential habitat the forest areas. There were identified based on recordings: one species from Passeriformes order - *Lullula arborea*; and 2 species from Strigiformes order - *Athene noctua* and *Strix aluco*, out of which only *Lullula arborea* is mentioned in ROSPA0091 Babadag Forest. By direct observations, the species *Otus scops* of Strigiformes order was observed.

4.1.2 Bats

In line with the international standards (e.g. *EU Guidance on wind energy development in accordance with the EU nature legislation*, 2011), the baseline for bats population was developed through the following steps:

- identification of 10 bat target species by a literature research of the species in Romania, Europe and internationally, defining in detail ecology and conservation status for each identified species;
- analysis of the results from Spring 2013 monitoring: it is noted that only 8 species of 10 target species were detected.

Indeed, as detailed in the Additional Study, the Spring 2013 surveys were conducted by means of more sophisticated instrument and methods in line with the international

standards, allowing to distinguish different bats species. In addition a field research of places of refuges and inspections for the identification of potential breeding bat colonies were carried out, however two places were detected about 2km and 5 km far the wind farm site.

During bat monitoring between March-June 2013, the number of observations in the area were very low and bat populations were mostly concentrated in ecotonal areas (which are a narrow belt nearest the wooded area), where the micro-climate and habitat conditions were favorable to the bats. Otherwise within the wind farm area, the trophic offer for chiropters was lower, weather conditions were unfavorable and the distance towards day shelters was relatively high.

These results are in line with monitoring data collected from October 2006 to January 2013. In addition, it is noted that number of detected bat species are very low than the estimated populations were in according to the Red Book of Vertebrates from Romania (2005).

4.2 Impacts evaluation

4.2.1 Birds

4.2.1.1. Impact assessment methods

For impacts evaluation, given risks potentially due by the wind farm development, birds species present in the area – either directly observed during monitoring, or potentially present according to the existing bibliographic data – were divided into three categories: target species potentially affected, target species not affected and secondary species not affected.

The Additional Assessment carried out the impacts evaluation for all three categories of bird species defined on basis of the risks that could be posed by the presence of wind farm, i.e. target species potentially affected, target species not affected, secondary species (including both affected and not affected). See the section 4.1.1 for the definition of target species. In detail, impacts are assessed separately considered for each species and taking into consideration potential effects in terms of:

- General aspects;
- Displacement and barrier effect;
- Collision risk;
- Habitat loss.

Numeric assessment of the collision risk is provided for target species, on the basis of data collected in 2012 and 2013 and the method suggested by the Scottish Natural Heritage Guidelines (SNHG).

Cumulated impacts are evaluated in the Additional Study taking into consideration the nearby wind farm, already in operation, owned by TOTAL ELECTRIC (ENEL). The wind farm with a total capacity of 27 MW consists of 11 turbines:

- 6 Vestas V80 2MW turbines;

- 5 Vestas V90 3MW turbines.

The turbines are located outside Topolog Village, Tulcea District (T43, P A276, T62, P391, T 63, P 394, T81, P479, T67, P 431), in an area consisting of arable land and pastures.

The wind farm ensemble (Land Power + TOTAL ELECTRIC) thus consists of 53 wind turbines, erected on predominantly agricultural land. Of the 53 wind turbines which make up the wind power ensemble, 34 (64.2%) fall outside all protected areas, including Natura 2000 sites, and the rest of 19 (35.8%) turbines are located on Natura 2000 sites.

4.2.1.2. Impact assessment results

According to the Additional Study of the 74 species considered to be target species, the individuals of 34 species can be considered potentially affected by the implementation of the wind farm, in one way or another. In the following only the impacts assessment results for the target species potentially affected by the wind farm development (as listed in the **Table 5**) are summarized. The comprehensive impacts evaluation is referred in the Additional Assessment (**Appendix 4**).

The list of target species potentially affected includes 21 species of diurnal and nocturnal raptors, 7 species characteristic to habitats of steppes, forest-steppes, areas with rocks or agricultural crops, and 6 migratory species. However, of these species, 9 - *Accipiter brevipes, Burhinus oedicnemus, Pelecanus crispus, Tyto alba, Haliaeetus albicilla, Milvus migrans, Ciconia nigra, Emberiza hortulana, Tadorna ferruginea* - were not identified during monitoring activities and their presence/migration in the wind farm area is only potential (referred in previous studies or in literature).

According to the Table 41 of the Additional Study, the individuals of 12 target species are at high risk (all other species are less affected), 10 of which has high risk for habitat displacement and the remaining 2 for collision. Among these species:

- *Falco vespertinus* is classified NT (IUCN Red List) and VU (2005 Red Book – Romania 2005); and
- *Hieraaetus pennatus* is classified LC (IUCN Red List) and CR (2005 Red Book – Romania 2005);
- All other species potentially affected are classified less endangered than the above ones.

Collision risk

According to the Table 41 of the Additional Study, 2 target species (*Ciconia ciconia* and *Ciconia nigra*) are at high risk of collision, 23 at moderate risk and 9 at insignificant risk.

Collision risk is potentially high for *Ciconia ciconia* and *Ciconia nigra*. However, based on the observation of *Ciconia ciconia* species (as many as 40 individuals could be recorded in April 2013) the risk of collision with the turbines at the Dorobantu-Topolog wind farm is insignificant due to the fact that the flocks pass at heights greater than 400m, and no solitary individuals or groups were observed on the ground at the wind farm site. Furthermore, major details on the collision risk estimation are provided in the section 4.2.1.3. Regarding *Ciconia nigra*, this species was never seen in the region during monitoring and therefore the actual probability of a collision is very low (non-calculable), therefore the overall impact on the population of *Ciconia nigra* is therefore null or negligible.

Regarding the collision risk for raptor, e.g. for *Falco vespertinus* and *Hieraaetus pennatus*, the estimated showed very limited impacts for both species: the collision risk is 0.0351 event/year (<0.00042 events/MW/year considering 82 MW for a total of 41 turbines) for

Falco vespertinus and for *Hieraaetus pennatus* 0.0306 event/year (<0.00037 events/MW/year considering 82 MW for a total of 41 turbines).

Barrier effect

According to the Table 41 of the Additional Study, the barrier effect is very limited for target species potentially affected, because no large numbered flocks were recorded. The only flocks observed were poorly represented in terms of numbers of specimens, crossing the area studied during the migration period, at great heights.

Similar considerations applies when the wind farm ensemble (Land Power + TOTAL ELECTRIC) are considered. Vantage Points observations over the studied area carried out in spring 2013 included the site of the Total Electric wind farm as well, therefore, the data collected and annexed to the Monitoring Report obtained for the spring season, which coincides with the period of operation of the wind farm, reveals the fact that it did not serve as a barrier for migrating birds. Specifically, large aquatic species, in small numbers, crossed over the wind farm at high altitudes, much above the turbines, whereas migrating raptor species crossed the wind farm both above and through the turbines.

Part of the raptor birds identified to be nesting and/or residing in the targeted area used the Total Electric wind farm area as a feeding area, during the spring 2013 observations period. Representatives of the *Buteo buteo, Buteo rufinus, Falco tinnunculus, Falco vespertinus* and *Circus aeruginosus* were recorded hovering or actively flying over the arable lands and pastures in the immediate vicinity of Total Electric turbines using these nearby areas as a feeding areas. In some cases (*Falco tinnunculus* and *Falco vespertinus*), individuals were recorded in passing between the blades of working wind turbines. In further stages of avifauna monitoring (fall 2013), observations on area usage within the Total Electric wind farm will continue.

Habitat loss

The habitat used for each of target species potentially affected by the wind farm development is reported in **Table 5**.

Regarding the target affected species individuated in Table 41 of the Additional Study, the most important risk factor is the permanent or temporary loss of habitat during construction works (installation of wind turbines and construction of the access roads network). While, during the operation of the wind farm there shall be no impact over the habitats, there being no polluting emissions due to the technology employed.

In detail, according to the evaluation of the habitat displacement (direct and indirect) reported in the Table 41 of the Additional Study, 10 of the target species are at high risk, 7 at moderate risk, 1 at small risk and all other species are not impacted (all other species have null impact).

For target species at high risk during construction the Additional Study indicates that mitigation/compensation measures are necessary to reduce loss habitat mitigation/compensation. In particular, identified measures are: recovering of the areas with fertile soil surfaces immediately after the construction works and conversion into grazing lands the agricultural areas within SCI/SPA purchased by Land Power and not used for the turbines installations. Major details on these measures are reported in paragraph 4.3.

In addition, the wind farm development could be brings the following benefits for biodiversity in the area:

- eliminating fire hazard (via the practice of setting fire to stubble) on the wind farm surface, offers additional protection for species in the terrestrial avifauna and fauna which utilize the area for feeding;
- forbidding hunting within the wind farm perimeter and in the studied area, which currently is part of a hunting area;
- forbidding aerial pesticide treatments in the wind farm area will significantly reduce the possibility that chemicals reach additional land surfaces and affect local flora and fauna outside the agricultural cultures (e.g. Steppe areas and forested areas).

In conclusion, taking into account the proposed mitigation/compensation measures as descripted in detail in the paragraph 4.3 and given the wind farm layout and the location of the wind farm in a peripheral area of migration flyroute, the farm it is not expected to contribute towards a significant residual effect upon birds and the integrity of two Natura 2000 sites.

With reference to potential cumulated impacts, the built surface of the wind power ensemble constitute approximately 0,00006% of SPA Babadag Forest, and respectively approximately 0,003% of SCI North Dobrogea Plateau, which represent extremely small areas compared to the areas of the protected territories. In addition, uncultivated land within the studied area are visibly affected by overgrazing, with effects on both local flora and fauna, and upon the construction of the wind power ensemble and consequent reduction in grazing, it is even expected that the state of the local ecosystems improves.

4.2.1.3. Detailed analysis for migratory birds

The impact on *Ciconia ciconia* is quantifiable in a potential loss of one individual in ca. 6 years (collision risk: 0.166 event/year; <0.0 events/MW/year) and it is considered very limited (not relevant for the local or global population). Similar consideration apply to *Pelecanus onocrotalus* (collision risk: 0.183 event/year; < 0.0022 events/MW/year considering 82 MW for a total of 41 turbines). The collision risk for raptors (sum of all species, resident and migrant) is very low and limited. Collision risk for other important species migrating on the Via Pontica flyroute is negligible and not numerically calculable.

Circus cyaneous and Cyrcus pygargus are migratory species (C*. pygargus* might be resident also) only recently recorded (in 2012 or 2013). As shown in the **Table 5**, these species present a good conservation status as defined of the SPA data sheet and EU Wild Birds Directive. The absence of these species in the logs of past years may be due to natural fluctuations or limited monitoring effort in the past; any case, data of the whole period are consistent with the conclusion that the presence of the species in the wind farm area is in any case limited (significant population of these raptors in the past, if present, would likely have been detected). Collected data are considered sufficient for a reliable assessment of the impacts on the species, which is very limited.

4.2.1.4. Breeding passeriformes

Some small species (most of them passeriformes) breed in the wind farm area, especially in the grazing zones, and potential impacts (in terms of habitat loss, without proper compensations) are possible. However, potentially impacted species are not classified as

threatened (according to IUCN classification) and specific mitigation/compensation measures are properly identified.

As described in the Additional Study and summarized in paragraph 4.3, mitigation/compensation measures for reducing the habitat losses of these species consist mainly in the conversion into grazing areas the agricultural areas within SCI/SPA purchased by Land Power and not used for the turbines installations.

In conclusion, residual impacts (after the implementation of envisaged mitigation/compensations) on actually or potentially breeding species in the wind farm nearby are considered not significant.

4.2.1.5. Breeding raptors

Some raptor species also breed in the wind farm area or in the nearby woodland and some additional considerations are necessary for some species.

An interesting aspect revealed through Vantage Points observations is that all diurnal raptor species continued to use the Total Electric wind farm site as a feeding area, and no collisions with functioning turbines were observed. However, as already described in the paragraph 4.1.1.3, the Additional Study recommends that in all cases of the nine species of diurnal raptors considered residents in the area, the already planned periodic monitoring during the wind farm construction and especially the operation, will allow to: (1) follow any change in the behavior of the species observed, (2) to better understand the trends of these species and (3) allow addition of new mitigation/compensation measures in case new data suggest more significant impacts than reported here.

Other than the current observation based on the existing turbines of the Total Electric wind farm, the Additional Study shows that the calculated collision risk (probability of individual a fatality) is limited. The wind farm will have only minor effects on the life expectancy of each individual and therefore negligible effects on the whole population of the species potentially affected by the collision risk (see the Table 41 of the Additional Assessment). E.g., the collision risk for *Hieraaetus pennatus* is only 0.00482 events/year (in other words: one fatality is expected every 207 years for each individual).

In the Additional Study a detailed analysis is reported for the species for which the impact assessment is more complex, i.e. *Hieraaetus pennatus* and *Haliaeetus albicilla.* In detail:

- *Hieraaetus pennatus:* potential high risk of the feeding habitat loss is particularly present during the wind farm construction when human presence at the site along with noise caused by heavy equipment can constitute a factor of disturbance for the feeding habitat. As indicated in **Table 5**, this species has a good conservation status as defined of the SPA data sheet and EU Wild Birds Directive. In conclusion, given that the site is not a preferred feeding area as resulting from observations carried out before the onset of the construction works and considering that mitigation/compensation measures are planned for reducing human impact in the post-construction stage, the Additional Study evaluates that the local population is not likely to undergo a change in numbers;
- *Haliaeetus albicilla:* species is not identified, it has a good conservation status (see **Table 5** and the impact risk is considered negligible, given the results from field observations and the large distance between the wind farm and the potential nesting

areas (given that solely two nesting individuals are included in the Standard Data Form of ROSPA Babadag Forest, and potential nesting areas are located approximately 20 km to the East of the analyzed wind farm). This conclusion is also based on bibliographical information, such as the RSPB Research Report No 20, J. A. Bright et all, 2006 - as part of a programme of work jointly funded by the RSPB and Scottish Natural Heritage, which notes that White-tailed Eagle home ranges (1km squares) and nest locations were buffered by a radius of 5km, and this area classified as 'high sensitivity'. This precautionary distance is considered reasonable based on the extremely small and localized nature of the population.

More significant effects on bird of prey may be caused by the habitat loss for passeriformes and small mammals and reduced density of prey. As mentioned, specific mitigation/compensation measures have been identified. The measure may be very effective and the new grazing areas may become very attractive for small species; the density of potential prays for raptors may increase and the site may become a nesting area for *Hieraaetus pennatus*. However, the increased activity of raptors in the area, that may be negatively affected by the presence of the wind farm. In other words, the new grazing areas intended mainly for the conservation of Passeriformes (and *Hieraaetus pennatus)*, may become trap areas for raptors. Therefore, during at least the first three years of operation the effectiveness of the mitigation measures shall be verified through the monitoring activities and if necessary this mitigation should be revised and refined (e.g. compensation could be activated on lands more distant from turbines), or shutdown protocols could be developed.

In conclusion, residual impacts (after the implementation of envisaged mitigation/compensations) on raptors actually or potentially breeding in the wind farm nearby are considered not significant.

4.2.2 Bats

As indicated in the paragraph 4.1.2, only 8 bat species were detected during the March-June 2013 monitoring campaign however impacts evaluation were carried out for all 10 target species potentially affected (2 additional species are *Myotis myotis* and *Pipistrellus nathusii*, that are species potentially present in Babadag Forest and mentioned in bibliographic sources). It is noted that impacts on target species not detected during surveys are potential, and the assessment is based on literature information (characteristics of the species, conservation status, etc.).

The impacts assessment was carried out according to international standards (e.g. *EU Guidance on wind energy development in accordance with the EU nature legislation*, 2011) for each bat target species (one by one), evaluating the following potential impact:

- loss of hunting habitats;
- loss of roost sites;
- collision risk.

According to the Table 45 of the Additional Assessment, the overall impacts are considered moderate. In detail only one species - *Nyctalus noctula* - is characterized by a high collision risk, 5 register a potential moderate collision risk and 4 an insignificant risk. Regarding the hunting habitats, 3 species recorded an insignificant risk of loss of habitat, for 6 species the predicted impact is moderate, and for the species *Barbastella barbastellus*, given the

ecological characteristics, the potential impact is absent. Finally, no impacts are evaluated for the loss of roost sites, since the built surfaces do not target karst areas, forested or residential areas.

In conclusion, residual impacts (after the implementation of envisaged mitigation/compensations) on bats actually or potentially present in the wind farm area are considered not significant.

4.3 Mitigation/compensation measures

The existing Appropriate Assessment of 2010 indicated the following main mitigation actions to be implemented during the construction works to reduce impacts on fauna and avifauna:

- reduction of the areas affected by the construction of the ME8-ME9-ME6 turbines (these areas are potentially humid and are a refuge for bird species. The following species were observed in these zones: *Hirundo rustica*, *Lanius minor*, *Lanius collurio*, *Merops apiaster*, *Upupa epops*, *Falco tinnunculus*, *Oenanthe oenanthe.* It is noted that these species are not included in the list of the Padurea Babadag SPA) and limitations of acoustic emissions between March and August, which is the reproductive period for a certain number of fauna species;
- ban of involving the area of LU4 turbine in the construction works and limitation of traffic from June to September. Indeed, the nearby area to LU4 turbine (located into the Podişul Nord Dobrogean SCI) is a humid zone with the presence of amphibians (such as *Bufo viridis* is a protected amphibian by the GEO n. 57/2007 but is not included in the list of the Podişul Nord Dobrogean SCI) with the breeding period in March-June and the period of the release of the young in June-September;
- conducting the excavations in the area of the LU9-LU10-LU11 turbines (excavation for turbine erection and electric buried cables) outside the period March-August, which is the reproductive period for the terrestrial fauna and avifauna species.

In addition to these above actions, as resulting by the Additional Study, supplementary mitigation/compensation measures were indicated in the Chapter 7 of the Additional Study in order to minimize the potential impacts on birds and bats. In detail, as indicated in the Table 41 and the Table 45 respectively for birds and bats, the need of the mitigation measures is identified for each targeted species potentially affected with a potential risk of impact from moderate to high.

In the following, main mitigation measures indicated in the Additional Study are summarized for birds and bats protected species, distinguishing between construction and operation period.

<u>Birds - wind farm construction:</u>

- install the temporary storage of the turbine components and construction materials on arable lands within the wind farm, and at a distance as large as possible from in the forest limit (near DJ222B), in order to avoid the disturbance of avifauna and fauna species from Babadag Forest;
- after the construction works, the recovering of the areas with fertile soil surfaces will be immediately carried out, making the recovery period of these areas minimum, in

order to avoid the habitat fragmentation and prevent the development of invasive species. It will need to savage and store topsoil for later rehabilitation. In detail, all pasture and non-agricultural ground disturbed by construction works will be restored with topsoil, regarded all arable lands, and re-vegetated with native species, preferable before winter period. As possible, restoration will be carried out when all construction are completed. Vegetation soil will be stored separately for future landscaping purposes and stored near the switchyard area. All the soil stockpiles at the site will be controlled in terms of slope stabilization and runoff in order not to adversely impact the surrounding lands (i.e. agricultural areas);

- following the completion of the construction works and after the areas temporarily covered with excavated rock, fertile soil and construction materials deposits are cleared, grazing will be limited in the turbine areas within the SCI North Dobrogea Plateau until vegetation is self-sustaining, at least 1 year (one vegetation season). This measure is taken in order to allow the return of vegetation on the surfaces initially affected by construction works, being at the same time beneficial for the local fauna.

<u>Birds - wind farm operation:</u>

- convert into grazing areas the agricultural areas within SCI/SPA purchased by Land Power and not used for the turbines installations, in order to restore the habitat losses. In detail, the pasture surface permanently affected by the wind farm elements is of about 3Ha. To compensate for the loss of the pasture habitat, arable land plots (Nc295, Nc345, Nc1196, Nc1275) are chosen, in the area of turbines ME-06, Me-10, ME-07 and Lu-01, with a total area of 7.5 Ha are identified in the vicinity of existing pasture areas. These plots are chosen with the purpose of creating continuity for the habitat presently used by local species, in particular as feeding habitats;
- increase the nocturnal visibility of the turbines through the equipment of flashing light, with large time intervals between two consecutive ignitions. These turbines are more easily recognized by migratory birds, when using alternative lighting, in detriment of using continuous light;
- apply the turbine shutdowns during foggy days, either daytime and nighttime, when the visibility is lee than certain minimum distance. Fog causes migrating raptors to fly lower in daytime, which increases risk of their being at blade height. Fog at night can cause migrating passerines to be attracted to lights and thus collide with turbines and nacelles;
- increase the diurnal visibility of the rotor blade by painting the blades in contrasting colors for at least 20% of the turbines in the wind farm;
- develop and implement a shutdown turbine program, whether the results of the monitoring will show significant number of mortalities due to the bird collisions with turbines. The shutdown program shall define the turn off of a certain turbines, or even the entire wind farm, over certain periods of time (e.g. peak periods of migrations, or before extreme weather forecasts of storms, fog, etc.). The shutdown system may include a combination of human observers and radar systems to give early warning of approaching migrant flocks. A bird-tracking radar system will be set up in case of excess mortality (i.e. to exceed a negligible magnitude effect, defined as a 1%

increase over the existing baseline mortality, as per SNH, 2002, assessment methodology) at an appropriate location giving the radar a view over the main migration route into the site The radar system will include a horizontally-mounted surveillance radar to track bird flight paths and a vertically-mounted radar to measure flight heights.

Bats - wind farm construction:

- respect a minimum distance of 200 m from forested areas;
- no construction at night;
- carry out the construction work in time intervals which allow the reduction of the noise, vibration, lighting and other disturbance on bats.

Bats - wind farm operation:

- develop and implement a shutdown turbine program, whether the results of the monitoring will show significant number of mortalities due to the bird collisions with turbines (i.e. to exceed a negligible magnitude effect, defined as a 1% increase over the existing baseline mortality, as per SNH, 2002, assessment methodology). Indeed, restrictions regarding the operation of the wind farm may be introduced during peak bat activity, such as during the autumn migration;
- it is recommended that the turbines start operating at medium to high wind intensities during nighttime, since that bat mortality is generally recorded during nights when the wind velocity is low, as they are active in search of food;
- reduce the negative effects produced by turbine lighting (light attracts insects which, in turn, attract bats), nighttime lighting for the turbines using projectors or powerful lights with continuous lighting which can attract insects in large numbers, which in turn may cause some bat species to fly into the turbine blade action radius. Turbine towers will be fitted with a red flashing light with large time intervals between two consecutive ignitions: this is likely to make them more visible at night and at fog presence (during both day and night) and therefore is less likely to be flown into by bats.

All these above described measures are captured within the Environmental and Social Action Plan (ESAP).

4.4 Monitoring

Birds and bats monitoring campaigns, as already planned, should be carried out during the construction works and operation, in line with the permits requirements, the EU requirements and the best international standards.

Main aim of monitoring is to verify conclusions regarding potential risk, assess the effectiveness of the mitigations and, if necessary, to refine these. Nevertheless, monitoring should specifically control and follow any change in the behavior of the species observed

and to better understand the trends of these species and eventual alterations due to the wind farm presence.

During operation, monitoring activities will include also dedicated monitoring activities of bat and bird mortality at all turbines and at wind mast, with emphasis on migration and breeding seasons.

All monitoring activities are captured within the Environmental and Social Action Plan (ESAP).

5 Summary and conclusions

This section presents the main conclusions of the additional information on ecological and landscape visual impacts, including potential cumulative impacts, associated with the Topolog-Luminita-Mesture wind farm that are prepared to fulfill EU requirements, in addition to the existing EIA documents and the Appropriate Assessment submitted in 2008 and in 2010.

This report is part of the ESIA disclosure package for public consultation of the project, along with the original Romanian environmental reports i.e. the two EIA reports and the Appropriate Assessment study, and the new documents, i.e. the Additional Study, the Environmental and Social Action Plan (ESAP), Stakeholder Engagement Plan (SEP) and Non-Technical Summary (NTS).

5.1 Landscape and visual impact assessment

Landscape impact assessment already included in the EIA reports has been supplemented by a production of a Zone of Theoretical Visibility map and some photomontages in order to further assess the impacts upon the landscape and visual amenity.

It is evident from the Zone of Theoretical Visibility map that whilst the proposed turbines are visible from the most of surroundings of the project area, the visibility is obstructed from the forest at the north-east quadrant, considered as potential area of interest for its conservation status.

A number of key receptors, presented as viewpoints for the purposes of the assessment, has been identified and consists of villages and main traffic and transportation routes. Viewpoint photomontages show that the project would be visible from a number of viewpoints however the open character of the proposed wind farm and their general uniformity of colour and design enable the developments to relate well to the receiving open and expansive landscape character of the site. Therefore the introduction of wind turbines and its ancillary infrastructure will not adversely impact upon the local landscape character beyond the local context.

Mitigation measures are proposed which will serve to minimize the landscape and visual impacts of the project and include, the avoidance of felling and/or severance of existing shelterbelts and selection of a turbine colour which would typically be a semi matt pale grey which would have the least visual impact on the landscape when seen against the sky for the most part.

5.2 Appropriate assessment

A review of the existing Appropriate Assessment of 2010 against the EU Habitats and Wild Birds Directives showed that the data on the ecological baseline and the impacts evaluation on birds and bats were not quite compliant with the EU requirements requiring therefore additional analyses. In details:

- no landscape and visual impacts assessment was provided in two EIA reports, therefore supplementary analyses supported by photo renderings of the wind farm,

also taking into account the cumulative effects with other existing projects, were considered as necessary;

- no comprehensive compliance with the criteria of the EU Habitats Directive was showed in the existing Appropriate Assessment of 2010 with regard to the ecological baseline and the impacts evaluation on birds and bats. As consequence, additional studies were required to meet the EU requirements on the protected species.

In the following main conclusions on the data of the ecological baseline and impacts evaluation on birds and bats are referred.

Ecological baseline

Considering the full set of available data from monitoring (2006-2013), the diversity of the fauna is strongly correlated to the diversity of the habitats in the studied area. Given that agroecosystems are predominant, the area is populated mainly by characteristic species, featuring specific adaptations.

Based on their affinity to certain types of habitat, bird species can be classified along the following ecological categories:

- Species which prefer arboreous vegetation (wooded areas and orchards) as a feeding, sheltering and breeding habitat, such as *Dendrocopus major* (Greater Spotted Woodpecker) and *Dendrocopus medius* (Middle Spotted Woodpecker).
- Species nesting in forested areas, but reaching agricultural land and pastures in search for food. Characteristic of this group are raptor species, diurnal and nocturnal, as well as many Passeriformes.
- Small insectivorous and granivorous species, having a preference for open fields, dominated by herbaceous vegetation, as feeding and breeding habitats, such as *Oenanthe oenanthe* (Wheatear)*, Anthus campestris* (Tawny Pipit), *Alauda arvensis* (Eurasian Skylark)*, Calandrella brachydactyla* (Short-toed Lark), *Melanocorypha calandra* (Calandra Lark).
- Species which prefer shrubbery as shelter and breeding habitat, but open fields for feeding habitat, such as: *Lanius collurio* (Red-backed Shrike), *Lanius minor* (Lesser Grey Shrike), *Carduelis carduelis* (Goldfinch), *Miliaria calandra* (Corn-Bunting), *Emberiza citrinella* (Yellowhammer)*.*
- Usually insectivorous species nesting along loess ravines: *Coracias garrulus* (Roller)*, Hirundo rustica* (Barn Swallow) and *Merops apiaster* (Bee-eater)*.*
- Synanthropic species, characteristic of inhabited areas, typically exhibiting high levels of adaptability to the anthropic factor, such that the population size of these species is the largest one within the studied area. Among these, *Corvus frugilegus* (Rook)*, Corvus cornix* (Hooded Crow)*, Corvus monedula (*Western Jackdaw)*, Hirundo rustica* (Barn Swallow)*, Passer domesticus* (House Sparrow)*, Passer montanus* (Eurasian Tree Sparrow)*, Sturnus vulgaris* (Rose-coloured Starling), *Streptopelia decaocto* (Eurasian Collared Dove) are noteworthy*.*

More recent observations and elaborations of statistic data confirm that the wind farm is in a peripheral area of the Pontica fly route with a limited flux of non-raptors birds (such as

Ciconia ciconia - White Stork- or *Pelecanus onocrotalus* - White Pelican). Furthermore, the area appears attractive for several species of raptors, both resident and migrant.

Regarding bats population, the number of observations in the area were very low and bat populations were mostly concentrated in ecotonal areas (which are a narrow belt nearest the wooded area), where the micro-climate and habitat conditions were favorable to the bats. Otherwise within the wind farm area, the trophic offer for chiropters was lower, weather conditions were unfavorable and the distance towards day shelters was relatively high.

Impacts evaluation and mitigation/compensation measures

Considering the full set of available data (the existing Appropriate Assessment of 2010 and the new Additional Study), residual adverse impacts – after the implementation of envisaged mitigation/compensations measures – on protected species and conservation objectives on 2000 sites are considered not significant.

Mitigation/compensation measures have to be implemented during construction and operation in order to reduce the potential impacts evaluated on some of the target birds and bats species potentially affected.

In order to verify the effectiveness of the mitigations and re-design/refine these measures, if necessary, birds and bats monitoring campaigns, as already planned in line with environmental Romanian permits, EU requirements and the best international standards, will be carried out during construction and operation. In addition, during operation monitoring activities will include also dedicated monitoring activities of bat and bird mortality at all turbines and at wind mast.

All these above described measures (both monitoring and mitigation/compensation) are captured within the Environmental and Social Action Plan (ESAP).

5.3 Conclusion

The supplementary investigations confirmed that:

- the proposed wind farms, with the implementation of best international industry practices and reqired mitigation/compensation measures, will not adversely impact upon the local landscape character beyond the local context.
- given the wind farm layout and the location of the wind farm in a peripheral area of the Via Pontica migration flyroute, and considering mitigation/compensation measures, the farm is not expected to contribute towards a significant residual or cumulative effect upon birds and the integrity of the two Natura 2000 sites. Furthermore, monitoring, already planned, will be carried out throughout the project cycle to verify this conclusion and the effectiveness of the mitigations/compensations;
- given the low density of bat populations present in the project area and its surroundings, potential impacts on bats species are considered not significant. However, proper mitigation measures will be implemented to reduce potential impacts.

All the mitigations/compensations measures are captured in the annexed Environmental and Social Action Plan (ESAP).

Appendices

Appendix 1

Project layout

Appendix 2

Zone of theoretical visibility and Photomontages

Appendix 3

Spring 2013 Monitoring Report – AS ORIMEX

Appendix 4

Additional Study on the Appropriate Assessment – AS ORIMEX