

PART 3: Terms of Reference (ToR)

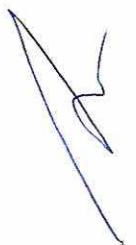


WIND PARK BOGDANCI, MACEDONIA

THREE YEAR POST-CONSTRUCTION AVIAN and BAT MONITORING

TERMS of REFERENCE (TOR)

January, 2016



Programme for Energy Efficiency and Renewable Energies II
Post-construction Avian and Bat Monitoring – WP Bogdanci / Macedonia

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1. Introduction

JSC Macedonian Power Plants (AD ELEM) was established in September 2005 as one of the successor companies of the former electric power utility ESM AD Skopje and holds a 35-year generation license granted by the ERC in November 2005. JSC Macedonian Power Plants' main business lines are power generation and lignite extraction. The company owns and operates eight hydropower plants (554 MW), two thermal power plants (842 MW) and three coal mines or total installed capacity of 1.414,4 MW.

AD ELEM is undertaking substantial efforts to increase the national electricity power generation while contributing also to reduce greenhouse gas emissions. Production of additional 100GWh by implementing the first wind park in the Republic of Macedonia was in line with the goal. Taking into account available financial resources, it was agreed to install the wind park in two phases: the first phase with 36.8 MW and an annual net production of 100 GWh and a second phase with the remaining 13.8 MW and an additional net production of 37 GWh, developed at the side near the city of Bogdanci. The turn-key project included all required works including instalment of turbines, MV Transformers stations, grid access substation, network connections etc., including necessary civil works (foundations, hard stands, roads and control building). The Project was registered as a CDM Project at UNFCCC in 2012.

JSC Macedonian Power Plants targeted to balance demand and production, and produce additional 100 GWh/year (2% of JSC Macedonian Power Plants yearly overall production) of electricity from wind energy by year 2013, and hereby contribute to reduce emissions of carbon dioxide (approx. 90,000 tCO₂/year) and other greenhouse gases; thus, joining to the EU in fulfilling commitment under the Kyoto Protocol.

Project Development

JSC Macedonian Power Plants started work in the field of wind energy in 2005 with a resource estimation campaign, supported by USAID and the US company AWS Truewind. A wind atlas for Macedonia was generated using a meso-scale wind flow model and topographic data for the entire country. Potential wind park sites were then pre-selected for wind speeds at 80 m above ground,.

In 2006, JSC Macedonian Power Plants installed four wind measuring stations in different parts of the country, this time with the help of a Norwegian utility company. A thorough evaluation of wind data in 2008 revealed that only one site had suitable wind resources and was large enough to install a wind park with an annual generation of 100 GWh (size of wind park estimated at > 40 MW).

Since the end of 2008 JSC Macedonian Power Plants wind energy activities have been supported by the Western Balkan Infrastructure Projects Facility (IPF), a component of the European Union programme CARDS (Community Assistance for Reconstruction, Development and Stabilisation). The programme's broader objective was to support the participation of the countries of the Western Balkans in the Stabilisation and Association Process (SAP). The IPF is being implemented by the consulting firm WYG International from the United Kingdom.

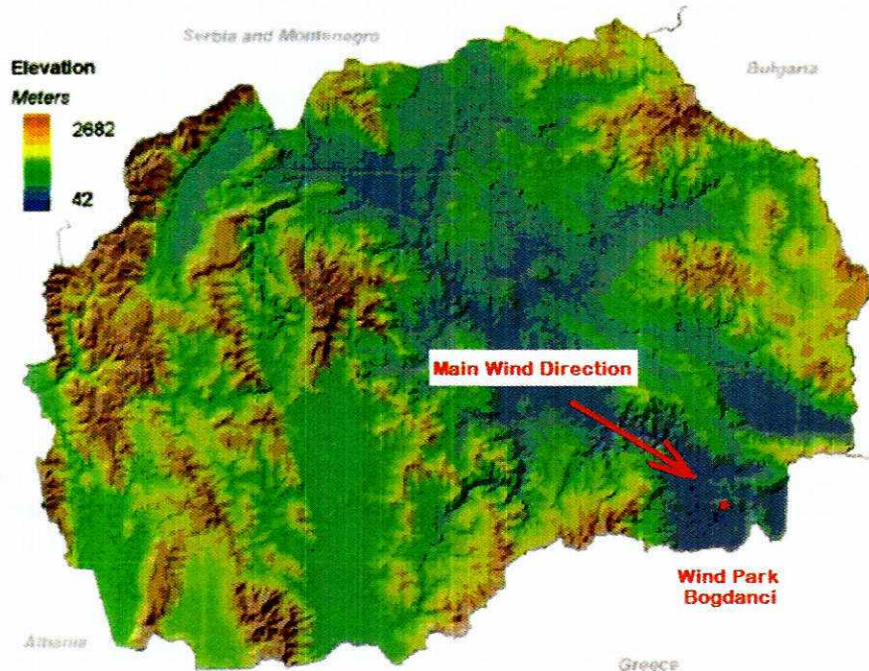
One of the main goals of this project, as Pilot project-first of its kind in the country, was to go through the entire legal procedure for construction of wind parks and to represent positive signal for all interested investors. Due to this reasons, and in accordance with existing legislation, JSC ELEM prepared and/or provided all necessary basic documents, such as: Analysis of impact of WP Bogdanci at the grid of Macedonian TSO MEPSO, completed by MEPSO in February 2010, Study for Geological and geotechnical survey of the terrain,

Preliminary Design for Wind Park – Bogdanci, as well as Feasibility Study and ESIA- Environmental and Social Impact Assessment Study, approved by the Ministry of Environment and Physical Planning in 2011.

Project Site

The project site lies in the south-eastern part of Macedonia, close to the border with Greece. It benefits from the dominant regional wind system, which follows the Vardar river valley from NW to SE through Macedonia (see Figure 1 - topographic map of Macedonia below). As the prevailing Vardar valley wind has to pass over the wind park site on a small group of hills with elevations between 250 and 500 m above sea level, its speed increases and reaches average annual wind speeds at least 2 m/s above that of the wind in the valley.

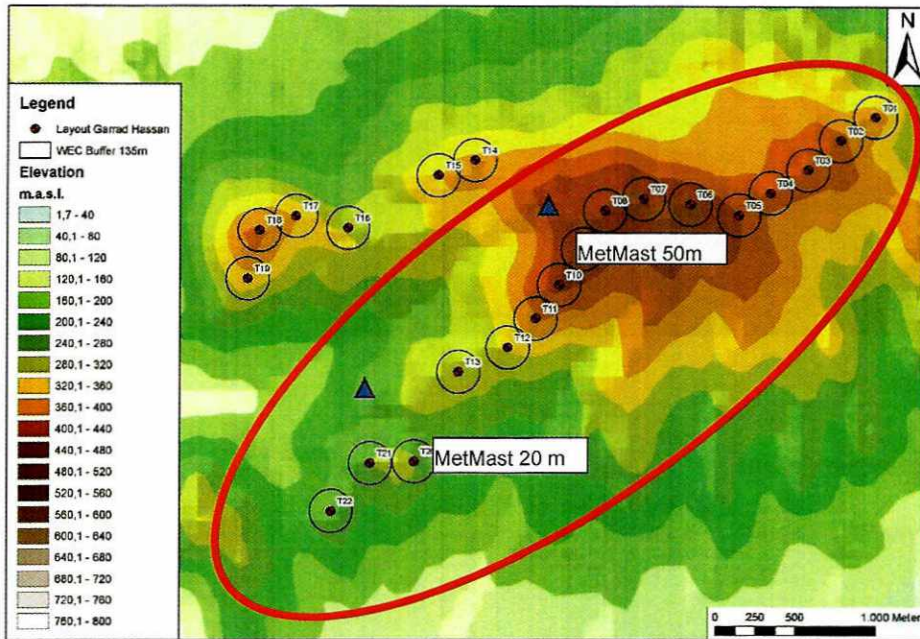
Figure 1:
Map of Macedonia indicating the Project Site



The project site was selected following extensive evaluation of wind data and the carrying out of two wind measuring campaigns, the first lasting 3.5 years (42 months) and covering a large area of the country (4 wind measuring stations with 50 m high towers). The second focussed on the most promising region in the SE of Macedonia and covers 4 potential wind park sites. Having provided sufficient data for a correlation with long-term data and allowing a definitive site decision, this measuring campaign is currently ongoing, to gather additional wind data for future project development.

Figure 2:

Wind park area and Micrositing for 22 x 2,3 MW turbines from which in phase one only the lower row was constructed (16 x 2,3MW) (marked in red)



The average wind speed measured during the measurement campaign is 7 m/s at 50 m above ground and features relatively little monthly variation throughout the year with a minimum monthly wind speed of just below 6 and a maximum monthly average wind speed of 8.3 m/s. For 9 months of the year, the average monthly wind speed is between 6 and 8 m/s. The project site is located approx. 7 km from the public road network (at the town of Bogdanci to the south of the Bogdanci wind park area) and 5.5 km away from the nearest 110 kV high voltage network, sufficient to absorb the generated electricity of the wind park.

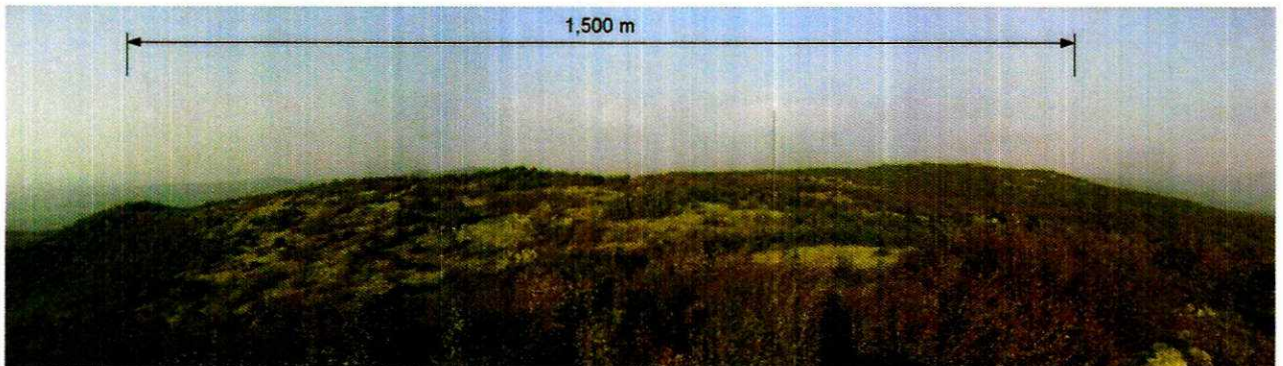
The connection substation is Valandovo, lying at a distance of 11.8 km to the wind park substation. A thorough Environmental Impact Assessment (EIA) and a Social Impact Analysis (SIA) have been carried out for the wind park site and no constraints to the development of the wind park in Bogdanci had been identified.

The entire wind park area is government-owned land, and is not currently used for agricultural or other purposes. The vegetation cover classifies the wind park area as shrubland (**Figure 3**).

No conflicting land uses have been identified during the extensive Environmental and Social Impact Assessment of the site.

The access road network for the project has a total length of ca. 19 km, of which 7.5 km is the main road connecting the wind park area with the public road network, the rest are internal roads leading to the individual wind turbines.

Figure 3:
Bogdanci – Central Ridge with 50 m Wind Measuring Tower



Project Implementation



The Project was realized during the period from 2012 – 2014.

Wind Park Description

The entire system comprises of 20kV cable line network, 20kV power plant, 2x25/40MVA ONAN/ONAF power transformers located at SS 20/110 kV "Bogdanci", 110kV transmission line "SS Bogdanci - SS Valandovo" for transmission of the electric power to the existing SS 110/35/10kV "Valandovo", actually being the point of connection to the National electric power transmission system operator (MEPSO), as well as access roads and platforms for installation of the wind turbines.

SS 110/20kV; 2x25/40MVA Bogdanci enables transformation and transmission of the generated electricity from the WP Bogdanci to the electric power system of Macedonia, through 11 km long 110 kV OHTL SS Bogdanci - SS Valandovo.

For this reason, in addition to the construction of a transformer station, a 110kV OHTL SS Bogdanci - SS Valandovo was constructed, which implied broadening the SS Valandovo by one 110kV transmission line bay, extending the existing 110kV bus-bar systems and providing room for one additional transmission line bay.

According to the technical requirements for the disposition of the wind turbines, positioned applying the minimal required distances in between, wind turbines are connected internally on 20 kV voltage level.

The current project consists of 16 Siemens wind turbines Type SWT - 2.3 - 93.

A project's Environmental Management Plan (EMP) consisting of the set of mitigation and monitoring measures, criteria for their successful implementation and institutional measures to be taken during project implementation to eliminate adverse environmental and social impacts, offset them, or reduce them to acceptable levels has been developed as part of the project's Environmental and Social Impact Assessment (ESIA) process. It has been prepared to ensure that all relevant project stages are implemented in compliance with applicable Macedonian laws and regulations and KfW's Sustainability Guideline as well as in accordance with the results of the stakeholder consultations.

This EMP foresees a necessity to perform a post construction monitoring programme to assess eventual bird and bat mortality due to collision with the new structures in the project affected area – the wind turbines or to assess other specific impacts (effect on specific sites or areas of birds / bats importance). This monitoring is to be carried out during first three years of the project operation and is to be conducted by qualified specialists and experts according to adopted and approved methodology.

Following international agreements / documents are considered as relevant in relation to the foreseen post-construction monitoring:

- (i) "EU Birds Directive 2009/147/EC and Directive 92/43/EEC on the Conservation of natural habitats and of wild fauna and flora - Habitats Directive
- (ii) The Bern Convention's documents:
 - The Recommendation No. 109 (2004) of the Convention's Standing Committee, and
 - The document "Wind farms and Birds" (2003), prepared by Birdlife International
- (iii) The Bonn Convention Resolution No. 7.5 (2002),
- (iv) Eurobats Resolution 4.7 Wind turbines and bats (2003)
- (v) The Resolution No. 6.11 (MOP 6, Prague, 2010) of the London Agreement (Agreement on the Conservation of Populations of European Bats) - http://www.eurobats.org/sites/default/files/documents/pdf/Meeting_of_Parties/MoP6_Record_Annex14_Res_6_11_WindTurbines.pdf

- (vi) Guidelines for consideration of bats in wind farm projects. EUROBATS Publication Series No. 3 which is referred to in Resolution 6.11 - (http://www.eurobats.org/sites/default/files/documents/publications/publication_series/pubseries_no3_english.pdf)
- (vii) Guidelines for Surveillance and Monitoring of European Bats http://www.eurobats.org/sites/default/files/documents/publications/publication_series/pubseries_no5_english.pdf
- (viii) EU Guidance on wind energy development (in accordance with the EU legislation on nature conservation).

This monitoring is to be executed via appropriate methods in order to fulfil legal and environmental National and International requirements thus ensuring that eventual conflicts will be identified and appropriately addressed with mitigation measures during the project's operational phase.

2. Post-construction Monitoring Rationale

In general terms, there are two key reasons why post-construction monitoring of a wind park might be required:

- (1) To provide additional information about a topic area where uncertainty exists.
- (2) To provide information about the performance of a mitigation, offset or compensation measure.

The overall goal of the requested exercise is to determine the potential for the wind park to have an adverse impact on bird and bat species by characterizing the use of the site and surrounding area under a variety of environmental conditions throughout the year, and by estimating the mortality rate of birds and bats due to collisions and other effects associated with turbines. Where possible, data collected prior to construction should be compared to information collected during the post-construction period to determine what impact, if any, the project has on migrating and resident breeding and wintering birds and bats. Ultimately, information gained from pre- and post-construction studies will be used to identify mitigation measures that may be used to minimize direct and indirect impacts from project operation.

On behalf of the project developer (ELEM AD), the consultant will conduct post-construction studies to evaluate actual impacts to birds and bats at the project site during turbine operation. Standard post-construction studies include mortality surveys (searches for fatalities), bird habituation and avoidance studies (space use), and bat surveys with ultrasound audio-detection or radar detector. ELEM AD will coordinate with relevant stakeholders and landowners to ensure that the consultant's staff has full access to the site over the foreseen monitoring time period.

3. Main Post-construction Monitoring Objectives

Following main objectives are to be achieved during the required post-construction studies:

- To estimate actual direct impacts of the operating project in terms of mortality rates of birds (target species) and bats caused by collisions with the wind-turbines.
- To determine actual specific impacts / disturbance effects of the operating project on birds (target species) and bats (e.g. effect on a specific nest site or breeding area, breeding success,
- Barrier effect, disturbance of bat roosts, loss of hunting areas of bats, loss or disturbance of fly paths, etc.).
- To document relevant indirect impacts of the project operation in the form of disturbance /avoidance behavior of birds and bats in the project area.
- To propose additional mitigation strategy to address the actual impacts (if required).

4. Scope of Works

- (i) Development of a Post-construction Monitoring Programme, based on suitable methodology and best international practice
- (ii) Following specific surveys as part of the overall post-construction monitoring will need to be included (but not be limited to):
- Habitat surveys (examination (incl. mapping) of main habitat types in the vicinity of each turbine (up to 500 m)
 - Bird surveys
 - Breeding and resident birds
 - Define species of special interest (e.g. listed in Appendix I of the EU-Birds Directive, considered as endangered, vulnerable or at least near threatened)
 - Carry out site visits in order
 - a. to set up a list of all species recorded within an area of 500 m to each turbine (SA500)
 - b. to record and map territories/nest sites of all species of special interest within the SA500
- (iii) research birds/bats monitoring on the location of the future extension - 6 turbines (as presented in the above Figure 2).

Site visits have to be carried out during the breeding season of species of special interest (generally March to July). This has to be adapted in order to reliably cover activities of species of interest.

It is assumed that at least two site visits per month are required for gaining sufficient data. Depending on the extent of the SA500 possibly more than one day might be necessary per site visit for covering the entire study area.

Methodology to be used: observations and acoustic monitoring on transects, trying to cover the entire SA500.

Important information to be presented: amount of work, location of transects, total list of species, status of each species (breeding, foraging or passing), number of territories/nest sites (and abundance) of species of special interest within the SA500.

All target species (see below) recorded by chance during site visits have to be documented, too.

Target species considered to be prone to collision

- Define a list of target species (species considered to be prone to collision)
- Carry out vantage point counts (VPC; standardized observations) in order
 - a. to set up a list of all target species recorded within an area of 2,000 m to each turbine (SA2000)
 - b. to describe habitat use (spatial distribution of flights) of each target species within the SA2000
 - c. to record and quantify species-specific activity within the SA2000 and in the vicinity of turbines (250 m)

VPCs have to be carried out during the breeding season of target species (generally March to July). This has to be adapted in order to reliably cover activities of target species.

It is assumed that at least four vantage points (VP) are required to cover the entire SA2000. VPs have to be chosen parsimoniously in order to achieve maximum visibility by a minimum number of points. The exact number of VP's needs to be clarified during the inspection period (initial site visits).

As recommended by SNH² (2014) a minimum of 36 hours per VP is a standard for vantage point counts during breeding season (12 observation units each lasting 3 hours). Observation units have to be divided equally over the period of the survey (2-3 units per month).

Methodology to be used: visual observations using animal focus sampling (binocular, telescope).

Important information to be presented: weather conditions during VPCs, amount of work at each VP (time spent at each VP and time invested in standardized observation), temporal distribution of VPCs, location of VPs, total list of recorded target species, status of each target species (breeding, foraging or passing) within the SA2000, number and location of territories/nest sites of target species within the SA2000 (abundance), time each species was observed within the SA2000 and in the vicinity (250 m) of a turbine, flights paths of each target species (maps).

Migrating birds (in particular large soaring birds, e.g. raptors, storks, pelicans, cranes)

- Define a list of target species (species considered to be prone to collision)
- Carry out observations from fixed sites in order
 - a. to set up a list and to record abundance of all species migrating within an area of 2,000 m to each turbine (SA2000)
 - b. to describe spatial distribution of bird migration for all species and for each target species within the SA2000

The survey shall include both spring and autumn migration.

It is assumed that at least two observation sites are required to cover the entire SA2000.

For the survey on migrating birds a minimum of 5 days per month (during migration periods) and a minimum of 5 hours per day (2.5 hours per observation site) are required. Methodology to be used: observations using scan and focus sampling (binocular, telescope).

Important information to be presented: weather conditions during observations, amount of work at each observation site, location of observation sites, numbers of all recorded birds (species-specific), spatial distribution of bird migration within the SA2000, flights paths of each target species (maps), average altitude of recorded flights (three categories: below, in and over rotor swept area), overall migration rate and - for target species - species specific migration rates (birds/h).

Wintering birds

- As the area is not believed to act as an important wintering site for birds, no survey on wintering birds has to be conducted. However, this has to be reviewed by the Consultant.

² See: <http://www.snh.gov.uk/planning-and-development/renewable-energy/onshore-wind/windfarm-impactson-birds-guidance/> and in particular: <http://www.snh.gov.uk/docs/C278917.pdf>

Waterfowl

- As the area is not believed to act as an important site for waterfowl (The nearest lake is Lake Paljurci more than 4 km to the Southeast. Lake Dorjan is located more than 10 km to the East.), no waterfowl survey has to be conducted. However, this has to be reviewed by the Consultant.

Mortality studies as an additional approach (*only optional offer!*)

- Carry out corpse searches in order to gain additional information on collision risk of target species (in particular large soaring birds, e.g. raptors, storks, pelicans, cranes) The area around each turbine (up to 100 m) has to be controlled for dead birds once a week from early March to end of October.

As it is not the aim to calculate the total number of fatalities searches shall focus i) on large birds and ii) on areas in which a high detectability is ensured (i.e. areas with no or only low vegetation cover).

Bat survey

Recoding bat activity

- Bat activity at turbine height has to be continuously recorded in order to gain a reliable estimate for species-specific collision risk.
Recording shall be achieved by an automatic detector system, e.g. batcorder 3.0, AnaBat, AviSoft (see Brinkmann et al. 2011). As a representative sample, six to eight turbines shall be equipped by one detector system each. Measurements shall start with the end of bat's hibernation period (typically in February/March) and shall last until the start of the next hibernation period (typically in November/December).
Important information to be presented: system settings, species composition (total and turbine-specific), species-specific activity at turbine height (number of calls per night), temporal distribution of activity, relation between wind speed and activity (species-specific).

Bat roosts and colonies

- Carry out site visits within an area of 1,000 m to each turbine (SA1000) in order to identify areas which are highly suitable as a roosting site for bats and to detect bat roosts or colonies.
In a first step the entire SA1000 has to be visited during day to detect areas which are highly suitable as roosting sites for bats.
In a second step the identified areas have to be visited (minimum 4 visits per area in June/July) during dusk and dawn using an appropriate bat detector (e.g. Pettersson 240x).
Important information to be presented: location of suitable roosting areas, locations of recorded roosting sites or colonies, species and recorded bats near roosting sites.

Mortality studies

- Due to the lack of information on searcher efficiency, scavenger removal, low detectability in areas with high and complex vegetation, fatality searches do not allow a reliable assessment of collision risk for bats. Hence, no mortality searches have to be conducted.

5. Implementation Arrangements

The offering consultant enterprises have to familiarize themselves in detail with the project during the tendering phase. They have to clearly state in their offers whether or not they accept the concept of the project as given in the tender documentation. If the concept cannot be accepted the reasons have to be stated clearly and in detail.

The Project executing agency (PEA) will provide the Consultant, free of charge, with relevant data, information and documents at disposition of the PEA which the Consultant may reasonably request, e.g. details on wind park layout, technical data / specifications of wind turbines, any other planning information, legal requirements; permits needed and granted, public information etc. The PEA will arrange and facilitate meetings with relevant institutions and authorities as required and will provide in such context where possible and requested by the Consultant translation services which will be at the Consultant's expense.

The PEA will identify a point of contact for the Consultant, to facilitate easy implementation of this assignment. The consultant will also closely liaise with nominated financiers' specialists.

6. Deliverables (Reports / Tangible Results)

Following tangible results from the required post-construction monitoring are foreseen:

(1) Post-construction Monitoring Programme

The Consultant will submit a Post-construction Monitoring Programme which should identify and describe all types of necessary surveys foreseen in the above scope of works. This Programme should also include monitoring methods and approaches detailing the search regime, monitoring sectors, habituation surveys, bat acoustical monitoring, monitoring equipment, reporting techniques, and other aspects of a project's post-construction mortality study.

This Programme will also propose the scope, structure and the preferred format for the reporting (point (3) below).

(2) Separate environmental monitoring report for the location of the future extension.

This includes one (1) year monitoring and additional six (6) months for finalization of the Report. The dead-line for delivery of this report can be specified separately.

(3) Reporting

Not later than 30 days after commencement date of the Contract, the Consultant will draw up an **Inception Report**. This report shall contain inter alia the preliminary findings and an updated work plan. Further details of the content of this report will be agreed upon in due time between the PEA, KfW and the Consultant.

During his assignment the Consultant will draw up **quarterly Progress Reports** to inform the PEA and KfW about all matters of importance. These reports are to be submitted to the PEA and to KfW within four weeks after the end of the reporting period. They shall summarize the main activities of the consultant, the progress achieved during the reporting period, main problems encountered and the envisaged solutions to overcome the problems, the financial status of the programme, etc. Each report will contain an Executive Summary; further content of these reports will be agreed in due time between the PEA, KfW and the Consultant.

a. Annual Post-Construction Reports (Interim Reports)

These reports will provide a clear description of the used methodological approaches (incl. amount of field work) and an overview of the main findings of monitoring activities on annual level and will be based on seasonal aspects of the works conducted.

b. Final Post-Construction Report (Final Report)

This report will provide a clear description of the used methodological approaches (incl. amount of field work) and an overview of the main findings of monitoring activities conducted in time horizon of the overall three-year period.

Each of the aforementioned documents should be delivered in Macedonian and English language, in hard copy and in a commonly accepted electronic format (e.g. PDF). All reports have to be prepared in DIN A4 format; whereof one (1) hard copy in English has to be submitted to the PEA and KfW each and one (1) hard copy in Macedonian to the PEA. A separate volume in DIN A3 format is to be prepared containing all plans, drawings and photographs (if need be). For the final versions of reports no spiral binding is accepted. The title of the reports and identification of the specific volume has to be indicated on the spine of every final version.

The Consultant will be working in close co-operation with the PEA and will keep the liaison officer and his other counterparts continuously informed on the progress of the Project

7. Technical Capacity of Candidate Consultant (Firm)

- (i) The Consultant should be a consulting firm or a consortium of firms with relevant project experience in KfW's countries of operation, in particular Southeast Europe.
- (ii) The candidate consultant has worked as lead firm or key consortium member on at least 2 completed projects in the particular areas of expertise relevant to this ToR, i.e.: biodiversity survey / monitoring for investment projects. Relevant experience in Environmental Impact Assessments (EIAs) for investment projects in wind energy in Macedonia (Reference List for specific experience) will be considered as an advantage.
- (iii) Composition of the proposed expert team, as defined in the section on personnel requirements below.

8. Personnel Requirements

The Consultant shall provide adequate staff (in terms of expertise and time allocation) as well as the necessary equipment in order to complete efficiently all of the activities required under the scope of work and to finally achieve the specific and overall objectives of the required post-construction monitoring.

The Consultant shall provide personnel as per the minimum requirements described below.

Key Experts

All experts who have a crucial role in implementing the monitoring are referred to as key experts.

Each key expert must undertake to be available, able and willing to work for all the period foreseen for his/her input during the implementation of the tasks as indicated in the ToR. Copies of their CVs and the supporting documentation must be enclosed with the candidate's proposal. Each CV must be confined to 5 pages and only one CV should be provided for each position identified in the ToR.

Each key expert can be proposed on only one of key positions foreseen in this ToR.

1. Expert 1 – **Project Supervisor**, for the Consulting Supervision Activities and nominated by the Consulting or Consulting Joint Venture from the permanent staff of the foreign Consultant having appropriate experience and qualifications, including proactive team leading capacities.

Qualification and skills

- At least university degree in Natural, Technical or Environmental Science.
- 5 years of experience in management and implementation of the same - similar projects,
- good communication and management skills and capacity to negotiate and develop good relations at work, at highest level, fluent in English.

General professional experience

- Minimum 10 years of general professional experience in the environmental field.

Specific professional experience

- Experience as Project Supervisor / Project Manager on at least 3 energy projects and at least 3 wind park development project.
- Experience in coordinating / managing of biodiversity monitoring / survey is an advantage.

The Project Supervisor will be fully informed of and acquainted with the project activities, both within the consulting services and the works at site. He will also be fully responsible for e.g. for the quality control of the consulting services, supervision of project reporting to KfW (monthly and quarterly reports, Final Report), coordination between JV parties, if any and the cooperation with the Project Manager.

2. Key Expert 1 – **Project Manager**, responsible for the overall coordination and management of the project, for reporting, for quality assurance of all specified outputs and for cooperation with the ELEM AD, the National Authorities and the KfW, if necessary. He should be from the permanent staff of the Consultant, having appropriate experience and qualifications, including proactive team leading capacities.

Qualification and skills

- At least university degree in Natural, Technical or Environmental Science.
- 5 years of experience in management and implementation of the same - similar projects,
- good communication and management skills and capacity to negotiate and develop good relations at work, at highest level, fluent in English.

General professional experience

- Minimum 10 years of general professional experience in the environmental field.

Specific professional experience

- Authorized EIA expert– Certificate for passed examination for acquiring the status of EIA expert or by the MEPP for local experts will be considered as an advantage
- Minimum 5 years of experience in the field of implementation of environmental and social impact assessments in the Western Balkans region. Relevant experience in Macedonia will be considered as an advantage.
- Experience as a lead ESIA expert/ responsible EIA expert on at least 3 energy projects and at least 1 wind park development project.
- Experience in coordinating / managing of at least 1 biodiversity monitoring / survey.

The Project Manager will be the person responsible for the effective execution of the consulting services by closely cooperating with the Project Supervisor. He will be fully in charge of the specified management services, e.g. assistance during the entire project period including participating in surveys, organisation of initial kick-off meeting; supervision of project execution, preparation of reports, etc.

3. Key Expert 2 – **Nature Protection Expert**, responsible for the coordination of the team of sectorial specialists

Qualification and skills

- At least university degree in Natural or Environmental Science.

General professional experience

- Minimum 10 years of general professional experience in the environmental field.

Specific professional experience

- Minimum 5 years of experience in the field of implementation of nature protection legislation, applying the requirements of the acquis regarding the obligations from the Birds (ex 79/409/EEC, 2009/147/EC) and Habitats (92/43/EEC) Directives.
- Minimum 3 years of experience in the preparation and/or implementation of nature and biodiversity protection projects. Relevant experience in Macedonia will be considered as an advantage.

4. Key Expert(s) 3 – Sectorial specialists on (1) Birds and (2) BatsQualification and skills

- At least university degree in Natural Science.

General professional experience

- Minimum 5 years of general professional experience in the environmental field.

Specific professional experience

- Specialist on birds (Ornithologist)
 - Minimum 5 years of experience in SEE in the field of implementation of nature protection legislation, applying the requirements of the acquis regarding the obligations from the Birds Directive (ex 79/409/EEC, 2009/147/EC)
 - Minimum 2 years of experience in the preparation and/or implementation of bird surveys and/or monitoring programmes for birds. Relevant experience in Macedonia will be considered as an advantage.
- Specialist on bats (Chiropterologist)
 - Minimum 5 years of experience in SEE in the field of implementation of nature protection
 - Legislation - Minimum 2 years of experience in the preparation and/or implementation of bat surveys and/or monitoring programmes for bats. Relevant experience in Macedonia will be considered as an advantage.

5. Key Expert 4 – GIS / mapping specialistQualification and skills

- At least university degree in Natural, Technical or Environmental Science.

General professional experience

- Minimum 5 years of general professional experience in the environmental field.

Specific professional experience

- Minimum 3 years of experience related to Geographical Information Systems in projects for environment and biodiversity protection.

The Consultant's team of key experts, in close consultation with the Project Manager, will be responsible for the effective execution of the consulting tasks. The team may be nominated by the Consulting or the Consulting Joint Venture from the permanent staff of the foreign and or local Consultant having appropriate experience and qualifications.

9. Logistics and Timing

Project Location

The operational base for the PEA is Skopje. The Consultant shall organise his services for the pre-construction supervision in close consultation with PEA (transportation, temporary accommodation, communications, etc.).

Commencement date & Period of execution

The commencement date will be specified in the Commencement Order which will be issued by ELEM AD. The period of implementation of the post-construction monitoring will be three years from this date.

