

Terms of Reference

Bird Migration Study and Cumulative Effects Analysis

Spring and Autumn 2022

for

**Siemens Gamesa Renewable Energy
BOO Wind Power Plant 500 MW at Gulf of Suez**



RCREEE 

Regional Center for Renewable Energy and Energy Efficiency
المركز الإقليمي للطاقة المتجددة وكفاءة الطاقة

December 2021

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Technical Proposal Submission Form

To: Regional Center for Renewable Energy and Energy Efficiency
Address: Hydro Power Building (7th Floor) Block 11 - Piece 15, Melsa District
Ard El Golf, Nasr City, Cairo, Egypt
Date: 14th December 2021

Ladies/Gentlemen:

PROPOSAL: BIRD MIGRATION STUDY FOR SPRING AND AUTUMN 2022 AND CUMULATIVE EFFECTS ANALYSIS FOR SGRE BOO WIND POWER PROJECT 500 MW

We, the undersigned, offer to provide the consulting services for "Bird Migration Study for Spring and Autumn 2022 and Cumulative Effects Analysis (the "Assignment")" for The Regional Center for Renewable Energy and Energy Efficiency (RCREEE) (the "Client") who is for and on behalf of Siemens Gamesa Renewable Energy (SGRE) (the "Beneficiaries") BOO Wind Power Plant NIAT 500 MW at the Gulf of Suez in accordance with your Request for Proposal dated December 2021 based on the necessity to complete the monitoring of the bird migration at NIAT site for the 3rd year. We are hereby submitting our Proposal, which includes this Technical and Financial Proposals.

This proposal is valid and capable of acceptance for 3 months from the Deadline for Receipt of Proposals, being [1st March 2022] (the "Proposal Validity Date").

We shall not be entitled to amend or withdraw our Proposal before that date and, if RCREEE accepts this Proposal, we shall not be entitled to amend any part of our Proposal except as may be expressly agreed by RCREEE during contract finalization.

If the Contract for the provision of the services is entered into within one month of the Proposal Validity Date we undertake to make available staff based on proposed qualifications. Our Proposal is binding upon us, subject to any modifications and clarifications resulting from Contract finalization.

If our Proposal is chosen, we will execute the Contract within 3 working days of being called on to do so, after the period of Contract finalization and standstill concludes.

We understand you are not bound to accept any Proposal you receive.

Yours sincerely,

[Name Authorised Signatory]

[Title/Position]

[Date]

[Signature]

1 Introduction

The energy sector is a key driver for the socio-economic development of Egypt, representing around 13% of current GDP and thus making economic growth in the country contingent upon the security and stability of energy supply.

Since 2007, Egypt has experienced an energy supply deficit due to the rapid increase in energy consumption and the depletion of domestic oil and gas resources, shifting its position as a net hydrocarbon exporter for the last three decades to that of a net importer.

This has brought a set of challenges to the energy sector, including electricity shortages, caused in part by the decline of domestic gas production, as natural gas is the main source of electricity, accompanied by highly subsidized energy prices, with negative financial implications for already dwindling government revenues.

In response, the Government of Egypt (GoE) has taken bold steps to adopt an energy diversification strategy with increased development of renewable energy and implementation of energy efficiency, including assertive rehabilitation and maintenance programs in the power sector (IRENA, 2018).

To this extent, in 2013, the Arab Republic of Egypt (through the Ministry of Electricity and Renewable Energy) had developed and adopted the Integrated Sustainable Energy Strategy (ISES) 2015 – 2035, which provides an ambitious plan to increase the contribution of renewable energy to 20% of the electricity generated by the year 2022, of which 12% of wind power plants is foreseen, mostly in the Gulf of Suez (GoS) due to the wind characteristics in the area.

In that respect, the GoE issued the Renewable Energy Law (Decree Law 203/2014) to support the creation of a favourable economic environment for a significant increase in renewable energy investment in the country. The law sets the legal basis for the Build, Own and Operate (BOO) scheme to be implemented. Through the BOO mechanism, the Egyptian Electricity Transmission Company (EETC) invites private investors to submit their offers for solar and wind development projects, for specific capacities and the award will be made to that bidder with the lowest Kilowatt Hour (kWh) price. In addition, the GoE (through the New and Renewable Energy Authority (NREA)) provides the land for the investors.

Through the BOO mechanism, a direct proposal was submitted by Siemens Gamesa Renewable Energy to EETC for the development of a 500-Megawatt (MW) Wind Power Project in Red Sea Governorate (hereafter referred to as 'the Project'). The direct proposal was accepted pursuant to the Council of Ministers approval in the Cabinet meeting number 65, held on 21 November 2019.

Siemens Gamesa Renewable Energy established NIAT wind energy farm, a wholly owned Siemens Gamesa Renewable Energy Project, responsible for the development, execution, and ownership of the Project.

The Bird Migration Protocol signed among RCREEE, EEAA, EETC and NREA in 2015 enhances the common interest between qualified investors and the aforementioned parties through the development of a strategic framework for economic construction and operation of wind-power plants in the area with the least possible damage to the migratory soaring birds and the environment. RCREEE for and on behalf the Siemens Gamesa Renewable Energy (SGRE)

(hereafter referred to as “the Beneficiaries”) will be managing the process of conducting the Bird Migration Study (BMS) during spring and autumn 2022 and Cumulative Effects Analysis (CEA) based on the gathered data in 2021 and 2022 at the NIAT site.

2 Project Description

The Egyptian Government has made land available for the Developer for the 500MW Wind Power Project. The Project is located in the west of the GoS Coast and in the Red Sea Governorate with an area of 75 km² as presented in the figure 1.

In addition, it is important to note that the Project area is part of a 300km² Strategic Area that has been allocated by NREA for wind farm development Projects with a total capacity of 1,500 MW. Refer to Figure 2 for the Strategic Area location in relation to the Project site. An ESIA study has been undertaken for the 300km² area known as the “ESIA for an Area of 300km² at the Gulf of Suez” (Lahmeyer & Ecoda, 2013).



Figure 1: Project Location

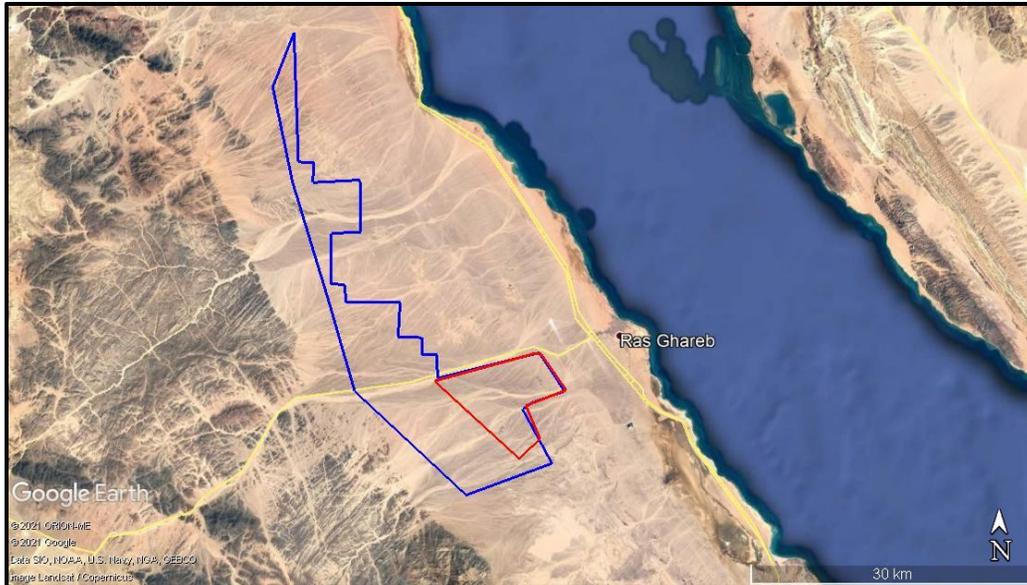


Figure 2: Project Site as Part of the 300km² Area

2.1 Key Stakeholders

The main stakeholders involved in this Bird Migration study are the Regional Center for Renewable Energy and Energy Efficiency (RCREEE) and Siemens Gamesa Renewable Energy.

2.1.1 Regional Center for Renewable Energy and Energy Efficiency (RCREEE)

The Regional Center for Renewable Energy and Energy Efficiency (RCREEE) is an intergovernmental organization with diplomatic status that was set up based on Cairo Declaration that was signed in June, 2008 by government representatives from Arab countries. The declaration outlined the following two core objectives for establishing the center:

- To diffuse the implementation of cost-effective renewable energy and energy efficiency policies, strategies and technologies in the Arab region.
- To increase the share of renewable energy and energy efficiency products and services in the Arab region and their share of global market.

RCREEE acquired its legal status in August, 2010 as an independent an intergovernmental organization with diplomatic status through a Host Country Agreement with the government of Egypt.

As the technical arm of the League of Arab States in renewable energy and energy efficiency, RCREEE strives to serve better its Member States while ensuring it's the effectiveness public service nature and mandate. Therefore, a number of new and innovative initiatives have been implemented or under-development to enable and increase the adoption of renewable energy and energy efficiency practices in the Arab region.

2.1.2 Siemens Gamesa Renewable Energy (SGRE)

SGRE is a fast-growing developer, owner and operator of renewable and thermal power projects across Africa, the Middle East and Asia. It has built a strong pipeline of projects across various technologies and at different stages of development in frontier and emerging markets, and is led by a highly experienced team with extensive and diversified international

experience in project development, finance and operations, and a successful track record in project execution.

SGRE is creating innovative and tailored solutions aimed at meeting the growing needs of the markets it serves. The SGRE team has also developed a deep understanding of the political and regulatory frameworks in its target countries and is experienced in structuring projects to meet best-in-class industry standards in order to mitigate emerging market risks. Consequently, the SGRE team is uniquely positioned to deploy its resources, expertise and capital in a fast, efficient and responsible manner.

SGRE benefits from broad regional access and a strong business network of leading industry partners. Furthermore, the company enjoys privileged access to own capital and has established long-term relationships with leading financial institutions, enabling it to promptly mobilize financing when needed.

3 Background and Objectives of the Assignment

Parts of the Gulf of Suez are well known as a bottleneck for migrating birds from Europe and western Asia, particularly the area near Gabel El-Zayt. Installing large wind farms in this region may lead to significant impacts on migrating birds posed by collisions with wind turbines or –to a lower degree – by barrier effects. In addition to this, roosting and local birds by direct habitat degradation or indirect disturbance (due to avoidance behaviour of birds) might be affected by huge wind farms.

On that abovementioned background and incorporation of environmental considerations due to bird migration in an operational plan of developing multiple wind-farm projects within Gulf of Suez, an extensive monitoring on birds within Project Area (see Figure 1 and Table 1) shall be conducted in spring and autumn migration seasons 2022.

4 Scope of Services, Tasks and Expected Deliverables

The services will consist of the BMS in Spring and Autumn 2022 and the CEA within Project Area. The BMS and the CEA of SGRE 500 MW BOO wind farm in the Gulf of Suez shall follow the Egyptian Environmental laws, regulations and guidelines and shall be complied in accordance with Egyptian E&S Policy (2014), with European Union Strategic Environmental Assessment Directives, with Egyptian Law no. 4/1994 for the Protection of the Environment Amended by Law 9/2009 complemented by the 2010 Environmental Impact Assessment (EIA) guidelines issued by the Egyptian Environmental Affairs Agency (EEAA) and with the Environmental Impact Assessment Guidelines and Monitoring Protocols for Wind Energy Development Projects along the Rift Valley/Red Sea Flyway (EEAA 2013). At the same time, this study shall keep the minimum standards of the Equator Principles are kept. This is to fulfil financing conditions of relevant international financing institutes that have committed themselves to keep the Equator Principles as minimum environmental standards.

4.1 Fieldwork for the Baseline Bird Study

The objective of the baseline bird study in 2022 is to provide field-based documentation of the overall patterns of migration of soaring migrants across the Project Area designated for wind turbines and to evaluate the possible collision risks. The focus of the baseline study will be on soaring migrants (identifying species, numbers, flying routes and roosting sites, spatial and temporal distribution of migration (seasonal and daily patterns), etc.), since they are most at risk of colliding with wind turbines in the Project Area. However, during the fieldwork, important breeding and roosting areas for birds should be identified. The BMS should cover

the entire spring and autumn migration seasons (20th of February – 20th of May 2022 and 10th of August – 10th of November 2022).

The Consultant shall provide:

- Comprehensive action plan depending on the EIA guidelines and monitoring protocols developed by EEAA (The EIA guidelines and monitoring protocols is the milestone of the study).
- Qualified methodology complying with and complementary to the Monitoring Protocols developed by the EEAA and a technical set-up of all field activities.
- Organization of field workers, field equipment and all logistical support for the field survey.

Comprehensive field survey of migrating birds from 20th of February to 20th of May 2022 and from 10th of August to 10th of November 2022.

The assessment will use specific pre-assigned eight Vantage Points (VPs) conducted in 2021 at the NIAT site that will be used throughout the coming two bird migration seasons in 2022 in order to achieve the objectives of the monitoring. Each VP will be covering a view of 360 degrees extending for a maximum of 2.5 km that should be sufficient for a qualified bird observer to identify the bird into the species level in good visibility conditions. The field assessment team will be composed of 4 qualified senior observers with adequate previous experience in avifaunal assessments for wind farms. Each VP will be covered by a single observer over observation periods that would cover the predicted peaks of migration. Besides, at least 4 junior observers will be joining the qualified senior observers during peak migration periods of each season for a maximum of 30-40 days per season for each junior observer.

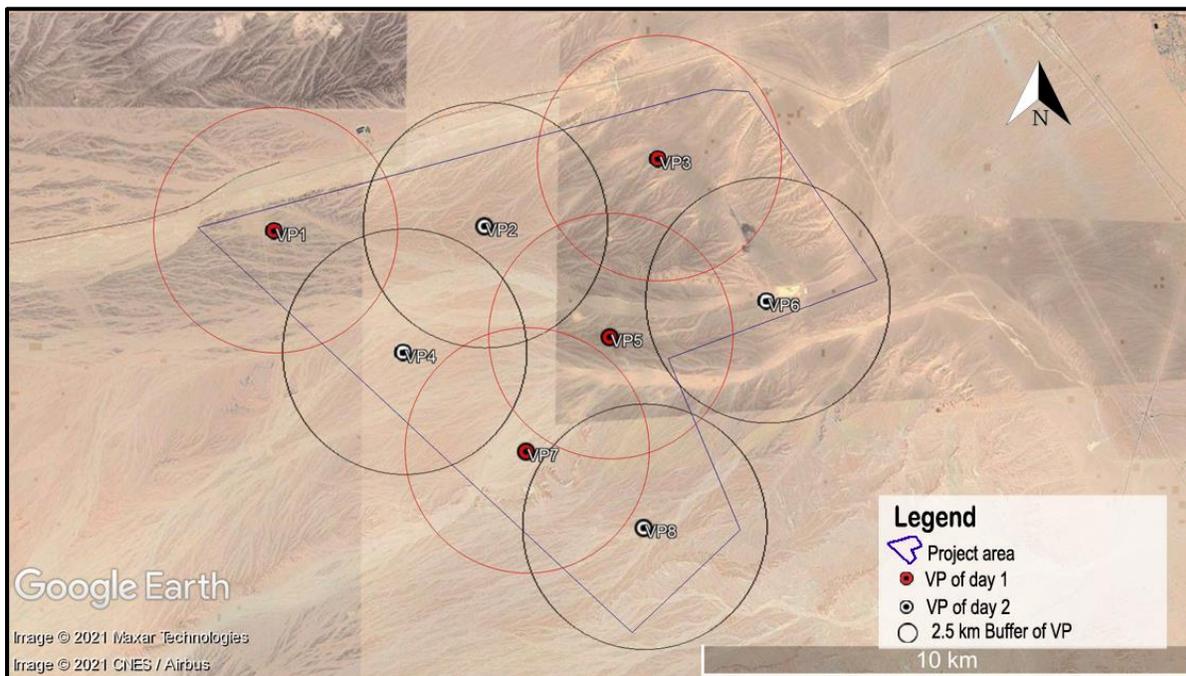


Figure 3 Locations of Conducted Observation Points

Table 1 : Coordinates of conducted observation points of NIAT 500 MW Wind Project

Vantage Points	Coordinates	
	Latitude	Longitude
VP1	28.308154°	32.896304°
VP 2	28.309387°	32.940133°
VP 3	28.321937°	32.976344°
VP 4	28.285994°	32.923485°
VP 5	28.289178°	32.966472°
VP 6	28.295956°	32.999225°
VP 7	28.268039°	32.949214°
VP 8	28.254166°	32.973881°

4.2 Bird Migration Study

Consultant shall identify all relevant options and techniques for implementing the BMS in within Project Area to generate the necessary knowledge for devising the relevant mitigation measures to ensure the least negative environmental when developing wind farm in the Project Area because of bird migration. This will include:

- Performing a comprehensive review of available data in the Project Area on:
 - Natural values: Distribution of migrating and resident birds, vulnerable species of other species groups, vulnerable habitats and protected areas (e.g. National Parks, Important Bird Areas and other protected areas). The distribution of birds will be based on information from previous studies in the Gulf of Suez area, fieldwork conducted throughout 2016 - 2021 and from a thoroughly update of published information from the scientific literature (in particular studies using satellite-based tracking of a number key species).
- Conducting a data gap analysis based on desk review of available data, in order to identify what data is needed for the Study.
- Determining the likely extent (spatial, temporal and thematic) of the Study, the level of detail that will be needed for the assessment, and identifying what information will be included in the BMS report.

The Consultant shall assess the following possible impacts from wind turbines within the Project Area:

- Habitat loss, habitat fragmentation, habitat degradation or disturbance/displacement of vulnerable species.
- Evaluate possible impact on migratory birds through a sampling from entire area with same methodology, the migration across the entire Project Area with a description of key-characteristics: Species composition and the variation in numbers and flight-altitude both from north to south and from east to west.
- Identify important roosting and breeding sites/habitats for vulnerable, critically endangered or endangered species and map all relevant species.
- Ornithological survey which should include and not limited to the following:

- Describe main soaring bird species migrating through the area, numbers, migration routes, timing of migration (each species individually), conservation status and including any other pertinent information.
- Identify, describe and map main migration routes for soaring birds through the area.
- Analyze and prioritize gaps in existing knowledge about species, migration routes.
- Identify and describe the main threats to migratory soaring birds in the area, and specify and describe the (existing or planned) risks and concerns for migratory soaring birds from wind farms and related infrastructures.
- Map and zone areas of the risks for soaring birds in the area in addition to identifying the areas for greatest potential conflict with wind farms.
- Identify and map the sites needing further survey and assessment.
- Provide an overall map of the migration flyways of migratory soaring birds inside the designated area.
- Critical passes for birds into the wind farm.

4.3 Cumulative Effect Analysis

A Cumulative Effects Analysis (CEA) is a multi-layered analysis approach that aims at identifying and analysing the impacts of a set of projects on a pre-defined set of ecological elements; habitats and species. The CEA comes into context for the NIAT project since it is located in an area that includes multiple wind farms while being also located along a major bird migratory flyway, namely the Rift Valley Red Sea flyway. Although the impact of wind power project infrastructure on Migratory Soaring Birds (MSBs) is well documented, it should be highlighted that the CEA will not be limited to this context and will also take into consideration other ecological elements, including habitats and volant mammals (bats).

The CEA follows a series of multi-layered steps that would eventually identify the potential cumulative impacts of the projects of concern in order to eventually provide monitoring and mitigation measures that would be applied through an adaptive management approach. These steps would follow the approach that was developed under the Cumulative Effects Assessment for the RSWE project, which RCREEE has taken part in. These steps, in summary, are as follows:

- **Scoping**, which includes an initial review of existing data, preliminary engagement with stakeholders, including national experts, determining spatial and temporal boundaries of the CEA, and conducting a screening process to select Valued Social and Environmental Components (VECs).
- **Collection of supplementary data**, a huge amount of data has been collected over the years in the project area and its vicinity.
- **CEA Framework**, will be applied using a risk-based approach for birds, bats and habitats. The objective of which would be to identify priority VECs at highest risk of cumulative effects from the wind power projects so that mitigation and monitoring measures are put in place to implement an adaptive management approach. The framework will follow a five-step approach as follows:
 - a. *Identification of species populations that are potentially at risk,*
 - b. *Evaluate the sensitivity of these species (relative importance and vulnerability),*
 - c. *Assess the cumulative Likelihood of Effect (LoE) on each species population, resulting in the identification of priority VECs,*
 - d. *Determine fatality thresholds for each priority VEC,*

e. Produce a Mitigation and Monitoring Plan.

Access to Data, Consultant will access all available data collected at NIAT project site and vicinity sites during the previous spring and the autumn migration seasons, in addition to all available data of the ecological assessment that was collected as part of the ESIA for the project.

- **Timeframe,** the CEA will be presented as separate stand-alone documents. The Consultant is committed to providing a final CEA report by the 19th of December 2022 maximum.

4.4 Deliverables by the Consultant

- ✓ Review of current knowledge on bird-migration in the Gulf of Suez area to feed into the BMS and the CEA.
- ✓ The Bird Migration Assessment should include maps, which presents differences in possible impacts across the study area.
- ✓ Report on the ornithological baseline field-studies on the migration of soaring birds across the Project Area during spring and autumn migration seasons 2022. The studies must be based on qualified methodologies and using modern survey techniques.

Table 2 Reports during spring season 2022

Name of report	Content	Time of submission
<p>1. Minutes of kick-off Meeting for Spring Season 2022 (M1)</p>	<p>The objective of the kick-off meeting will be to discuss the following:</p> <ul style="list-style-type: none"> ▪ Communication plan for the project and key contacts on the BMS and the CEA ▪ Overall approach and methodology for the BMS and the CEA ▪ Overall timeline for the BMS and the CEA and deliverables/reporting requirements ▪ Structure for reports and presentations ▪ List of required information, data and reports for the BMS and the CEA. This will include information such as: (i) technical study for the Project, (ii) involved entities in the Project, (iii) description of Project components with 	<p>12th of January 2022</p>

	<p>maps and layout (if available), (iv) phasing and schedule of Project development, (v) workforce requirements, and any other supplemented data as applicable</p> <ul style="list-style-type: none"> ▪ Other comments and issues as applicable 	
2. Inception Report for Spring Season 2022 (D1)	Review of available documentation, analysis of existing situation and refinement of the work plan including methodologies for data analysis.	1 st of February 2022
3. Bimonthly Report for Spring Season 2022 (D2)	Progress report is a brief technical report on the field work and the BMS and the studies compilation for discussion and debriefing between the Client and the Consultant.	20 th of April 2022
4. Avifauna/Biodiversity Sensitivity Mapping Report for Spring Season 2022 (D3)	This report will provide an assessment of the NIAT site in relation to birds and biodiversity over the entire spring season 2022. Besides, this report will provide recommendations for considerations to be taken into account during the micro-siting and design of the Project.	2 nd of June 2022
5. PowerPoint Presentation Covering Bird Migration Season for Spring Season 2022 (P1)	Presentation of results on migrating, roosting and local birds in spring 2022.	6 th of June 2022
6. Cumulative Effects Analysis Report for Spring Season 2022 (D4)	This report will present the findings of a rapid analysis of the potential cumulative effects on avifauna and biodiversity of wind farm in development by NIAT Project at the Gulf of Suez, Egypt. The report should build on the findings of the Cumulative Effects Analysis that was undertaken for the	9 th of June 2022

	<p>WBWF, RSWE, AMUNET and RGWE projects. The analysis should identify priority bird Valued Environmental Components (VECs) and a preliminary list of other VECs. High-level mitigation and monitoring actions that will be adopted by NIAT project.</p>	
<p>7. Ornithological Field Monitoring Report for Spring Season 2022 (D5)</p>	<p>Review of available data on previous SESA and ESIA in Gulf of Suez relevant for the development of wind energy. The study must contain an analysis of previous studies of migratory soaring birds in the Gulf of Suez and Suez and identification of hypersensitive sites for the migrating birds that may negatively impacted with the existence of wind turbines in Project Area.</p> <p>Review of all current studies on migratory soaring birds crossing the Gulf of Suez.</p> <p>The draft report on BMS shall include general approach and schedule, data analysis of soaring bird migration in spring 2022, and the following variables should be determined (not limited to): weather conditions (temperature, wind speed and wind direction, cloud cover), visibility, kind of species, number of individuals, sex and/or age of individuals if possible, flight path (should be carefully mapped after commencement of the recording); main flight direction, flight altitude, behavioral variables, spatial and temporal migration patterns of MSB species in Project Area, determining the factors affecting the magnitude of migration of MSBs in Project Area</p>	<p>19th of June 2022.</p>

	<p>The BMS shall assess of the importance of the Project Area and impact assessment. Outline of the extent (spatial, temporal and thematic) of the BMS.</p>	
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Table 3 Reports during autumn season 2022

Name of report	Content	Time of submission
8. Minutes of kick-off Meeting Autumn 2022 (M2)	<p>The objective of the kick-off meeting will be to discuss the following:</p> <ul style="list-style-type: none"> ▪ Communication plan for the project and key contacts on the BMS and the CEA ▪ Overall approach and methodology for the BMS and the CEA ▪ Overall timeline for the BMS and the CEA and deliverables/reporting requirements ▪ Structure for reports and presentations ▪ List of required information, data and reports for the BMS and the CEA. This will include information such as: (i) technical study for the Project, (ii) involved entities in the Project, (iii) description of Project components with maps and layout (if available), (iv) phasing and schedule of Project development, (v) workforce requirements, and any other supplemented data as applicable 	27 th of July 2022

	<ul style="list-style-type: none"> Other comments and issues as applicable 	
9. Inception Report for Autumn Season 2022 (D6)	Review of available documentation, analysis of existing situation and refinement of the work plan including methodologies for data analysis.	1 st of August 2022
10. Bimonthly Report for Autumn Season 2022 (D7)	Progress report is a brief technical report on the field work and the BMS and the studies compilation for discussion and debriefing between the Client and the Consultant.	10 th of October 2022
11. PowerPoint Presentation Covering Bird Migration Season for Autumn Season 2022 (P2)	Presentation of results on migrating, roosting and local birds in autumn 2022.	15 th of November 2022
12. Ornithological Field Monitoring Report for Autumn Season 2022 (D8)	<p>Review of available data on previous SESA and ESIA in Gulf of Suez relevant for the development of wind energy. The study must contain an analysis of previous studies of migratory soaring birds in the Gulf of Suez and Suez and identification of hypersensitive sites for the migrating birds that may negatively impacted with the existence of wind turbines in Project Area.</p> <p>Review of all current studies on migratory soaring birds crossing the Gulf of Suez.</p> <p>The draft report on BMS shall include general approach and schedule, data analysis of soaring bird migration in spring 2022, and the following variables should be determined (not limited to): weather conditions (temperature, wind speed and wind direction, cloud cover), visibility, kind of species, number of individuals, sex and/or age of individuals if possible, flight path (should be carefully mapped after</p>	17 th of November 2022

	<p>commencement of the recording); main flight direction, flight altitude, behavioral variables, spatial and temporal migration patterns of MSB species in Project Area, determining the factors affecting the magnitude of migration of MSBs in Project Area</p> <p>The BMS shall assess of the importance of the Project Area and impact assessment.</p> <p>Outline of the extent (spatial, temporal and thematic) of the BMS.</p>	
<p>13. Cumulative Effects Analysis Report for Spring and Autumn Seasons 2022 (D9)</p>	<p>This report will present the findings of a rapid analysis of the potential cumulative effects on avifauna and biodiversity of wind farm in development by NIAT Project at the Gulf of Suez, Egypt. The report should build on the findings of the Cumulative Effects Analysis that was undertaken for the WBWF, RSWE, AMUNET and RGWE projects. The analysis should identify priority bird Valued Environmental Components (VECs) and a preliminary list of other VECs. High-level mitigation and monitoring actions that will be adopted by NIAT project.</p>	<p>19th of December 2022</p>
<p>14. Ornithological Field Monitoring Report for Spring and Autumn Seasons 2022 (D10)</p>	<p>Review of available data on previous SESA and ESIA in Gulf of Suez relevant for the development of wind energy. The study must contain an analysis of previous studies of migratory soaring birds in the Gulf of Suez and Suez and identification of hypersensitive sites for the migrating birds that may negatively impacted with the existence of wind turbines in Project Area.</p>	<p>19th of December 2022</p>

	<p>Review of all current studies on migratory soaring birds crossing the Gulf of Suez.</p> <p>The draft report on BMS shall include general approach and schedule, data analysis of soaring bird migration in spring and autumn 2022, and the following variables should be determined (not limited to):</p> <p>weather conditions (temperature, wind speed and wind direction, cloud cover), visibility, kind of species, number of individuals, sex and/or age of individuals if possible, flight path (should be carefully mapped after commencement of the recording); main flight direction, flight altitude, behavioral variables, spatial and temporal migration patterns of MSB species in Project Area, determining the factors affecting the magnitude of migration of MSBs in Project Area</p> <p>The BMS shall assess of the importance of the Project Area and impact assessment.</p> <p>Outline of the extent (spatial, temporal and thematic) of the BMS.</p>	
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All Deliverables (1, 2, 3, 4, 5, 6, 7, 8, 9 and 10) must be written in English. All reports are submitted in hard copy (6 copies of both D9 and D10) and in electronic format (both in .docx and .pdf format) to the Client.

5 Team Composition & Qualification Requirements for the Key Experts

A Project Manager will run the overall Assignment. Technical expert inputs on key topics of the project as wind resources, field surveys of birds must have more than 10 years of experience within their field and no less than 5 years of experience in similar required activities. Proposed expatriate staff must have experience outside their own country, preferably in conditions similar to those prevailing in the country of the assignment. An environmental expert should be registered with EEAA or initiate the process upon the Contract signature. A multi-disciplinary team of RCREEE will manage and follow up the whole project.

5.1 Key Expert 1

Project Manager (Senior), with overall responsibility for managing the Assignment, managing the relationship with RCREEE, and for the technical outputs of the Assignment as well as day-to-day management of the project including contact with RCREEE.

Qualifications and Skills

University degree (or equivalent) in Environmental Science (e.g. Biology, Environmental Management & Planning, Natural Resource Use). Good command of spoken and written English and Arabic.

General Professional Experience

Preferably 10 years' work experience in project management and SEIA and/or EIA of RE projects including pre- and post-construction monitoring, development of mitigation measures and public participation. Preferably 10 years' experience of working with interaction between birds and renewables, in particular studies of migratory birds (especially so-called soaring migrants).

Specific Professional Experience

Preferably 10 years' experience in capacity building, training and public participation. Preferably 5 years' experience in SEIA/EIA on renewable energy projects - Responsible for formulation of guidelines to development of renewable energy for the use of authorities and/or developers. Preferably 5 years' experience working in the Middle East.

5.2 Key Expert 2

Task Manager – Biodiversity (Senior), with overall responsibility for the scientific program and data analysis.

Qualifications and Skills

University degree (or equivalent) in Biology. Good command of spoken and written Arabic. Some knowledge of English will be an advantage.

General Professional Experience

Preferably 10 years' experience in survey of biological environments, including survey of migratory birds and habitats. Preferably 5 years' working experience in EIA of renewable energy projects.

Specific Professional Experience

Preferably 10 years professional experience of which 5 years in modern ornithological survey techniques At least 5 years' experience in data analysis and interpretation of biological data. Preferably minimum 3 years' professional experience of work in the Middle East.

5.3 Key Expert 3

Task Manager – Statistical Analysis (Senior), with overall responsibility for statistical analysis and experimental design, especially for general and general linear or mixed models and multivariate statistics.

Qualifications and Skills

University degree (or equivalent) in Biology.
Good command of spoken and written English.

General Professional Experience

Preferably 10 years' experience working in conducting multivariate statistical analysis, experimental design and data modeling.

Specific Professional Experience

Experience of collision risk modelling in relation to birds and wind farms. Experience in the Middle East. Working as statistical expert at center for environment is advantage.

Beside the key experts, the Assignment will involve other experts on a short-term basis if needed:

- ❖ **Expert on GIS:** Overall responsibility of GIS works (e.g. assisting in the development of data collection during field projects and analysis of all collected GIS data).
- ❖ **Expert on Habitats:** Responsible for interpretation on habitats.
- ❖ **Expert on Ornithological Field Surveys:** Field experts having an experience in practical field ornithology. The degree required expatriate ornithologists with high skills in bird identification and standardized data collection, both during visual observation and during radar-supported data-collection. High scientific quality control during data analysis, reporting of desk studies and bird migration studies.

6 RCREEE's Input

RCREEE will help in facilitating all security permits needed for working in the Project Area. RCREEE will coordinate with concerned government entities to help in providing available relevant studies, wind and topographical data for wind farm projects in the Project Area by the start of the project. RCREEE will provide professional relevant multi-disciplinary personnel to work with the Consultant's team for the follow up on the project implementation. RCREEE will coordinate with concerned government entities the formation of specialized committee to supervise the enrollment of the bird monitoring field work as well as the bird monitoring study in Project Area.

7 Data Management

7.1 Compilation of Storage

The Consultant will establish a database to store, retrieve, and organize field data. Data from field forms will be keyed into electronic data files, and all field data forms, field notebooks, and electronic data files will be retained.

7.2 Quality Assurance / Quality Control (QA /QC)

The Consultant shall implement QA/QC measures at all stages of monitoring including field data collection, data entry, data analysis, and report preparation. At the end of each survey day, each surveyor will inspect his or her data forms for completeness, accuracy, and legibility. Periodically, the study team leader will review data forms to insure completeness and legibility, and detected problems will be corrected. Any changes made to the data forms will be initialed and dated by the person making the change. Data will be checked thoroughly for data entry errors. Any errors will be corrected by referencing the raw data forms and/or consulting with the observer(s) who collected the data. Any irregular codes detected, or any data suspected as questionable, will be discussed with the observer and study team leader. Any changes made to the raw data will be documented for future reference.