



Final Report

Mid-Size Sustainable Energy Financing Facility (MidSEFF) Soma WPP Wind Power Plant: Non-Technical Summary (NTS)

June 2016



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European Bank for Reconstruction and Development

**Soma WPP Wind Power Plant:
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The European Bank for Reconstruction and Development (EBRD) launched in January 2011 a financing facility aimed at scaling up Renewable Energy and Energy Efficiency investments in Turkey, to increase the country's energy savings and decrease its carbon emissions. The Turkish Mid-Size Sustainable Energy Financing Facility (MidSEFF) launched by the EBRD with support from the European Investment Bank (EIB) and European Commission (source of the Technical Cooperation funds) will provide a total of EUR 1 billion in loans through 7 Turkish banks for on-lending to private sector borrowers.

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Acronyms

CIA	Cumulative Impact Assessment
dBA	decibel
EBRD	European Bank for Reconstruction and Development
EIA	Environmental Impact Assessment
EMRA	Energy Market Regulatory Authority
ESIA	Environmental & Social Impact Assessment
ETL	Energy Transmission Line
WPP	Wind Power Plant
LC	Least Concern
MidSEFF	Mid-Size Sustainable Energy Financing Facility
NTS	Non-Technical Summary
PC	Project Consultant
PDöEU	Provincial Directorate of Environment and Urbanization
PIR	Project Information Report
EIA	Environmental Impact Assessment Report
The Sponsor	Bilgin Enerji Yatırım Holding A.Ş.
The Sub-borrower	Bilgin Rüzgar Santrali Enerji Üretim A.Ş.
TS	Transfer Station
TÜİK	Turkish Statistical Institute
VIA	Visual Impact Assessment
VU	Vulnerable

1. General Plant Description

The Soma Wind Power Plant (WPP), with a capacity of 90 MW (36 wind turbines) was located in Soma and Kırkağaç district of Manisa Province and has been operational since August 2010. The Sponsor (Bilgin Enerji Yatırım Holding A.Ş.) proposed an extension project that consists of 10 additional turbines with a rated power of 3 MWe each and the Sub-borrower (Bilgin Rüzgar Santrali Enerji Üretim A.Ş.) has owned the total of additional 30 MWe installed power. The total installed capacity will be 120 MWe after extension.

The plant location including existing turbine locations with the extension ones is shown in Figure 1-1 and Figure 1-2.

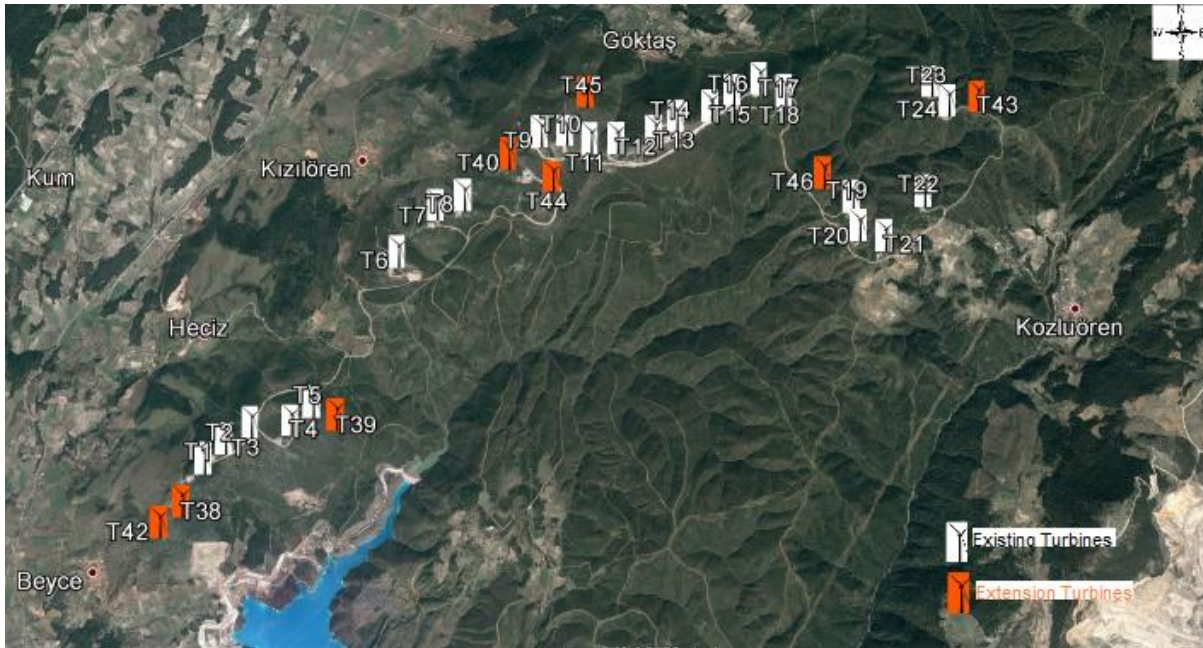


Figure 1-1: Location of the T38, T39, T40, T42, T43, T44, T45 and T46 Extension Turbines

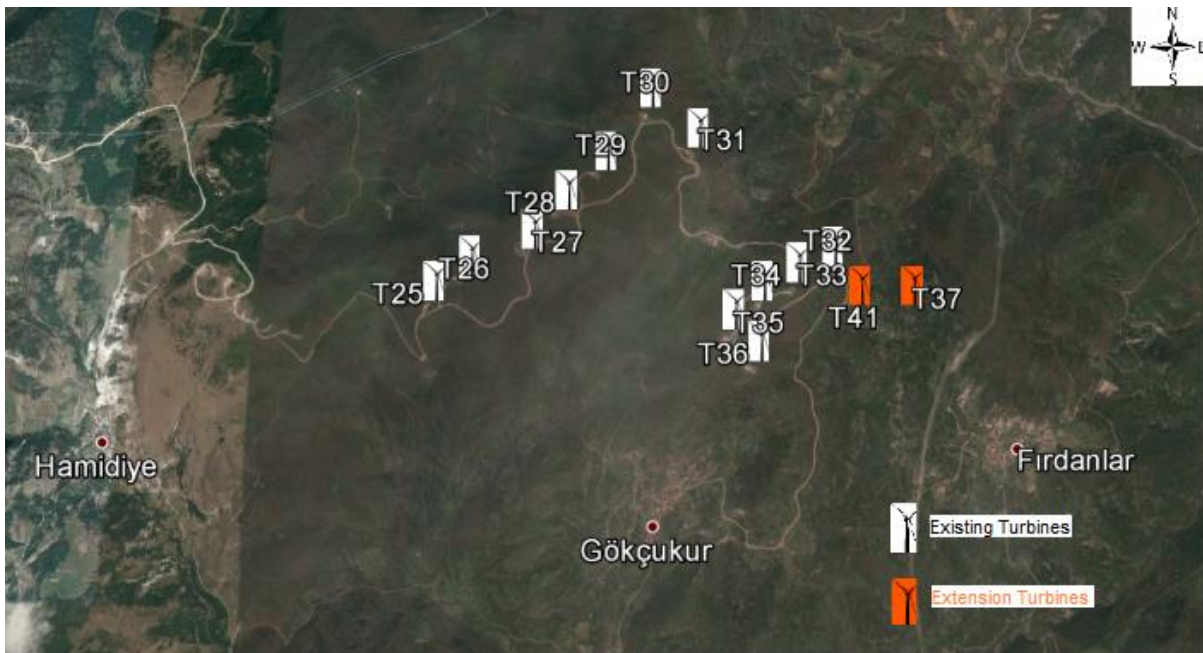


Figure 1-1: Location of the T37 and T41 Extension Turbines

The “EIA is not required” Certificate was secured from the Manisa Provincial Directorate of Environment and Urbanization (PDoEU) on 4th August 2015. The production license has been given by Energy Market Regulatory Authority (EMRA) on 17th July 2008 covering the total of 120 MWe installed power and lastly amended on 13th October 2014 for the extension project. The Soma WPP is connected to 154 kV Soma B Thermal Power Plant Transfer Station (TS). The existing infrastructure will be used for connection to the grid and there will be no need to construct a new ETL for the extension project.

The construction of extension project will be started in August 2016. The project will be in operation phase in November 2016. Table 1-1 presents the key aspects of the project.

Table 1-1: Key project summary data

Key Project Summary Data	
Project Borrower	Bilgin Rüzgar Santrali Enerji Üretim A.Ş.
Project Sponsor	Bilgin family and Bilgin Enerji Yatırım Holding A.Ş.
EBRD Transaction	The total project cost is EUR 29,521,717 including capitalized financing costs and working capital requirement. The proposed financial scheme includes debt financing in the amount of EUR 24,221,550 and the Borrower’s own contribution in the amount of EUR 5,300,167. The debt to equity ratio is approximately 82:18.
Project Description / Business Purpose:	<p>The location of the Soma WPP is the Aegean Region of Manisa Province Soma Borough, Kırkağaç district.</p> <p>The Sub-borrower will realize the extension investment by installing remaining facilities consisting of 10 turbines that will provide an additional 30 MWe installed power.</p> <p>The project will contribute to the share of renewable energy in the Turkish energy market. The generation of electricity from renewable source will replace the electricity from the national grid and enable the reduction of 64,725.6 tCO₂/year (calculated for base case scenario of electricity generation).</p>
Key Parties Involved:	<p>EBRD</p> <p>T.C. Garanti Bankası A.Ş.</p> <p>Bilgin Rüzgar Santrali Enerji Üretim A.Ş.</p>
Project Name	Soma WPP
Project Type	Wind Power Plant
Base Case Scenario:	
Installed Capacity	30 MWe
Annual Electricity Production	108.6 GWh (for the extension project)

2. Environmental and Social Baseline

2.1 Environmental description of the project area

The Soma WPP is located in Soma and Kırkağaç districts of Manisa Province. The plant is located in two separate areas. Part of the turbines are located on the hillside which is in Soma district, whereas the remaining turbines are located on the hillside which is located in Kırkağaç district.

The closest residential areas to the plant area are Beyce, Heciz, Kızılören, Göktaş, Kozluören, Hamidiye and Gökçukur villages. The distances between the closest turbines and these residential areas range from approximately 500 m to 2050 m.

The nearest Wind Power Plants to the project site are Soma WPP (that is owned by another energy generation company and has a capacity of 264,1 MW that is in operation) and Kocatepe WPP (the plant having a capacity of 25 MW is licensed but not put in operation yet). Both of these plants are approximately 20 km far away from the project site.

The project area is not located within a significant transition route of the birds in terms of the number of passes and the number of individuals when the turbine locations are evaluated together with the flight height and horizontal distance (Figure 2.1). The project site is not close to the main transition routes of the birds. Birds visit the surroundings of the WPP site only for daily food search, resting and trans passing. The project site is not an important breeding area.

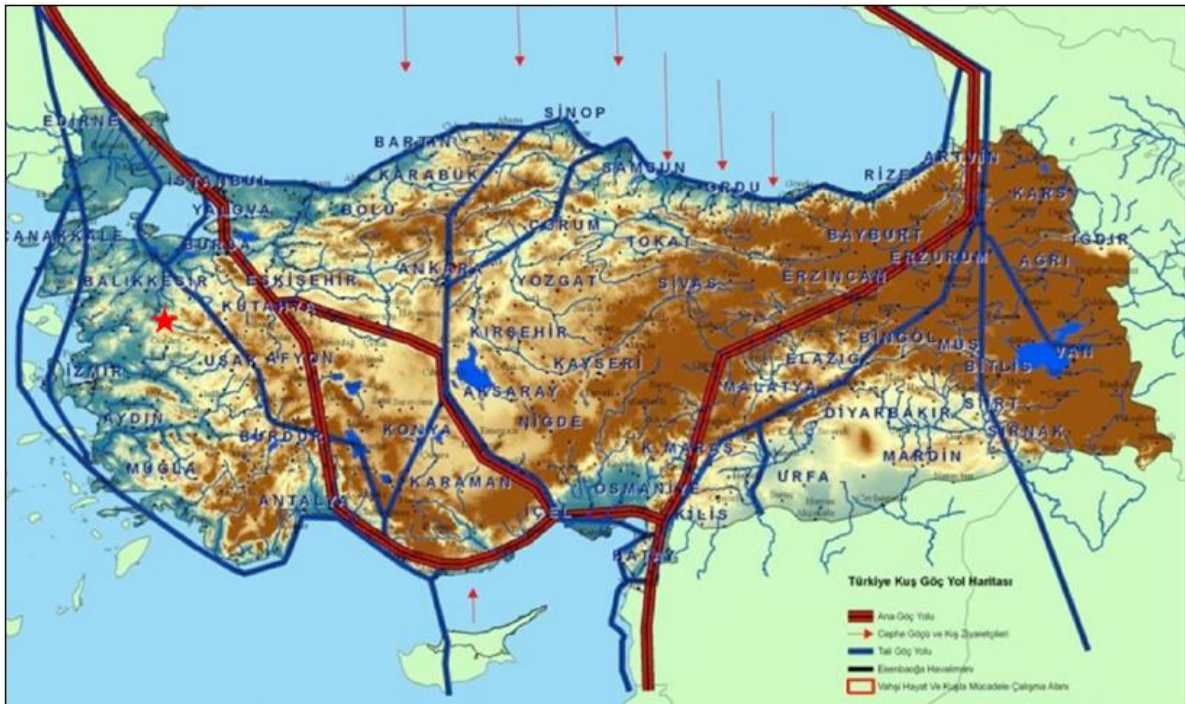


Figure 2.1: The Bird Migration Routes of Turkey and the Project Location (ESIA, 2015)

In accordance with the Environmental Social Assessment Report (ESIA) Report, there are no protected areas within the project site and its close vicinity. The closest protected area is Spil Mountain National Park which is located approximately 80 km to the project site.

According to the flora-fauna assessment study given in the Ecosystem Assessment Report (EAR) dated September 2014; 157 flora species under 38 families were identified in the project area. With respect to fauna study in the same report; 5 amphibian, 21 reptile and 22 mammal species were identified in the project site. Based on the EAR, among these species, no endemic flora and fauna species were determined in the project site.

The EAR also includes the detailed ornithology study. As a result of the relevant study, 55 bird species were identified in the project area. All species are categorized as LC (Least Concern) according to the IUCN Red List. In addition, 37 and 18 species are included in the Appendix II and Appendix III of the Bern Convention. According to the EAR, among these species only a few of them might be impacted due to the operation of turbines and the project site is not an attractive area for these bird species. Besides, no international and national important bird area is registered in the project site and its close vicinity. The closest important bird areas; *Sevişler Dam Lake* and *Sarıbeyler Dam Lake* are located approximately 4.5 km and 12.7 km to the project site respectively.

Based on the General Directorate of Nature Conservation and National Parks request stated in the official letter dated 19th February 2015, the Sponsor performed two monitoring studies between 21st April & 1st June 2015 and 14th August & 12th October 2015, respectively. The monitoring studies confirmed that the project site is not located on the main migration routes and at any feeding or breeding areas of endangered species. It is also stated that no significant impact is expected provided that all mitigation measures stated in these studies are performed and all legal requirements are complied with.

Table 2-1: Environmental Characteristics

ENVIRONMENTAL ASPECTS	PRESENCE/DISTRIBUTION	COMMENTS
Land use	The project site is registered as forestry area.	A pre-forestry permit has been secured for the total area of 231,128 m ² for two years. Final Forestry Permit needs to be obtained prior to the construction phase.
Water surface	N.A.	-
Protected area	The closest protected area is Spil Mountain National Park which is located approximately 80 km to the project site.	There are no protected areas within the project site and its close vicinity.
Flora and Fauna	<p>According to the Ecosystem Assessment Report (EAR); 157 flora species under 38 families and 5 amphibian, 21 reptile and 22 mammal fauna species were identified in the project site.</p> <p>Based on the ornithology study included in the EAR, 55 bird species were identified in the project area.</p>	<p>No endemic flora and fauna species were determined in the project site.</p> <p>Among the flora species, none of them were protected flora species in accordance with the IUCN Red List, Bern Convention and Convention on the International Trade in Endangered Species of Wild Flora and Fauna (CITES).</p> <p>Among the fauna species, <i>Testudo graeca</i> (Common Tortoise) is classified as VU (Vulnerable) category according to the IUCN Red List.</p>

		<p>Additionally, among the identified mammal species; <i>Rhinolophus Euryale</i> (Mediterranean Horseshoe Bat) and <i>Miniopterus schreibersii</i> (Schreiber's Bent-winged Bat) are classified as NT (Near-Threatened) category, whereas <i>Myotis capaccinii</i> (Long-fingered Bat) and <i>Rhinolophus mehelyi</i> (Mehely's Horseshoe Bat) are classified as VU (Vulnerable) category according to the IUCN Red List.</p> <p>No significant impact on identified flora and fauna species is expected.</p> <p>All bird species are categorized as LC (Least Concern) according to the IUCN Red List. In addition, 37 and 18 species are included in the Appendix II and Appendix III of the Bern Convention.</p> <p>The Sponsor is required to perform bird monitoring campaign for the first 2-years of operation.</p>
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2.2 Social condition of the project area

According to the latest census, the total population of the Manisa Province and Soma District are approximately 1,006,272 and 50,746 people, respectively (TÜİK, 2015).

There is no privately-owned area, or any settlement currently exists on the project area. The closest residential areas to the extension turbines are Beyce, Kızılören, Gökteş and Fırdanlar Villages. The distance between the project turbines and the closest sensitive receptors range from 500 m to 1300 m.

At the project site and in close vicinity, there is no historically, culturally and archeologically important place.

3. Environmental and Social Impact

A Project Information Report (PIR) highlighting the main expected environmental impacts was prepared for the extension project and considered as acceptable by Manisa PDoEU. In addition to the PIR, the Environmental & Social Impact Assessment (ESIA) Report was prepared for the extension project. The ESIA Report includes an “Environmental & Social Management Plan (ESMP)” and it is a comprehensive document including key environmental and social impacts of the extension project including access roads and supported by the various subject matter studies such as Ecosystem Assessment Report (EAR), spring and autumn seasons Monitoring Studies for birds & bats, “Landscape Restoration Plan Report”, public grievance system, etc.

The PC requires the revision of the existing H&S documentation (H&S Plan, Risk Assessment, Emergency Response Plan, etc.) and re-organizing the trainings concerning the new turbines and their locations to prevent any construction and operation related risks for both workers & local community. Besides, the Sponsor must also take necessary measures on the site (fencing, warning signs, CCTV, security staff, etc.) during the construction and operation phases of the extension project.

3.1 Land Use

The project site is registered as forestry area. A pre-forestry permit has been secured for the total area of 231,128 m² for two years. Final Forestry Permit needs to be obtained prior to the construction phase. There is no privately-owned area, or any settlement currently exists on the project area. Therefore, no physical and economic resettlement is expected in the scope of the project.

3.2 Water Use and Discharge

Based on the assumption that the daily domestic water requirement is 200 litres per capita and considering 10 employees during the construction phase and 41 employees (including existing plant and extension project) to be employed during the operation phase, the domestic water requirements are estimated as 2.0 m³/day and 8.2 m³/day, respectively. The collected wastewater will be disposed by the Manisa Metropolitan Municipality in line with local environmental regulation.

3.3 Waste Production and Management

The solid waste which will be generated during the construction works is excavation waste (from preparation of tower foundations, excavation for cabling, access roads) and domestic solid waste (paper, plastics, glass etc.). Assuming a daily domestic solid waste production is 1.14 kg per capita, it is estimated that 11.4 kg/day of domestic waste will be produced by 10 project workers to be employed during construction phase and 46.7 kg/day of domestic waste will be produced by 41 project workers to be employed during operation phase. In the existing plant, domestic solid wastes are collected in the closed bags and transferred to the waste container of Soma Municipality weekly. In addition, recyclable wastes will be separately collected and sent to the authorized firms.

Topsoil will be temporarily stored at the construction site and then re-used. Excavated soil will be re-used for the filling of the turbine foundation, access roads and site levelling purposes.

Maintenance of the construction machinery and equipment will be carried out at the closest service providers. Thus, no hazardous waste generation is expected at the construction site. In addition, maintenance of the turbines will be performed by the turbine provider and wastes will be handled by this provider.

In the existing plant, waste vegetable oils are separately collected in line with the related regulation and collected by KOLZA Biodizel Yakıt ve Petrol Ürünleri Sanayi ve Tic. periodically.

Minor amounts of medical waste are expected to be generated. These wastes will be handled in line with the Regulation on Control of Medical Wastes.

It must be noted that The ESIA Report provides detailed information about pollution prevention and abatement in terms of waste management. All proposed mitigation measures in the ESIA Report must be implemented by the Sponsor.

3.4 Birds and other species

Based on the EAR Report, no endemic flora and fauna species were determined in the project site. In accordance with the ESIA Report, there are no protected areas within the project site and its close vicinity.

According to the EAR; 157 flora species under 38 families also 5 amphibian, 21 reptile and 22 mammal fauna species were identified in the project site. Among the flora species, none of them were protected flora species in accordance with the IUCN Red List, Bern Convention and Convention on the International Trade in Endangered Species of Wild Flora and Fauna (CITES). Among the fauna species, *Testudo graeca* (Common Tortoise) is classified as VU (Vulnerable) category according to the IUCN Red List. Additionally, among the identified mammal species; *Rhinolophus Euryale* (Mediterranean Horseshoe Bat) and *Miniopterus schreibersii* (Schreiber's Bent-winged Bat) are classified as NT (Near-Threatened) category, whereas *Myotis capaccinii* (Long-fingered Bat) and *Rhinolophus mehelyi* (Mehely's Horseshoe Bat) are classified as VU (Vulnerable) category according to the IUCN Red List. No significant impact on identified flora and fauna species is expected.

With respect to the ornithology study included in the EAR, 55 bird species were identified in the project area. All bird species are categorized as LC (Least Concern) according to the IUCN Red List. In addition, 37 and 18 species are included in the Appendix II and Appendix III of the Bern Convention. The project area is not located within a significant transition route of the birds or not close to the main transition routes of the birds.

The mitigation measures stated in the ESIA must be followed and implemented during all project phases. The PC requires bird monitoring campaign for the first 2-years of operation.

3.5 Emissions: Noise and Particulate

Noise will be generated due to operation of equipment/machinery and turbines during the construction and operation phase. The noise level calculations were performed within the scope of the ESIA Report. According to the calculation results, noise levels during the construction and operation phases at the closest sensitive receptor in Beyce Village will be 52.25 dBA and 49.7 dBA, respectively which are in-compliance with the national limit. It is required that the Sponsor must carry out a noise measurement at least before the operation and repeat in case any complaint.

Dust will be generated due to earth-moving and material storage, whereas exhaust emissions will be generated due to operation of construction machinery and equipment during the construction phase. No impact is expected during the operation phase. In the ESIA Report, hourly dust emission rates were calculated for the stripping of vegetative soil and excavation works, separately. It is shown that dust emission rates for the controlled case (i.e. the case when the mitigation measures are implemented) are 0.24 kg/hour and 0.394 kg/hour, respectively which are in-compliance with the national limit. In the ESIA, exhaust emissions were also calculated. Considering the overall calculated values, impact on air quality can be accepted as negligible provided that all proposed mitigation measures in the ESIA Report are implemented. No adverse impact on air quality is expected due to the construction and operation of the project, nevertheless the PC requires dust monitoring during construction activities.

3.6 Landscape

Landscape is usually a sensitive aspect for these kinds of projects. The ESIA already provides a visual impact assessment. However, this issue could be assessed in detail in regard of the visual impacts from sensitive locations. It is required to prepare a VIA study covering the photo-impact simulations from significant and sensitive viewpoints. Besides, monitoring for landscape rehabilitation must be conducted based on the "Landscape Rehabilitation Plan Report" included in the ESIA for the post-construction phase of the project.

A summary of the impacts with their quantifications is given in the Table 3-1:

Table 3-1: Impact Quantification

COMPONENT	IMPACT	QUANTIFICATION
Land use	<u>Use of The Forestry Land</u>	A pre-forestry permit has been secured for the total area of 231,128 m ² for two years. Final Forestry Permit needs to be obtained prior to the construction phase.
Water	<u>Utilization and Discharge</u>	2.0 m ³ /day during the construction phase 8.2 m ³ /day during the operation phase (assuming 41 workers during construction and 10 workers during operation)
Waste	<u>Production of Solid Waste</u>	11.4 kg/day in the construction phase and 46.7 kg/day in the operation phase
	<u>Excavation Waste</u>	Excavated soil will be re-used for the filling of the turbine foundation, access roads and site levelling purposes.
Birds and other fauna and flora species	<u>Interference with Migration Routes/Interference with Protected Species</u>	No endemic flora and fauna species were determined in the project site. The project site is not located on the main migration route. The PC requires bird monitoring campaign for the first 2-years of operation. The new monitoring reports must be prepared taking into account existing and new turbine locations.
Emissions	<u>Noise</u>	52.25 dBA in construction and 49.7 dBA in operational phase < local reg. limit of 70 dBA
	<u>Particulate</u>	0.24 kg/hour due to stripping of vegetative soil and 0.394 kg/hour due to excavation works < local reg. limit = 1 kg/h Dust monitoring is suggested during construction activities.
Landscape	<u>Visual Impacts</u>	It is required to prepare a VIA study including the photo-impact simulations from significant and sensitive viewpoints. Monitoring for landscape rehabilitation based on the "Landscape Rehabilitation Plan Report" included in the ESIA Report must be conducted.
Access road construction and other WPPs around	<u>Cumulative E&S impacts</u>	The cumulative impacts from access road construction and other WPPs around must be evaluated in a CIA study with particular reference to bird life, landscape and visual impacts on sensitive locations.

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