



**REPORT**

**Mirny (Kazakhstan) 1GW Wind Farm Project**  
*ESIA Report Chapter 01 - Introduction*

Submitted to:

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## List of Frequently Used Abbreviations

ACBK	Association of Kazakhstan for the Conservation of Biodiversity
ADB	Asian Development Bank
AF	Associated Facility
AIIB	Asian Infrastructure Investment Bank
AoA	Analysis of Alternatives
AoI	Area of Influence
ACBK	Association for the Conservation of Biodiversity of Kazakhstan
BESS	Battery Energy Storage System
BMP	Biodiversity Management Plan
BMS	Battery Management System
CCDR	Country Climate and Development Report
CCRA	Climate Change Risk Assessment
CH	Cultural Heritage
CHA	Critical Habitats Assessment
CHS	Community Health & Safety
CIA	Cumulative Impact Assessment
CLO	Community Liaison Officer
CO	Carbon Oxide
CO <sub>2</sub>	Carbon Dioxide
D	Duration
dB	Decibel
dBA	Decibel Ampere
E&S	Environmental and Social
EBRD	European Bank for Reconstruction and Development
EHS	Environment, Health & Safety
EIB	European Investment Bank
EoL	End of Life
EP	Equator Principles
EPC	Engineering, Procurement, and Construction
EPFI	Equator Principles Financing Institutions
EPRP	Emergency Preparedness and Response Plan
ERP	Emergency Response Plan
ESAP	Environmental and Social Action Plan
ESBS	Environmental and Social Baseline Study
ESDD	Environmental and Social Due Diligence
ESIA	Environmental & Social Impact Assessment

ESMP	Environmental and Social Management Plan
ESMS	Environmental and Social Management System
F	Frequency
FSI	Fragile State Index
FSWP	Field Survey Execution Work Plan
GBVH	Gender Based Violence and Harassment
G	Geographic Extent
GFDRR	Global Facility for Disaster Reduction and Recovery
GHG	Greenhouse Gas
GIIP	Good International Industry Practices
GN	Guidance Note
GO	Green Operating LLP
GSI	Global Slavery Initiative
GW	Giga Watt
GWP	Global Warming Potential
HDI	Human Development Initiative
H&S	Health and Safety
HR	Human Resources
HRRA	Human Rights Risk Assessment
HV	High voltage company
HVAC	Heating, Ventilation and Air Conditioning
I	Intensity
IA	Impact Assessment
IAF	IAF-Radioökologie GmbH Independent Environmental and Social Consultant
IBA	Important Bird and Biodiversity Area
IBLF	International Business Leaders Forum
ICCPR	International Covenants on Civil and Political Rights
ICESCR	International Covenant on Economic, Social and Cultural Rights
ICH	Intangible Cultural Heritage
IE	Individual Entrepreneurs
IESC	Independent Environmental and Social Consultant
IFC	International Finance Corporation
IFI	International Financial Institution
ILO	International Labour Organization
IoA	Institute of Acoustics
ISO	International Organization for Standardization
IUCN	International Union for the Conservation of Nature
IV	Impact Value

KEGOC	Kazakhstan Electricity Grid Operating Company
kV	Kilovolt
LARP	Land Acquisition and Resettlement Plan
LRP	Livelihood Restoration Plan
m	Meters
m/s	Meters/Second
MP	Management Plan
MSDS	Material Safety Data Sheet
MV	Medium voltage
MW	Mega Watt
MWh	Mega Watt hour
NDC	Nationally Determined Contribution
NGO	Non-Governmental Organization
NO	Nitrogen Oxides
NO <sub>2</sub>	Nitrogen Dioxides
NTS	Non-Technical Summary
OECD	Organisation for Economic Co-operation and Development
OHTL	Over Head Transmission Line
OHS	Occupational Health and Safety
O&M	Operation and Management
PAH	Carbon, Polycyclic Aromatic Hydrocarbon
PAP	Project Affected People
PMC	Project Management Contractor
PPA	Power Purchase Agreement
PPE	Personal Protective Equipment
PR	(EBRD) Performance Requirements
PS	(IFC) Performance Standard
R	Reversibility
RCP	Representative Concentration Pathways
RIV	Residual Impact Value
S	Sensitivity
SEER	Seasonal Energy Efficiency Ratio
SEP	Stakeholder Engagement Plan
SS	Substation
SSP	Shared Socioeconomic Pathways
STI	Sexual Transmission Infections
UDHR	Universal Declaration of Human Rights
UN	United Nations

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UNDP	United Nations Development Programme
UNEP FI	United Nation Environment Programme Finance Initiative
UNFCCC	United Nations Framework Convention on Climate Change
UNGP	United Nations Guiding Principles
VEC	Valued Environmental and Social Components
VOC	Volatile Organic Compounds
WBG	World Bank Group
WGI	Worldwide Governance Indicators
WHO	World Health Organisation
WPP	Wind Power Plant
WTG	Wind Turbine Generator
ZVI	Zones of Visual Influence

## 1.0 INTRODUCTION

This document is the Environmental and Social Impact Assessment (“ESIA”) prepared for the construction and development of an onshore wind power plant (“WPP”) having 1 GW capacity to be located in Mirny, Kazakhstan (“the Project”). The ESIA report is presented by Aktas Energy LLP (“the Client” or “the Company”).

The Client appointed WSP Italia S.r.l. (“WSP”) as Environmental & Social (“E&S”) consultant to prepare the full set of E&S package. This has been organised in separate reports: the Environmental and Social Baseline Study (“ESBS”), whose first version was delivered in October 2024 and subsequently revised (ref. doc. **24685792-002-R-Rev.4\_ESBS**), which has informed the Impact Assessment (ESIA or this report) prepared for the Project construction and operation.

WSP team collected primary and secondary baseline physical, social and biological data which informed the impact assessment. The biodiversity studies started in April 2023 and given the prolongation of the ornithological surveys caused the discrepancy in the timeline of the submission of the biodiversity baseline.

As specified in the ESBS report, the Client approached the Lenders for seeking the financing of the Project. Société Générale is acting as financial advisor and, in its mandate, is coordinating the interest to the Project of various International Financial Institution (“IFI”) including the European Bank for Reconstruction and Development (“EBRD”), Proparco, and others. Because of the Lenders involved, there are several environmental and social obligations to carry out the ESIA process according to national and international standards. The Client appointed WSP to develop the Project ESIA in line with both the national and the international standards, laws and regulations.

The Lenders selected Ramboll as Independent Environmental and Social Consultant (“IESC”) which reviewed the ESIA study and provided independent opinion on the adequateness and robustness of the studies.

### 1.1 Context of the Project

In February 2023, the government of Kazakhstan approved the long-term Strategy for Achieving Carbon Neutrality of the Republic of Kazakhstan until 2060, which sets ambitious net-zero carbon goals for climate action and identifies key technological transformations needed for the country's decarbonization. According to the Strategy, the country has created the necessary conditions for the development of renewable energy sources. By 2030, Kazakhstan plans to increase the share of renewable energy sources in its balance from the current 4.5% to 15%, according to the country's prime minister. To contribute to this ambitious objective, the government of Kazakhstan is investing in the development of new renewable energies infrastructures across the country.

The new Mirny WPP falls in this strategy and the electricity to be produced by the Project will be entirely sold to the Financial Settlement Center of Renewable Energy, a public entity owned by the Government of Kazakhstan, for the supply of the national grid. The Project will provide electricity to 1 million people and aims at supporting the regional sustainable growth and contributing to the local employment.

### 1.2 Scope of the ESIA Process

The involvement of the Lenders requires that the Project is developed in accordance with a robust environmental and social impact management structure in line with good international and industrial practice. Consequently, as per the Lenders requirements, this ESIA is prepared according to the Client standards, to the protocols for the Wind Sector and to all applicable local, national, and international environmental and social (“E&S”) – including occupational health and safety – legislation and guidelines, including key E&S permits and approvals required under national legislation and conventions and treaties adopted by Kazakhstan.



Specifically, as detailed in the Legal Requirements chapter (Chapter 03) of the ESBS report (ref. doc. **24685792-002-R-Rev 4\_ESBS**), this ESIA study is prepared in accordance with:

- International Finance Cooperation (“IFC”) Performance Standards (2012);
- World Bank Group (“WBG”) General Environmental, Health and Safety (“EHS”) Guidelines (2007), Wind farm EHS Guideline and Electric Power
- Transmission & Distribution EHS Guidelines (2007);
- Equator Principles EP4 (“EP”) (2020);
- EBRD E&S Policy and relevant Performance Requirements;
- European Investment Bank (“EIB”) E&S Standards;
- ADB Safeguard Policies;
- AIIB E&S Policy;
- International Union for the Conservation of Nature (“IUCN”) guidance on wind projects;
- Other relevant standards and guidelines relevant to the assignment (The Convention on Wetlands, BirdLife International, Eurobats recommendations and best practice guidelines, Good Practice Handbook on the Design of Post-Construction Monitoring of Bird and Bat Fatalities Wind Energy Facilities, Scottish Natural Heritage Guidance Note, etc.);
- International Labor Organization (“ILO”) conventions signed and ratified by the countries; and
- United Nations (“UN”) Guiding Principles on Business and Human Rights.

In light of this, the Client engaged WSP, a leading global specialized engineering and consulting organization with over 60 years of successful service to its clients, to develop an ESIA package to identify potential environmental and social risks and impacts associated with the construction and operation phases of the Project and prepare management documentation of E&S risks and impacts as part of the package, with the ultimate goal of achieving compliance with applicable Lenders' E&S standards.

For completing the assignment, WSP benefited from a collaboration with:

- a local team of experts of the Kazakh company Green Operating LLP (“GO”), based in Astana, which conducted the field activities and the E&S surveys, the baseline data collection, the stakeholder engagement meetings and the public consultation, supported by specialists from a local accredited laboratory to carry out the environmental sampling and analyses;
- a team of experts of the German company IAF-Radioökologie GmbH (“IAF”) conducted the Radiation Survey together with technical specialists from the accredited radiological laboratory WISUTEC.

Both GO and IAF operated under the technical direction and supervision of WSP and provided support in the completion of the environmental and social impact assessment, named OVOS in the Kazakh legislation, in order to obtain the necessary environmental permits for the construction and development of the Mirny WPP.

Regarding Biodiversity, the Company appointed separately the Association for the Conservation of Biodiversity of Kazakhstan (“ACBK”) which was guided and supervised by WSP during the overall survey monitoring period.

The ESIA is submitted in February 2025 based on design data available from the Company at the beginning of January 2025. Changes in the design that occurred afterward have not been considered.

## 1.3 Assumptions in the ESIA study

For the benefit of the ESIA process and considering the magnitude of the study there are some assumptions that were adopted in drafting the documents, as follows:

- **Reference Standards:** Although the study was carried out in compliance with national legislation and a number of international standards, the main reference considered is the E&S General Specification of Total Energies, which adopts the IFC PSs as its main reference standard; therefore, the study refers to Area of Influence, Associated Facilities, etc. (see further below). Considering the specificity of the Biodiversity component and other differences existing among the applicable lenders' standards, discussions and analysis that consider the specific requirements of IFC, EBRD and EIB and their differences and nuances are from time to time presented in the study.
- **Use of the terminology "Project Area of Influence", "Project Site" and "Project Footprint":** the study adopts the following terminology and meanings:
  - The "Project Footprint" is the exact area occupied by Project facilities, such as structures, buildings, turbine pads, electric line pilons and the like.
  - The "Project site" includes the Project Footprint but it is larger than that as it also includes the area that is not occupied by any facilities but falls within the boundary of the site legally allocated to the Project (see Chapter 2, "Project Description" for more details).
  - The "Project Area of influence" is the area corresponding to the definition included in Par. 8 of IFC PS1 (i.e. the area which (i) is affected by the Project and the Client's activities, (ii) encompasses all Project's associated facilities and (iii) cumulative impacts). The "Project Area of Influence" is also considered to correspond to the spatial range where Project facilities, Project activities and associated facilities generate environmental and social risks, and cumulative impacts as well, as per Par.9 and 10 of EBRD PR1.
  - Terms such as WPP Footprint, Site, or Area of Influence ("Aoi"), as well as OHTL Footprint, Site or Area of Influence are used according to the same definitions provided above, however they refer to, respectively, the WPP or the OHTL only. As such, the OHTL and the WPP Areas of Influence, when taken individually are subsets of the Project Area of Influence, while they together correspond to the Project Area of Influence; the same concept applies to the WPP and OHTL sites and footprints.

## 1.4 ESIA phases

### 1.4.1 Review of existing documents/information

The first phase of the ESIA process included the review of the existing Project documentation made available by the Client:

- Analysis of sites, access roads and corridor for the transmission line;
- Technical studies, maps, charts and drawings;
- Site visits reports carried out by the Client's different technical teams;
- Draft Construction plans and gaant; and
- The Company procurement policies and EHS procedures.

In addition to these, scientific studies and reports available online and information retrieved from major international research websites were also used, since no local ESIA was available.

### 1.4.2 Site visit

WSP team visited the Project site during the scoping phase in October 2023.

Additionally, WSP team of experts of GO and IAF conducted the field surveys at the Project site the week of July 8<sup>th</sup>, 2024. The activities were aimed at confirming the AoI and obtaining a better understanding of the Project site relevant and most updated characteristics and site setting in terms of E&S issues. The site-specific surveys mainly consisted of socioeconomic surveys (including stakeholder engagement) and environmental surveys (groundwater sampling and analysis, noise measurements and radiological tests).

WSP biodiversity team conducted additional visits in August 2024 to organise the survey for the transmission line corridors.

The Stakeholder engagement and consultation activities are summarized in the final Stakeholder Engagement Plan ("SEP") report (ref. doc. **24685792-003-R-Rev 0**), delivered together with this ESIA report. The SEP was drafted according to the EP5 and the IFC's PS1 and details information on stakeholder engagement activities performed and planned by the Client to engage with stakeholders and communities along the process.

### 1.4.3 Impact Assessment and identification of mitigation measures

As requested by the international standards, an impact assessment has been carried out. The general methodology adopted by WSP for ESIA studies is described in Chapter 03 and has been designed to be highly transparent and to allow an analysis of the impacts on the various E&S components.

Chapters 04, 05 and 06 include the identification, assessment, and quantification of the potential E&S impacts (both positive and negative, direct, and indirect) respectively for Physical, Social and Biodiversity components associated with the Project, as well as risk of accidents, if any identified. Cumulative impacts and effects of unplanned events are described in Chapter 10 and Chapter 11.

Once impacts have been assessed, each section of the impact assessment presents a summary of residual impacts with a significance rating, and relevant mitigation measures to avoid, or where avoidance is not possible, minimize, mitigate or compensate adverse impacts (as per the mitigation hierarchy). The mitigation measures presented in the ESIA report will be the basis for the preparation of the Environmental and Social Management Plans ("ESMPs") for the Project.

### 1.4.4 Human Rights Risk Assessment and Stakeholder Engagement

In compliance with the requirements of the EP4, this ESIA report includes the results of a Human Rights baseline surveys and the Human Rights Risk Assessment ("HRRR").

Chapter 07 provides a detailed HRRR at country level and then focuses on the specific risks at Project level, indicating whether these risks are considered likely to decrease or exacerbate at the Project level. For risks that have been considered medium to high at Project level, mitigations are proposed for inclusion in the ESMPs, elements of the Environmental and Social Management System ("ESMS"); such mitigations are considered sufficient to reduce the risk to an acceptable level.

Moreover, as required by international standards, the ESIA includes a Stakeholder Engagement chapter, Chapter 08, that supports the process carried out for identifying and engaging with all groups potentially impacted.

### 1.4.5 GHG Calculation and Climate Change Risk Assessment

In accordance with the Lenders requirements, this ESIA report includes a Climate Change Risk Assessment ("CCRA") for Physical Risk under Chapter 09.

The CCRA provides a screening of climate hazards that may affect the Project Aol and, for each hazard, it determines a risk level in consideration of the Project's sensitivity and exposure, and of its ability to adapt to increasing climate hazards over a temporal scope of up to 80 years. Mitigations are finally proposed for consideration in the detailed design for the Project and in the ESMPs.

#### **1.4.6 Establishment and implementation of an ESMS**

Mitigation, compensation, and monitoring measures will become part of the Project set of construction and operation ESMPs, components of the overall Project ESMS to be established to ensure that the Project E&S impacts and risks are duly managed over the life of the Project. The ESMS Framework document under Chapter 12 will provide more details on the ESMS and its structure.

### **1.5 Outline of the ESIA report**

This ESIA report is organized in the following sections:

- ESIA Introduction (Chapter 01);
- Analysis of Alternatives (Chapter 02)
- Impact Assessment Methodology (Chapter 03);
- Impact Assessment - Physical Components (Chapter 04);
- Impact Assessment - Social Components (Chapter 05);
- Impact Assessment - Biological Components (Chapter 06);
- Human Rights Risk Assessment (Chapter 07);
- Stakeholder Engagement (Chapter 08);
- Climate Change Risk Assessment (Chapter 09);
- Cumulative Impacts Assessment (Chapter 10);
- Unplanned Events (Chapter 11);
- Environmental and Social Management System (Chapter 12).

The following Annexes are part of the ESIA studies:

- ESIA APPENDIX A - Noise and Flickering Model.
- ESIA APPENDIX B - Project Land Needs and Potential Displacement Impacts.

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