AZERENERJI JOINT-STOCK COMPANY

Azerbaijan Scaling-Up Renewable Energy Project
(AZURE Project)
P505208

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT NON-TECHNICAL SUMMARY (NTS)

February 2025

1 Introduction

1.1 Purpose and Scope of the ESIA

The Azerbaijan Scaling-Up Renewable Energy Project (AZURE) is a significant initiative aimed at expanding Azerbaijan's capacity for renewable energy, specifically solar and wind power. The project involves the design, construction, and operation of new energy infrastructure and systems to transmit electricity from renewable sources to the national grid. As part of this process, an Environmental and Social Impact Assessment (ESIA) has been carried out to evaluate potential environmental and social (E&S) risks, both positive and negative, that may arise during the project's lifecycle.

The overall objective of the ESIA is to provide a comprehensive understanding of how the project will impact the environment and affected communities and their people, ensuring that risks are identified early and mitigation measures are incorporated into design, construction and operations. This assessment includes environmental, social, and health considerations for communities within the Area of Impact (AoI). The ESIA serves as a decision-making tool for stakeholders, including AzerEnerji, local communities, government agencies, and relevant international financial institutions such as the World Bank.

The specific objectives of the ESIA are to achieve the following tasks:

- Undertake a comprehensive study of the pre-Project environmental and socioeconomic baseline of the project sites and the project AoI;
- Study of all feasible alternatives of the Project and its' individual components (including "Zero Project" alternative)
- Regardless of the probability, magnitude and receptor sensitivity of each particular impact, identification and comprehensive assessment of all direct/indirect, as well as negative/positive impacts expected from various sources throughout the construction and operation phases of the Project
- Development of appropriate, effective and feasible impact management measures according to the sequential impact management hierarchy (prevention / mitigation / rehabilitation / compensation)
- Preparation of environmental and social management / monitoring plans for the Project, based on the identified impact management activities

The scope of the ESIA includes a detailed examination of E&S risks and impacts, public consultations, and a management plan to address identified E&S risks and impacts. It aligns with both national laws and World Bank Environmental and Social Framework (ESF) and associated Environmental and Social Standards (ESSs) to promote sustainable development. This process ensures that the project's benefits, such as energy security, job creation, and reduced greenhouse gas emissions are maximized while minimizing potentially adverse effects on the environment and local communities.

The AZURE project will have a widespread geographical impact across the country. AoI comprises a generally narrow strip extending across 7 administrative districts of Azerbaijan, namely Hajigabul, Aghsu, Shamakhi, Ismayilli, Goychay, Aghdash and Yevlakh districts, covering 30 communities and Mingachevir town.

The ESIA (to date Oct 2024) has relied on desktop, existing data for much of the environmental and social baseline, apart from some field studies on soil, water quality, social receptor, and some limited traffic counts. It is the intention to conduct additional fieldwork, especially for community health and safety, understanding impacts as a result of land acquisition and easement, and biodiversity aspects including migratory and sensitive populations of birds and the issue of bird and bat strike for Overhead Lines (OHLs), and potential presence of critical habitats.

1.2 ESIA Programme and Team

The ESIA study programme was developed based on the study components described in the section below and covered the period of 6 weeks from July 15th to August 25th, 2024. This was followed by some additional fieldwork and engagement and the study extent was up to 1st October.

The ESIA team comprised employees of the “IQLİM Ltd.” Company, with experience in a range of ESIA study elements, including engineers, biodiversity, soils, air and water quality.

2 Project Description

The AZURE Project is designed to scale up Azerbaijan's renewable energy capacity through new infrastructure projects, primarily focusing on transmission lines and substations. The project involves the construction of new OHLs and substations, to ensure that electricity generated from solar and wind farms is efficiently transmitted to Azerbaijan's national grid. The project spans across several key regions, including Mingachevir, Hajigabul, and Absheron, with plans for further expansion in Banka and Bilasuvar.

The establishment and successful development of the AZURE Project will be an important part of the general policy of GoA, allowing Azerbaijan to become an important exporter of green energy to the international markets, with diversified and export-oriented economy creating high-added value, based on a world class attractive business environment, with modern energy, transportation, and logistical infrastructure. The Project will strengthen Azerenerji’s transmission network, making it more reliable and capable of handling increased power flow and the fluctuating generation from the solar power plants (SPPs). It will enable Azerenerji with integrated variable renewable energy (VRE) system planning, improve system flexibility, and increase staff capacity to operate and dispatch variable renewable energy.

The Project aims to deliver significant socioeconomic and environmental benefits by creating jobs, reducing reliance on fossil fuels, and improving energy security. The long-term goal of the AZURE Project is to support Azerbaijan's transition towards a sustainable energy future, in line with its commitment to renewable energy development and climate change mitigation.

The following sections outline the GoA and WB financed components.

The AZURE Project’s scope

Component 1: Absheron Wind Power Plant Connection and Transmission Network Strengthening (US$168.4 million IBRD). This component will support (i) the construction of a 330 kV transmission connection to evacuate power from the 240 MWac Absheron WPower Plant (WPP), and (ii) the 500 kV upgrade of Navahi Substation and related infrastructure for the reliable N-1 evacuation of 1 GW of variable renewable energy connected to the Navahi

substation and the enhanced fluctuation management of 1.8 GW of VRE capacity in the system to ensure grid stability.

1. This component comprises the following (See Figure 1 below):

(b) **Subcomponent 1.1: Connection of Absheron WPP – 330 kV Grid** (US$33.8 million), including: (i) 65 km OHL single circuit 330 kV from Absheron wind plant substation to Navahi substation, (ii) 19 km OHL single circuit 330 kV from Absheron wind plant substation to Gobu PP substation, (iii) 22 km OHL double circuit 330 kV from Navahi substation to Alat substation, and (iv) expansion of 330 kV bays at Gobu PP substation.

(b) **Subcomponent 1.2: 500 kV Strengthening** (US$ 134.6 million), including: (i) 235 km single circuit OHL 500 kV from Azerbaijan TPP substation to Navahi substation (ii) supply and installation of equipment for 500 kV part of Navahi (2x 500 MVA) substation (ii) expanding the 500 kV bays at Absheron and Azerbaijan TPP substations.

Component 2: Project implementation support (US$5.1 million IBRD). This component will finance consulting, capacity building and auditing services to support the PIU in project implementation. The consulting services will comprise a Supervision engineer to assist the PIU with the implementation of component 1 and relevant technical consultants to support the achievement of project objectives. In addition, the component will comprise the expenses of the project's external auditor and capacity building to create an enabling environment to enhance the skills and career prospects of women in the energy sector.

2.1 Associated Facilities

The 330 kV part of the Navahi substation financed by the Government of Azerbaijan and the Absheron Wind Power Plant financed by Masdar are associated facilities to the AZURE project; accordingly, they would be required to comply with the World Bank Environmental and Social Framework (ESF). **Environmental and Social Framework (ESF).** The disclosed draft Environmental and Social Impact Assessment (ESIA)/Environmental and Social Management Plan (ESMP), Stakeholder Engagement Plan (SEP), Resettlement Policy Framework (RPF), Labor Management Procedures (LMP) and Environmental and Social Commitment Plan (ESCP) were revised to reflect the new project scope description, impact assessment and mitigation measures. They will be redisclosed after approval of the revised ESIA by the World Bank.

The draft ESIA for the Absheron Wind Power Plant (WPP), including bird monitoring report, is expected to be disclosed by Masdar in April 2025. The draft ESIA will follow the environmental and social policies of Masdar's financiers: ADB, EBRD and AIIB. The Environmental and Social Due Diligence consultants recruited by Azerenerji will review the draft ESIA to identify if it is in conformity

with the WB ESF ESSs, and suggest any corrective actions as needed, to be implemented before the start of respective civil works.

2.1.1 Private Sector

The Project is a part of Azerbaijan's renewable energy portfolio, currently with 50 MW of wind and 30 MW of solar capacity, and is set to expand by 4 GW through a partnership with Masdar and AquaPower. Investment Agreements signed between the GoA and Masdar Company envisage the construction of a 315 MWac solar PV project in Banka and 445 MWac solar PV project in Bilasuvar between 2026-2027, followed by 240 MW Absheron wind power plant in Gobustan scheduled by 2028.

3 Regulatory Framework

3.1 Constitution and National Legislation on Energy and Environment

The Constitution of Azerbaijan is the supreme law of the country, and while it doesn't explicitly address energy, several articles have important implications for the management of energy resources. Key provisions relevant to energy include:

- Article 148.II: International agreements acceded to by Azerbaijan become part of the national legislative system.
- Article 151: In the event of a conflict between Azerbaijan's national laws and international agreements, the provisions of the international agreements prevail.
- Article 12: Establishes the forms of ownership, including state, private, and municipal, which are particularly relevant for energy resources, as the state manages significant energy reserves.
- Article 39: Stipulates that the state must protect the environment, which is crucial given the environmental impact of energy production and consumption.

Azerbaijan's national environmental legislation is geared toward compliance with international standards, especially those of the European Union (EU). The main framework for environmental law is the Law on Protection of the Environment (1999), which defines the state's responsibility in regulating environmental activities, including the protection of natural resources and environmental monitoring. It also lays out principles for State Environmental Expertise (SEE), which mandates the review of all Environmental Impact Assessments (EIAs) before any project can be implemented. These EIAs must comply with national and international environmental standards, ensuring projects do not proceed without a positive SEE resolution.

The 2018 Law on Environmental Impact Assessment (EIA Law) establishes clear legal, economic, and organizational bases for assessing the environmental and social impacts of economic activities, particularly those in the energy sector. The law enforces transparency, public consultations, and adherence to environmental safety standards, ensuring that projects minimize their ecological footprint.

3.2 Energy Sector Regulations and Renewable Energy Development

Azerbaijan has undertaken extensive legislative measures to regulate its energy sector, particularly with regard to renewable energy development. The 2021 Law on Renewable Energy provides the legal framework for utilizing renewable energy sources in electricity production. This law is part of the government's broader strategy to diversify the country's energy mix, which has traditionally been dominated by fossil fuels.

Key components of Azerbaijan's renewable energy strategy include:

- State Program on the Use of Alternative and Renewable Energy Sources (2004): This program aims to assess the potential of renewable energy, reduce CO_2 emissions, improve energy efficiency, and create jobs in the renewable energy sector. It also contributes to national energy security by reducing dependence on imported fuels.
- Incentives for Renewable Energy Development: Amendments made in 2014 to customs and tax laws exempt equipment and materials used in renewable energy projects from import duties and VAT, providing a significant boost to the renewable energy sector.

Permitting procedures for renewable energy projects remain complex, as they involve multiple governmental agencies. The 2016 Decree on Electricity Production and Power Limits specifies that permits are required for power plants with capacities over 150 kW (for alternative energy) and 500 kW (for hydropower and biogas). Despite ongoing reforms, the division of responsibilities among ministries and local administrations can make the approval process lengthy and difficult to navigate.

National Energy Regulations also cover the broader electricity sector, supporting both conventional and renewable energy production. Recent years have seen increased governmental efforts to modernize the electricity grid, integrate renewable energy sources, and create a more favourable environment for international investment in the energy sector.

3.3 International Environmental Standards and Agreements

Azerbaijan is a signatory to several international conventions and agreements that influence its energy and environmental policies. Many of these international standards are incorporated into national legislation, and they significantly shape the country's approach to environmental protection and energy development.

Some of the key international frameworks that Azerbaijan would aim to adhere to for co-financed projects include:

- World Bank ESF: This framework outlines the World Bank's ESS, which apply to all projects financed by the bank. These standards emphasize an integrated approach to managing environmental and social risks and impacts throughout the lifecycle of a project.
- International Finance Corporation (IFC) Performance Standards: The IFC standards, particularly those on environmental and social sustainability, apply to International Financed Institution (IFI) private sector projects in Azerbaijan. These

standards require projects to assess their environmental impact, minimize pollution, and engage with local communities through stakeholder consultations.

- Equator Principles: A set of risk management guidelines adopted by a set of financial institutions to assess and manage environmental and social risks in project financing. These principles apply to all large-scale projects, ensuring that they are developed in a socially responsible and environmentally sustainable manner.

The ESSs outlined by the World Bank include:

ESS1: Assessment and Management of Environmental and Social Risks and Impacts

ESS2: Labor and Working Conditions

ESS3: Resource Efficiency and Pollution Prevention and Management

ESS4: Community Health and Safety

ESS5: Land Acquisition, Restrictions on Land Use, and Involuntary Resettlement

ESS6: Biodiversity Conservation and Sustainable Management of Living Natural Resources

ESS7: Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities – not relevant here

ESS8: Cultural Heritage

ESS9: Financial Intermediaries – not relevant here

ESS10: Stakeholder Engagement and Information Disclosure

These international frameworks provide a robust structure for Azerbaijan's environmental governance, especially as they pertain to large infrastructure and energy projects.

3.4 Gap analysis: World Bank's ESSs and Azerbaijan's Legislation

While Azerbaijan's regulatory framework for environmental protection and energy management is comprehensive, there are gaps that need to be addressed, particularly in aligning national laws with international standards. For example, the World Bank's ESSs often go beyond what is required by Azerbaijani law. In these cases, projects financed by international organizations must adhere to the more stringent international standards.

Public participation in environmental decision-making is another area that requires improvement. While Azerbaijan's laws provide for public consultations, there are challenges in ensuring that these processes are transparent and inclusive. The Århus Convention, which Azerbaijan has ratified, calls for public participation in environmental decision-making. However, there are still concerns that public input does not always influence decision-making processes as strongly as it should.

The consultants for the AZURE Project have undertaken a gap analysis of Azerbaijan's environmental legislation in comparison to the World Bank's ESF and highlighted areas where more robust public consultation, transparency, and environmental protections are needed. A general observation is for Azerbaijan to develop clearer procedures for holding

public hearings and to strengthen the legal framework for public participation in environmental decision-making.

Moreover, permitting processes for energy projects, particularly those in renewable energy, remain complex and fragmented. There is a need for greater coordination among ministries and local governments to streamline these processes and encourage faster development of renewable energy projects.

The gap analysis between the WB requirements and GoA ESIA legislation requirements undertaken for the project presented the findings and the rules that will be followed for the project, including aspects such as:

- inclusion of Associated Facilities into the ESIA
- inclusion of Environmental and Social (E&S) screening
- meaningful social impact assessment
- commitments to monitoring and management of E&S aspects
- enhancements to stakeholder engagement including establishment of a grievance mechanism at the project level
- understating on community health and safety
- identification of all affected people including informal users, tenants of public and private lands and structures affected by the project and the project's potential risks and impacts on their wellbeing and livelihoods, as well as provision of necessary support to all affected persons that goes beyond compensation and includes livelihood restoration
- conducting timely disclosure and consultations on E&S documents and resettlement issues starting from early stages of the project throughout the project life cycle
- ensuring that specific attention is paid to people or communities defined as vulnerable or disproportionately impacted
- undertaking a Critical Habitat Assessment in accordance with ESS6.

3.5 Stakeholder Engagement and Public Participation

Azerbaijan's legislative framework guarantees citizen participation in public decision-making processes, particularly regarding environmental issues. The Constitution of Azerbaijan provides for the right of citizens to participate in civil and political life, access to information, and protection of the environment. This framework is reinforced by laws such as the 2015 Law on Citizens' Appeals and the 2005 Law on the Right to Obtain Information, which ensure transparency in government actions and public access to environmental information.

The 2018 Law on Environmental Impact Assessment requires public hearings and consultations as part of the EIA process. This ensures that affected communities and stakeholders are informed about the potential impacts of projects and are given an opportunity to voice their concerns. Local governments and municipalities are involved in these processes, ensuring that project planning and implementation take local needs and opinions into account.

The World Bank's ESS10 and IFC Performance Standards also place significant emphasis on stakeholder engagement. These standards require project developers to engage in suitably early and meaningful consultation with affected communities, ensuring that their concerns are integrated into project planning and decision-making. This process includes ongoing

engagement throughout the project's lifecycle, from initial planning stages to project completion.

Stakeholder engagement must be free from coercion and intimidation, and it must provide communities with access to relevant information in a culturally appropriate and accessible manner. Grievance mechanisms are a key component of stakeholder engagement, allowing communities to lodge complaints and seek redress for any negative impacts caused by projects.

4 ESIA Methodology

4.1 Introduction to ESIA Methodology

According to the World Bank's ESF, a power project could fall into several categories. The WB has categorised the project as Substantial risk, due to a number of factors, meaning they might have adverse impacts that are wide ranging, largely reversible and site-specific. The WB ESS1 mandates several elements in the ESIA methodology:

- Scoping: Defining boundaries and key issues.
- Baseline Data Collection: Gathering relevant data.
- Impact Identification and Assessment: Analyzing potential positive and negative project impacts.
- Mitigation and Management Measures: Developing solutions to reduce adverse impacts.
- Environmental and Social Management Plan (ESMP): Planning the implementation of mitigation measures.
- Stakeholder Engagement: Including the participation of affected communities.
- Disclosure and Review: Public availability of documents and approval by authorities.

4.2 Scoping and Limitations

The scoping process sets the framework for conducting the ESIA by reviewing regulatory requirements, collecting data on the project area, identifying impacts, and planning further studies. This is a collaborative process between project teams and stakeholders. However, limitations in this ESIA are noted, primarily due to reliance on desktop studies and limited fieldwork. Additional field studies are required to inform better understanding of social impacts in particular community health and safety impacts, impacts as a result of land acquisition and easement, and covering environmentally sensitive areas and issues such as bird strike. Stakeholder engagement would also need to be undertaken with interested and affected parties.

4.3 Project Description

A comprehensive project description is essential for accurate ESIA. The ESIA team discussed the design and project components with AzerEnerji to gather essential details and these were used during the assessment.

4.4 Project alternatives

In accordance with accepted international practice the project's alternatives were analyzed at three levels:

- Strategic Alternatives (Power System Level).
- Corridor and Node Alternatives (technical, environmental, and social aspects).
- Route Optimization Alternatives (at the ESIA level)

4.5 Baseline Studies

Baseline environmental and socioeconomic data were collected through fieldwork and secondary data sources. The Area of Influence (AoI) spans 11 districts in Azerbaijan, impacting diverse ecosystems, communities, and infrastructure. Geographic Information Systems (GIS) were used for spatial analysis and mapping of affected areas, assisting in determining impacts on environmental and social aspects like land use, natural habitats, and water courses.

4.5.1 Study Methodology and Data Collection

The ESIA employed various methods, including field studies, laboratory tests, and consultations with stakeholders, to assess the pre-project conditions. Data were collected on soil quality, hydrology, air quality, social receptors, biodiversity, ecosystem services, and waste management. Secondary data was sourced from government agencies and published reports, covering environmental, geological, and socioeconomic aspects.

4.5.2 Soil and Water Quality Studies

Soil quality was assessed by sampling in designated locations and analyzing for various chemical and physical parameters. Similarly, water samples were taken from rivers within the project AoI and analyzed for pH, sulphates, heavy metals, and other contaminants. Meteorological studies focused on the project's climate implications, and air quality was monitored for potential pollutants like particulate matter (PM10 and PM2.5), nitrogen oxides (NOx), and sulfur dioxide (SO2).

4.5.3 Biodiversity and Ecosystem Services

Biodiversity studies mainly relied on existing literature and past surveys due to time constraints. The project is set to potentially impact diverse ecosystems, including key biodiversity areas, endangered species' habitats, and bird migration routes. Seasonal onsite biodiversity studies are planned to address gaps, particularly for bird migration and species near protected areas, including wetlands that support bird populations. Ecosystem services were studied to understand how natural environments provide essential benefits to human populations. If potential impacts on critical habitats are identified during the forthcoming CHA study, the ESS6 Guidelines on CHA would be referenced and followed to ensure that biodiversity mitigation measures are appropriately incorporated and managed.

4.5.4 Socioeconomic Baseline

The social baseline was primarily informed by secondary data. In September and October, site visits and meetings with affected communities were held to strengthen the local baseline to get an understanding vulnerable groups and identify sensitive social receptors at the community level which involved interviews, focus group discussions, data gathering on

sensitive receptors and other forms of engagement with local communities and government authorities.

4.5.5 Impact Assessment

The impact assessment process identified potential environmental, social, and public health impacts during the project's construction, operation, and maintenance phases. The nature and types of potential impacts addressed in the ESIA were defined as:

- Indirect Impacts: Secondary effects stemming from direct impacts.
- Cumulative Impacts: Effects from multiple projects.
- Receptors: The environmental and social elements potentially affected by the project. Each impact was assessed based on its magnitude, likelihood, duration, and extent. The potential impacts were further classified as positive, negligible, minor, moderate, or major, with different implications for environmental and social receptors.

4.5.6 Mitigation and Monitoring Measures

For negative impacts, the ESIA outlined the Mitigation Hierarchy, prioritizing:

- Avoidance: Altering project design to avoid impacts.
- Reduction: Minimizing impacts at the source.
- Abatement: Implementing control measures at the receptor site.
- Repair/Remedy: Restoring damaged resources.
- Compensation: Offsetting unavoidable impacts by creating benefits elsewhere.

Monitoring programs will track the effectiveness of mitigation measures and ensure compliance with the Environmental and Social Management Plans (ESMP), which include comprehensive project activities, regulatory frameworks, and auditing mechanisms.

5 Project Alternatives

The ESIA considered several project alternatives to ensure that the chosen approach would minimize environmental and social risks while maximizing benefits. The "Zero Project" scenario was analyzed, where no development would take place, allowing current conditions to remain. While this scenario would avoid all negative environmental impacts, it would also prevent the positive impacts, such as job creation and the shift towards renewable energy; ultimately leading to deleterious conditions such as increased use of fossil fuels for energy generation.

Other alternatives considered included different locations for the substations and OHLs, with assessments focused on minimizing disruptions to local communities and sensitive environmental areas. For example, alternative routes for the OHLs were reviewed to avoid crossing sensitive ecosystems or populated areas. The reconstruction versus new construction debate was also a key aspect, weighing the pros and cons of upgrading existing infrastructure versus building entirely new systems.

Ultimately, the chosen alternative prioritizes the construction of new infrastructure in less sensitive areas, balancing the need for modern energy transmission with the preservation of environmental and social integrity. This approach is expected to maximize the project's benefits while minimizing its ecological footprint.

6 Environmental Baseline

6.1 Introduction and Purpose of the EBS

The Environmental Baseline Study (EBS) forms a crucial part of the Environmental and Social Impact Assessment (ESIA). It evaluates the pre-project environmental parameters within the Area of Influence (AoI) to predict how these might change during and after construction and operation. This helps mitigate potential environmental impacts early in project development.

6.2 Study Area

The study focuses on several overhead line (OHL) corridors, including the 235 km long Azerbaijan TPP – Navahi SS, 220 km long Mingachevir HPP – Navahi SS, and several smaller corridors. The corridors traverse a range of terrains from lowlands to mountainous regions and cross significant natural and man-made features such as rivers, nature reserves, and settlements.

6.3 Physical Geography

Geology: The study area is geologically diverse, including lowland areas such as the Kur-Araz depression and mountain zones like Ajinohur-Langabiz. It is part of an active tectonic region, which has resulted in complex geological structures such as anticlines, synclines, and fault lines. Notably, the Shirvan lowland and Eastern Gobustan areas show significant sedimentary formations.

Mud Volcanism: Gobustan, part of the study area, has the highest concentration of mud volcanoes in the world, some of which are active and located close to the project area. These volcanoes emit gases such as methane, which sometimes ignite.

Geomorphology: The area includes diverse landforms, such as hills, ridges, valleys, plateaus, and alluvial plains. The Shirvan lowland features extensive flat terrain, while the Eastern Gobustan is characterized by its rugged terrain and volcanic features.

6.4 Soils and Land Use

The soil types in the project area vary significantly based on altitude and underlying rock formations. The studies revealed three key zones: Ajinohur-Langabiz, Shirvan lowland, and Eastern Gobustan, each with specific soil types ranging from grey-brown soils in the lowlands to saline and meadow-grey soils in the lowlands. The study identified concerns about elevated levels of heavy metals (e.g., cobalt, chromium, arsenic) in some areas.

Land Use: The primary land use is agriculture, with crops like wheat, barley, and cotton grown in rain-fed and irrigated fields. Grazing is also a common land use in the Ajinohur-Langabiz and Eastern Gobustan areas. Protected lands, such as the Turyanchay State Nature Reserve, are also part of the study area.

6.5 Hydrology

The region is crossed by several major rivers, including the Kur River, a critical water source in the Caucasus region. Other significant rivers include Kurakchay, Turyanchay, Goychay, and Girdimanchay, which contribute to the hydrology of the area. These rivers are used for irrigation and are crucial for agricultural productivity in the region.

Water Quality: Field investigations and laboratory analyses found increased turbidity in the surface water samples, and some rivers showed elevated levels of total dissolved solids (TDS) and sulfates.

6.6 Ambient Air Quality

Desktop studies collected and collated air quality data from official sources and was supplemented by some fieldwork that measures air quality across several areas, as summarised below.

Shirvan Lowland: Agricultural activities contribute to air pollution through dust, ammonia emissions, and VOCs from pesticides and fertilizers. Industrial activities, like power plants and oil/gas operations, release harmful pollutants, and transport adds NOx and particulate matter. Dust storms and biomass burning are also significant sources.

Eastern Gobustan: The natural emissions come from mud volcanoes, while oil and gas production, transport, and industrial activities (mainly near Baku and Sumgait) are the primary man-made pollution sources. Agriculture plays a lesser role here but still contributes through livestock emissions.

Across the Project AoI: Traffic is the main air pollution source, especially near transmission lines. Seasonal air pollution also comes from heating and agricultural activities, though no major industrial facilities exist in this area.

Overall, the monitoring data show that air quality in the project area is within acceptable limits.

6.7 Waste Management

Rapid economic growth observed in the recent years have led to an increase in the volumes of goods and services consumed and, resultantly, the amount of waste generated by the people of Azerbaijan. The domestic waste collection, transportation and disposal system is organized well in Greater Baku and several other large cities of the country. Nevertheless, efficiency of the system is either partial or none in the rural areas. Waste reuse and recycling measures have been developed to only very limited extents.

The waste management system in the towns, settlements and villages of the Project AoI differ depending on type and status of the settlement. Thus, larger cities like Mingachevir and Yevlakh have functioning waste collection system and centralized landfills, whereas some waste collection and disposal system in the smaller settlements and villages is arranged in only a semi-organized way.

6.8 Biological Diversity and Ecosystem Services

The study addressed biodiversity, including ecosystems, important biodiversity sites, and protected areas. The AoI includes statutory protected nature reserves and biodiversity sites, with species in different habitats ranging from semi-deserts to mountainous regions. These areas offer important ecosystem services, including agriculture, forestry, and grazing.

The biodiversity baseline for the study area covers a range of ecosystems, key biodiversity areas, flora, fauna, and the impact of human activities. The study traversed several distinct regions, such as the Shirvan Lowland, foothills of Ajinohur-Langabiz, and Eastern Gobustan, as well as protected areas like Turyanchay State Nature Reserve.

6.8.1 Key Biodiversity Areas (KBA) and Protected Areas

Turyanchay State Nature Reserve: Established in 1958, this reserve encompasses 22,488 hectares across several districts, primarily protecting arid light forests. The fauna includes over 17 rare animal species listed in the Red Book of Azerbaijan, such as the common tortoise and several eagle species. Sections of the AoI including Turyanchay host important numbers of birds during spring and autumn migration; quite probably triggering the need for a Critical Habitat Assessment to be conducted along with the Bird Migration and bat Impact Study and incorporated int the ESIA, ESMP and BMP.

Mud Volcano Group State Nature Reserve: This reserve was established to protect mud volcanoes in the Gobustan region. These geological formations are home to unique biodiversity, and 43 mud volcanoes are under protection in the reserve. Six of these volcanoes lie within the project area.

6.8.2 Flora

The flora within the study area is divided into several categories based on the distinct regions and their ecological conditions:

Shirvan Lowland and Ajinohur-Langabiz Zone:

The area is dominated by semi-desert and dry steppe communities. Vegetation types vary across different micro-reliefs, with wormwood, black saxaul, and other drought-tolerant species being common. Riparian forests and grasslands provide key ecosystem services, supporting a variety of plant species. In wet depressions, meadow and grass vegetation are common, while semi-desert plants dominate the foothill zones.

Eastern Gobustan:

This area has relatively poor flora, characterized by semi-desert species, ephemeral plants, and halophytes (salt-tolerant plants) that thrive in floodplains and saline soils. The vegetation here is adapted to arid conditions with low organic matter in the soil. Notable species include Artemisia (sagebrush), Salsola (saltwort), and several endemic species listed in the Red Book of Azerbaijan, such as *Astragalus bakuensis* and *Ferula persica*.

6.8.3 Fauna

The fauna of the region is diverse, with a summary of bird species, reptiles, and mammals presented below.

Birds:

The project area supports a rich avian diversity, particularly as part of global migratory routes. Fifteen bird species found in the area are classified as threatened globally, including the lesser kestrel and European turtle dove. Birds like the golden eagle, bearded vulture, and flamingos are commonly seen in protected areas like Turyanchay. The Beshbarmag Mountain area is an important bottleneck for migratory birds, making it of critical importance and a valuable bird-watching site.

Mammals:

The project area is home to 38 mammal species, including the vulnerable goitered gazelle and Schreiber's bat, both of which are listed in the Red Book of Azerbaijan. Other mammals

include wolves, jackals, and red foxes, which traverse the area, as well as smaller mammals like house mice, hedgehogs, and weasels.

Reptiles and Amphibians:

The Eastern Gobustan area is known for its reptilian diversity, with 18 species of snakes and lizards recorded. The Mediterranean tortoise is the only species listed as vulnerable by the IUCN and the Red Book of Azerbaijan. Amphibians are less common but may include species like the Eurasian frog and the lake frog in suitable wetland habitats.

6.8.4 Ecosystem Services

The study area provides a range of ecosystem services critical to both human and natural communities:

- Provisioning services: These include grazing lands for livestock and water for agriculture, with irrigation supported by rivers like the Kur and Turyanchay.
- Regulating services: Ecosystems in the area regulate climate and water cycles, particularly through forested areas and wetlands that maintain soil stability and water filtration.
- Cultural services: The region is important for ecotourism, especially for bird-watching and exploring geological features like mud volcanoes.
- Supporting services: These services include nutrient cycling and habitat provision for various species, ensuring biodiversity conservation and ecosystem stability.

Conservation Concerns:

The biodiversity in the study area faces several threats:

- Habitat degradation: Agricultural expansion, overgrazing, and industrial activities have led to habitat fragmentation and degradation, particularly in the semi-desert and steppe regions.
- Illegal activities: Dumping, illegal construction, and unregulated use of land around protected areas pose significant risks to biodiversity.
- Migratory bird interference: The linear nature of the project could disrupt bird migration patterns, requiring careful monitoring and mitigation strategies during construction.

Overall, the biodiversity and ecosystem services within the project area represent a complex and valuable natural heritage. Continued conservation efforts are necessary to protect threatened species and maintain ecosystem balance.

6.9 Climate and Meteorology

The region’s climate is primarily semi-arid with hot, dry summers and mild winters. Average annual precipitation is low, leading to significant reliance on irrigation for agriculture. The area is also prone to climate-related hazards such as droughts and floods, which could impact project implementation.

6.10 Potential Hazards

Seismicity: Azerbaijan is located in a seismically active region. Historical earthquakes in the region have had magnitudes of up to 8.0. The project area falls within an 8-point seismic zone, indicating a high risk of earthquakes.

Exogenous Hazards: The area is prone to landslides, soil erosion, floods, and desertification, particularly in regions like Shirvan lowland and Eastern Gobustan. Wind erosion and soil salinization also pose significant risks, particularly in the lowland areas.

7 Socioeconomic Baseline

The socioeconomic baseline study, which predominantly used desktop data and limited site observations, explored the current living conditions, demographics, and infrastructure within the project's AoI. Azerbaijan's economy is transitioning, with growing emphasis on renewable energy, but traditional sectors such as agriculture and industry still dominate.

- Demography: The region comprises several towns and villages, with populations largely dependent on agriculture, trade, and small-scale industry. The population density is higher in urban areas like Mingachevir, while rural districts have more dispersed populations.
- Economy and Employment: The local economy is primarily driven by agriculture and small-scale manufacturing. Unemployment rates are moderate, with many workers commuting to larger towns for employment. The AZURE project is expected to create new job opportunities, particularly during the construction phase.
- Education and Healthcare: Access to education and healthcare services is generally good in larger towns but more limited in rural areas. The project will provide training for local workers, increasing the skills base in renewable energy technologies.
- Infrastructure: Roads, water supply, and electricity networks are relatively well-developed in the area, though some rural communities experience intermittent access to essential services. The project's infrastructure development will help enhance these services.

By understanding the socioeconomic conditions, the ESIA helps to predict how the project will affect local livelihoods and community well-being. Engagement at the community level through focus groups discussions in October identified vulnerable ground and sensitive social receptors.

8 Stakeholder Engagement

The objectives of stakeholder engagement for the purpose of the ESIA were to

1. Continuously informing the interested and affected parties about the Project-related development activities;
2. Ensuring that the interested and affected parties are informed about the hazards associated with construction, operation activities of the Project and mitigation measures implemented by Azerenerji to reduce impacts where possible;
3. Minimising potential disputes between Contractors, service providers and the local communities;

4. Incorporating local knowledge during the entire Project lifecycle, by taking into account bottom up information and feedback provided by interested and affected parties; and
5. Timely and effectively responding to concerns of affected parties regarding the issues such as employment of the local workforce reserve in the construction and operation phases, disruption to daily activities, safety issues, disturbances due to noise or dust, and other environmental and social issues.
6. Hiring of local workers, particularly those impacted by the project.

8.1 Methods of Engagement:

In accordance with ESS10 , stakeholder engagement will be in place throughout the project implementation phase. This will be achieved through various engagement methods, including community meetings, mass and social media communication, information desks, and targeted measures to ensure the inclusion and participation of vulnerable groups, and information disclosure.

The Stakeholder Engagement Plan prepared for the project will be implemented by Azerenerji and is outlined below:

Stakeholders will be made aware of construction schedules and potential disruptions, as well as land acquisition processes in line with the Resettlement Policy Framework (RPF) and Resettlement Action Plan (RAP), and applicable national/international regulations. Access agreements will be negotiated with landowners to minimise disruptions. Azerenerji will ensure regular monitoring of environmental and social performance, maintaining open communication, and addressing concerns and complaints promptly. Regular meetings, site visits, and feedback mechanisms will be used to enhance stakeholder engagement. Information centers and various communication tools will be used to ensure stakeholders' access to project information to maximise their participation in the engagement process effectively.

8.2 Engagement to date:

The Consultant, together with Azerenerji, conducted a detailed collection of baseline socio-economic data to determine the social and economic impact on people living in the Project AoI. Information, including census data, maps and reports, was collected from various sources. The following engagement were carried out:

- Collection of available information, data, maps and reports from AzerEnerji, government statistics, and local municipalities
- Onsite surveys of historical and cultural heritage, study and summarization of the past survey and excavation results.
- Interviews with EA representatives and local self-government leaders to obtain information, opinions and suggestions in July 2024
- Public consultations on ESF documents (Scoping Report, RPF, Stakeholder Engagement Plan (SEP), Labor Management Procedures (LMP)) and focus group consultations with community representatives in all project affected communities from September 30 to October 2, 2024.

8.3 Grievance Management

The SEP has been prepared for AZURE project in conformance with ESS 10, which provides the principles, objectives and procedures to be followed to develop a strong and constructive relationship with stakeholders throughout the Project lifecycle, in line with the Company's Policies and in line with the World Bank requirements. The SEP covers regulatory framework, stakeholder identification, engagement program, roles and responsibilities, GRM and M&E.

A GRM within the SEP framework will be established by Azerenerji to effectively address concerns and grievances from project-affected parties regarding the environmental and social performance of the project. A similar GRM will be established within RAP in future stages to allow appeals against contested decisions, practice or activity arising from land or other assets compensation. A grievance mechanism will be provided for all direct and contracted workers to raise workplace issues and concerns within the LMP framework. The purpose of a grievance mechanism is to demonstrate responsiveness to stakeholder needs to ensure that grievances are managed promptly, effectively, and transparently, at no cost to the individuals involved, and without fear of retaliation. The GRM will provide clear procedures for grievance submission, including protocols for serious grievances, registration, management, and the appeals process. The grievances will be addressed through various steps, namely Grievance Redress Commission (GRC), Azerenerji PIU, and Court of Law within the SEP framework, and local Azerenerji, GRC and Ministry of Finance level within RAP, and AZURE project level, PIU level and Azerenerji level within LMP The handling of grievances will be conducted in a discreet, objective, and sensitive manner, ensuring responsiveness to the needs and concerns of affected parties. The GRM will be implemented as per ESIA, RAP and SEP framework in the future stages.

9 Impact Assessment

The assessment identifies potential environmental and social impacts throughout the project phases, including construction and operation, and suggests mitigation strategies. The project mainly involves overhead transmission lines (OHL) and other power transmission facilities. The geographic coverage includes 200-meter-wide corridors around the OHLs and 500-meter buffer zones around substations, with wider areas for certain impacts.

9.1 Impact Sources and Receptors

The main Impact Sources are:

- Construction activities for OHLs and transmission facilities.
- Vehicles and equipment used in the construction and operation.
- Fuel combustion during project activities.
- Operation of the OHLs and potential land use constraints within the easement.

Environmental Receptors include air quality, climate, noise, water, land, and biodiversity. Their sensitivity is determined by ecological, economic, and cultural factors.

Social receptors include local communities, farmers, historical heritage sites, and other stakeholders who are sensitive to socio-economic impacts. For example, 39 settlements are identified near project sites, and the distance between these settlements and project activities is a key factor in assessing social impact. The sensitivity of social receptors is based on the potential changes to their economic activities, health, education, and overall well-being, including in particular PAPs affected by land acquisition and/or land use limitations.

9.1.1 Impact Classifications

Impacts are classified by type (direct/indirect), duration (short/mid/long-term), spread (localized/widespread), and probability (low to high). These impacts vary in magnitude from negligible to high and are assessed through modelling, comparative analysis, and stakeholder consultations.

9.1.2 Mitigation Measures

Mitigation measures fall into categories such as:

- Prevention – Avoiding impacts by altering project designs.
- Minimization – Reducing adverse effects where prevention isn't possible.
- Rehabilitation – Restoring areas post-construction.
- Compensation – Providing alternatives when prevention or mitigation is unfeasible.

9.2 Potential impacts

This section briefly summarises the potential impacts for each of the main environmental topics.

9.2.1 Air Quality Impacts

Sources of Impact include:

- Construction activities resulting in release of dust and pollutants.
- Emissions from vehicles and equipment.
- Wildfires and corona discharge (which releases ozone and nitrogen oxides) during operation.

Mitigation Measures:

- For Dust: Regular watering of construction sites, limiting vehicle speed, and using covers for transporting materials.
- For Pollutants: Efficient transportation routes, modern equipment, and continuous monitoring.

9.2.2 Noise, Vibration, and Light Pollution

Noise, Vibration and Light Impact Sources include:

- Heavy machinery during construction.
- Transportation and pile driving.
- Pile driving, excavation, and other heavy machinery operations.
- Security and construction lighting during night hours.

Mitigation includes using quieter machinery, establishing noise barriers, limiting work hours, and using shielded lighting fixtures to reduce light pollution.

9.2.3 Soil and Water Quality Impacts

Soil Impacts include soil removal and disturbance from excavations, which can lead to soil erosion, contamination, and fertility loss. Contamination Risks could arise from fuel spills, leaks from machinery, and improper waste disposal and could pose significant contamination risks.

Mitigation measures include soil management plans, proper waste handling, and spill prevention strategies. Additionally, rehabilitating areas post-construction and limiting disturbance to vegetation can help mitigate soil impacts.

Water Impacts can arise from construction activities that could affect surface and underground water resources due to erosion and runoff. Contaminants from construction materials, vehicles, and accidental spills can pollute water resources.

Mitigation involves creating proper drainage systems, controlling runoff, and establishing water quality monitoring protocols throughout the project life cycle.

9.2.4 Socioeconomic impacts

OHL construction and operation can significantly impact the socioeconomic situation in the Project area, imposing both potential adverse and positive types of the impacts. This section assesses potential impacts of the different phases of the AZURE Project on the main socioeconomic parameters of the Project area communities and suggests respective impact mitigation activities.

Potential impacts can arise from:

- lack of information and stakeholder engagement process
- grievances not dealt with appropriately or on time
- temporary influx of workers from outside local areas
- poor labour and working conditions
- works-site access and management
- disturbance and nuisance from works
- community worker and worker-worker interactions
- risks and impacts to biophysical impacts with resultant impact to neighbouring households and communities
- land acquisition and displacement
- restrictions on land use and future development in relation to the power infrastructure
- damage or restrictions of access to cultural spaces.
- community health and safety risks
- Non-compliance with environmental and social management plan
- community concerns on potential exposure to electromagnetic fields during operation

Mitigation measures can be expected to include:

- Implementation of an effective Stakeholder Engagement Plan, Labour Management Procedures, Resettlement Policy Framework and once developed the Resettlement Action Plan/s and which are compliant to World Bank standards, including grievance mechanisms.
- Effective community health and safety plan implementation, traffic management plan and effective communication with all local communities and individuals.

9.2.5 Cumulative and Residual Impacts

Cumulative Impacts are the combined effects of past, present, and future project activities on the environment and social fabric. They are assessed through various methods, including calculations and spatial analysis to predict long-term outcomes.

Residual Impacts refer to the impacts that remain after all mitigation efforts have been implemented. For air quality, noise, and water, these residual effects are expected to be short-term and negligible, provided the recommended mitigation measures are followed.

If the social management plans are implemented effectively there can be expected to be very limited residual social impacts. An effective grievance mechanism, operationalised at the worksite and community level, will also help ensure risks and impacts are well managed and systems failures come to light.

9.3 Environmental and Social Management Plan

ESMP covers the principles, objectives and requirements appropriate for the implementation of effective environmental and social management during all phases of the Project. The Project developer will be assigned with the following responsibilities for the management of the natural and socioeconomic environment within all project phases:

- Prevent or mitigate potential adverse impacts;
- Increase effect of the potential positive impacts;
- Ensure timely and effective implementation of the impact management measures provided for in the ESIA; and
- Monitor and feedback for the positive and adverse impact management process.

Within the Project, various responsibilities will be assigned to the different parties involved in project development. Azerenerji is ultimately responsible for the successful implementation and monitoring of ESMP, whilst Construction contractors will be charged with development, implementation and monitoring of thematic sub-management plans such as biodiversity, health and safety, pollution prevention and traffic management. Each of the thematic sub-management plans along with the overall ESMP will require to be implemented and monitored during the project phases, with periodic feedback (and corrective actions if necessary) provided to Azerenerji and WB. Additional biodiversity studies will be implemented from fall 2024 to spring 2025, covering migration, wintering and breeding/nestling seasons for birds and other species which can potentially trigger identification of critical habitats in the vicinity of protected areas. The findings of the studies will inform updates of the ESIA, ESMP, Biodiversity Management Plan (BMP), Contractor's ESMP and detailing of site-specific mitigation measures. Until then, contractor will be required to undertake civil works in those sections of the alignment which do not intersect with international bird flyways and are not in the vicinity of protected areas.

9.4 Conclusions

The ESIA conducted to date has identified a number of wide-ranging potential environmental adverse impacts that could arise from Project implementation, including biodiversity related, in particular, to bird strike on overhead power lines; potential soil and water contamination issues. Potential social risks and impacts include relate to works to support the construction of the extension and reinforcement of AzerEnerji grid and include (a) adverse and potentially disproportionate impacts to disadvantaged/vulnerable communities depending on siting choices; (b) labour and working conditions risks during construction and operation; (c) community health and safety risks during construction and operation; (d) sexual exploitation and abuse/sexual harassment (SEA/SH) risks primarily during construction depending on the size and sourcing of the workforce; (e) permanent and temporary land acquisition or easement restrictions impacting livelihoods; (f) risks of physical resettlement; (g) risks to cultural heritage; and (h) risks relating to inadequate stakeholder engagement and grievance management.

The project is required to develop ESMPs and ensure their effective implementation. If all these plans are implemented efficiently and successfully the project should result in negligible adverse E&S risks impacts. The Labour Management Procedures and Resettlement Policy Framework are in place, the Stakeholder Engagement Plan is currently being revised following the initial phase of this ESIA. However, it must be recognized that much of the field work has yet to be done, mainly related to land acquisition and preparation and implementation activities such as household surveys, asset inventory and valuation, consultations with people and payment of compensation, etc., followed by numerous rounds of public consultations and focus group discussions. Within the mobilisation period, the Contractors will develop the site-specific ESMPs, including the following thematic management plans such as Dust Management Plan, Air Emission Management Plan, Noise Management Plan, Waste Management Plan, Construction Waste Management Plan, Industrial Waste Management Plan, Solid Waste Management Plan, Wastewater Management Plan, Influx Management Plan, Traffic Management Plan, Vegetation Management Plan, Biodiversity Management Plan, Cultural Heritage Management Plan) .

Additional bird studies will be conducted to assess impacts on bird migration and natural habitats, including potentially critical habitats. The findings of these additional biodiversity studies will inform updates of the ESIA, ESMP, Biodiversity Management Plan and Contractor's ESMP. .

Azerenerji will undertake stakeholder engagement during the ESIA disclosure process. The ESIA report and related Environmental and Social risk management documents will be made accessible in Azerbaijani, and widespread access to information will be ensured through national and regional offices of Azerenerji, websites of Azerenerji and WB, public notices, local media, and community centers by the end of October. Public consultations with the stakeholders, including those affected by the project's activities, local self-governance institutions, executive authorities, regional and national government organisations, local and regional private businesses, NGOs, CBOs, research institutions and media will be organised within the first decade of November. Feedback from these consultations will be considered for project design and mitigation measures, with clear communication to stakeholders about how their input influenced project decisions. Additionally, the ESIA will be updated based on new studies on bird migration, with findings shared during community consultations. The

functioning of the GRM, and the contact details of the Contractor and PIU's Stakeholder Engagement Specialist will be made available to the stakeholders.

Contact details to liaise with Azerenerji will be defined as below:

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