

Environmental and Social Impact Assessment

PUBLIC

Project Number: 57342-001
Draft
December 2023

Uzbekistan: Kungrad 1 Wind Power BESS Project

PART 1

Prepared by ACWA Power and ECO Consult for the Asian Development Bank (ADB).

This environmental and social impact assessment report is a document of the borrower. The views expressed herein do not necessarily represent those of ADB's Board of Directors, Management, or staff, and may be preliminary in nature. Your attention is directed to the ["terms of use"](#) section of ADB's website.

In preparing any country program or strategy, financing any project, or by making any designation of or reference to a particular territory or geographic area in this document, ADB does not intend to make any judgments as to the legal or other status of any territory or area.

Environmental & Social Impact Assessment (ESIA)

Kungrad 1.5GW Wind Farm in Uzbekistan



REV-3

December 2023

Issue and Revision Record:

Template Code		QF-PM-01-15	Template Revision No.	REV-0
Version	Date	Description	Prepared By	Approved by
REV 0	21 Sep 2023	Draft ESIA Report	1. ECO Consult 2. Turnstone Ecology 3. Green Business Innovation	Ibrahim Masri / Project Manager
REV 1	12 Oct 2023	Draft ESIA Report (comments from ACWA Power)	1. ECO Consult 2. Turnstone Ecology 3. Green Business Innovation	Ibrahim Masri / Project Manager
REV 2	30 Nov 2023	Draft ESIA Report (comments from IBIS, ADB and addition of OHTL section)	1. ECO Consult 2. Turnstone Ecology 3. Green Business Innovation	Ibrahim Masri / Project Manager
REV 3	19 Dec 2023	Draft ESIA Report (Additional comments from ADB)	1. ECO Consult 2. Turnstone Ecology 3. Green Business Innovation	Ibrahim Masri / Project Manager

Disclaimer:

This report should not be relied upon or used for any other project without an independent check being carried out as to its suitability and prior written authority of ACWA Power being obtained. ECO Consult accepts no responsibility or liability for the consequence of this document being used for a purpose other than the purposes for which it was commissioned.

This report is confidential to ACWA Power, and the Consultant accepts no responsibility of whatsoever nature to third parties whom this Report, or any part thereof, is made known. Any such party relies upon this report at their own risk.

TABLE OF CONTENT

Table of Content	ii
List of Figures	vi
List of Tables	x
Abbreviation and Acronyms	xiii
1. Introduction	1
1.1 Background	1
1.2 The Environmental and Social Impact Assessment (ESIA) Report	1
1.3 Project Setup and Responsibilities	2
1.4 Document Structure.....	3
2. Project Description	5
2.1 Project Location	5
2.2 Local Communities.....	8
2.3 Project Components	9
2.4 Overview of Project Phases.....	18
2.5 Project Schedule	20
2.6 Workforce Requirements	20
3. ESIA Approach and Methodology	21
3.1 Analysis of Alternatives	21
3.2 Stakeholder Consultations and Engagement	21
3.3 Delineation of Study Boundaries and Scope Assessment.....	21
3.4 Impacts Assessment Methodology	24
3.5 Development of Environmental and Social Management Plan (ESMP).....	28
4. Analysis of Alternatives	29
4.1 Site Selection Alternatives	29
4.2 Technology Alternatives	34
4.3 Design Alternatives	37
4.4 No-Project Alternative	38
5. Regulatory and Policy Framework	40
5.1 Environmental Clearance Process in Uzbekistan	40
5.2 Uzbekistan E&S Regulatory Context.....	41
5.3 International Agreements	45
5.4 Requirements for Project Financing.....	46
6. Stakeholder Consultation and Engagement	56
6.1 Objectives.....	56

6.2	Stakeholder Identification and Analysis	56
6.3	Stakeholder Consultation and Engagement to Date	63
6.4	Future Stakeholder Engagement and Consultation	89
7.	Overview of Strategic Environmental and Economic Impacts	92
7.1	Governmental Vision for the Energy Sector.....	92
7.2	Energy Security.....	92
7.3	Environmental Benefits	93
7.4	Overview of Project Specific E&S Impacts	93
8.	Landscape and Visual	97
8.1	Assessment of Baseline Conditions.....	97
8.2	Assessment of Impacts.....	100
9.	Land Use.....	120
9.1	Assessment of Baseline Conditions.....	120
9.2	Assessment of Impacts.....	125
10.	Geology, Hydrology, and Hydrogeology.....	126
10.1	Assessment of Baseline Conditions.....	126
10.2	Assessment of Impacts.....	137
11.	Biodiversity.....	146
11.1	Assessment of Baseline Conditions.....	146
11.2	Assessment of Impacts.....	219
11.3	Monitoring	247
11.4	Off Setting	248
11.5	Potential Wider Conservation Benefits of the Project (compensation / off-setting)	249
12.	Archeology and Cultural Heritage	251
12.1	Assessment of Baseline Conditions.....	251
12.2	Assessment of Impacts.....	275
13.	Air Quality and Noise	279
13.1	Assessment of Baseline Conditions.....	279
13.2	Assessment of Potential Impacts	281
14.	Infrastructure and Utilities	285
14.1	Assessment of Baseline Conditions.....	285
14.2	Assessment of Potential Impacts	296
15.	Worker Welfare, Health and Safety.....	322
15.1	Assessment of Baseline Conditions.....	322
15.2	Occupational Health and Safety Impacts during Construction and Operation	322
15.3	Worker Accommodation Impacts during Construction and Operation	326

15.4	Potential Impacts from Blasting Activities	328
15.5	Worker Human Rights Impacts during Construction and Operation	329
16.	Community Health, Safety and Security	333
16.1	Assessment of Baseline Conditions.....	333
16.2	Assessment of Potential Impacts	334
17.	Socioeconomics	340
17.1	Assessment of Baseline Conditions.....	340
17.2	Assessment of Potential Impacts	349
18.	Climate and Meteorology	353
18.1	Assessment of Baseline Conditions.....	353
18.2	Assessment of Potential Impacts	360
19.	Human Rights and Gender Assessment	361
19.1	Overview of Human Rights and Gender Context in Uzbekistan	361
19.2	The Labor Code in Uzbekistan.....	366
19.3	Classification of Identified Human Rights Risks	377
19.4	Mitigation Measures	381
20.	Climate Change Risk Assessment	386
20.1	Project GHG Emissions.....	386
20.2	Compatibility with Host Country Climate Change Commitments.....	387
20.3	Sea Level Rise and Riverine Floods	389
20.4	Urban Floods.....	390
20.5	Temperature Increase and Heat Waves	390
20.6	Extreme Weather Events.....	394
20.7	Wildfires.....	396
20.8	Infectious Diseases.....	398
20.9	Water Scarcity and Drought.....	400
21.	Assessment of Cumulative Impacts.....	405
22.	Environmental and Social Management Plan (ESMP).....	408
22.1	Institutional Framework and Procedure Arrangements	408
22.2	Environmental, Social, Health, and Safety Management System (ESHS-MS)	411
22.3	Other ESHS Requirements for Temporary Facilities	413
22.4	Compilation of the Framework Environmental and Social Management Plan (ESMP)	414
23.	Overhead Transmission Line (OHTL).....	452
23.1	Background	452
23.2	Project Description.....	452
23.3	Analysis of Alternatives.....	478

23.4	Landscape and Visual	488
23.5	Land Use.....	493
23.6	Archeology and Cultural Heritage	497
23.7	Water Resources	504
23.8	Infrastructure Elements	507
23.9	Biodiversity.....	510
23.10	Other Issues	574
24.	Annexes.....	579
24.1	Annex 1 – Detailed Regulatory Review	579

LIST OF FIGURES

Figure 1: Region Division of Uzbekistan	6
Figure 2: District Divisions in Karakalpakstan	8
Figure 3: Project Site and Closest Communities	9
Figure 4: Typical Structural Components of a Wind Turbine and Wind Farm	10
Figure 5: Preliminary WTG Layout	11
Figure 6: Internal Substation Options	13
Figure 7: Typical Substation	13
Figure 8: Map of Internal Roads	14
Figure 9: Typical BESS	15
Figure 10: Access Road	15
Figure 11: Typical Mobile Batching Plant	17
Figure 12: Typical Borrow Pit	17
Figure 13: Study Area.....	22
Figure 14: Land Plot Provided by Government for Selection of Project Boundary	29
Figure 15: Project Site in Relation to KBAs.....	30
Figure 16: Identified E&S Constraints - Archeological Sites	31
Figure 17: Identified E&S Constraint - Land Plot provided by the Government	32
Figure 18: Identified E&S Constraint - Community Settlements.....	33
Figure 19: 4,600km ² area, Project Site and E&S Constraints Identified	34
Figure 20: Solar Resource Map for Uzbekistan	35
Figure 21: Water Resources in Uzbekistan	36
Figure 22: Existing tracks and Final Roads	38
Figure 23: Sample Photos from the Meeting.....	77
Figure 24: Sample for Announcements	78
Figure 25: FGD with Ozodlik	83
Figure 26: FGD with Elobod Community.....	83
Figure 27:FGD with Kirkkiz	84
Figure 28: FGD with Jasliq.....	84
Figure 29: Selected Photos of the Workshop	86
Figure 30: Sample Photos from the Meeting.....	89
Figure 31: General Site Topography and Landscape	98
Figure 32: 3D DEM Modeling of the Project Site	98
Figure 33: Zone of Theoretical Visibility.....	102
Figure 34: Land Ownership for the area	122
Figure 35: Historical Land Use of the Project site	123
Figure 36: Some of Unidentified Objects Onsite	124
Figure 37: Geological Map and Ground Investigation Locations of the Project Site	127
Figure 38: Regional Sedimentary Geology of Uzbekistan	128
Figure 39: Soil Types and Formations in Karakalpakstan Region	129
Figure 40: Mechanical Composition of Soils (FAO-DSMW).....	130
Figure 41: Project Site in Relation with Earthquake Zones and Past Adjacent Earthquakes with M>5	131
Figure 42: Water Resources of the Aral Sea Basin	133
Figure 43: Project Site in Relation with the Closest Water Bodies.....	134
Figure 44: Project Site's Study Area in Relation to The Sub-Basins and The River/Channel Network	135
Figure 45: Mineralization of Groundwater	137
Figure 46: 3D DEM of the Project Site	138
Figure 47: Water Depths within the Project Site Due to 100-Year Storm	139
Figure 48: Anabasis-saltwort-sagebrush community (Artemisia terrae-albae Krasch., Anabasis eriopoda (Schrenk) Paulsen, A. cretacea Pall., Caroxylon orientale (S.G.Gmel.) Tzvelev)	169
Figure 49: Saltwort-sagebrush community (Artemisia terrae-albae Krasch., Caroxylon orientale (S.G.Gmel.) Tzvelev) with Atraphaxis spinosa L.	169

Figure 50: Solitary tree of Black Saxaul (*Haloxylon ammodendron* (C.A.Mey.) Bunge) among the gypsum desert 170

Figure 51: Takyr (periodically inundated loamy depressions with very sparse vegetation)..... 170

Figure 52: Takyr (periodically inundated loamy depressions with very sparse vegetation)..... 171

Figure 53: White saltwort (*Xylosalsola arbuscula* (Pall.) Tzvelev) 171

Figure 54: Vehicle tracks modified (lost) habitat within the Project AoI 172

Figure 55: Vehicle tracks modified (lost) habitat along track from Kirkkiz to site..... 172

Figure 56: Reptile Survey Transects – Spring Routes Blue, Summer Routes Yellow..... 174

Figure 57: Location of Camera Traps – First Deployment (February to March 2023) 177

Figure 58: Location of Camera Traps – Second Deployment (April to ongoing) 178

Figure 59: Location of Honey Badger Camera Trap Records 182

Figure 60: Goitered Gazelle records by camera traps 184

Figure 61: Caracal Records by Camera Traps 186

Figure 62: Location of Static Bat Detectors (red dots – ground location, yellow pins – at height) 188

Figure 63: SM4BAT microphone 189

Figure 64: Location of Vantage Points..... 198

Figure 65: Location of Bird Survey Transects 203

Figure 66: Cumulative Daily Totals – Steppe Eagle Winter Survey Period 209

Figure 67: Cumulative Daily Totals – Steppe Eagle Autumn Migration Survey Period 210

Figure 67: Cumulative Daily Totals – Eastern Imperial Eagle Autumn Migration Survey Period 210

Figure 68: Location of Active Long-legged Buzzard Nests in the Project Area 214

Figure 69: Project Site and Archeological Sites 254

Figure 70: Archeology and Cultural Heritage 274

Figure 71: Sample of Burials Onsite 274

Figure 72: Location of Monitoring Points 280

Figure 73: Water Demand Distribution in Uzbekistan 291

Figure 74: Project Site in Relation to Highway A380..... 293

Figure 75: Gas Pipeline and Infrastructure Onsite 294

Figure 76: Overlap between Project Area State Committee on Geology Recommendation 295

Figure 77: Fresnel Zone of Broadcasting Towers..... 297

Figure 78: Assake Audan Groundwater Well with the Project Site Location 305

Figure 79: Assake Audan Groundwater Well 306

Figure 80: Gurbek Groundwater Well location within the Project Site 307

Figure 81: Gurbek Groundwater Well 308

Figure 82: Water Supply under Urgench transgaz along the A380 highway 309

Figure 83: Transport and Road's Constraints 314

Figure 84: Proposed Transportation Routes 317

Figure 85: Project Site and Closest Communities 333

Figure 86: Average Monthly Maximum and Minimum Temperatures for the Past 30 Years 354

Figure 87: Average Monthly Wind Speeds for the Past 30 Years 355

Figure 88: Wind Speed Patterns in Karakalpakstan Over the Past 30 Years 355

Figure 89: Wind Rose of Karakalpakstan..... 356

Figure 90: Average Monthly Rainfall Distribution in Karakalpakstan for the Past 30 Years 357

Figure 91: Snow Days in Karakalpakstan..... 357

Figure 92: Number of Days with Temperatures Higher Than 40 Degrees Celsius in Uzbekistan 359

Figure 93: Months Characterized by Temperatures Surpassing 40 Degrees Celsius..... 359

Figure 94: Number of Cold Days Below 0°C in Karakalpakstan 360

Figure 95: Elevation Change between Project Site and Aral Sea (up) and Ama Daru River (bottom)..... 389

Figure 96: Average Monthly Temperature and Rainfall in Uzbekistan, 1991–2020..... 390

Figure 97: Mean Temperature in Uzbekistan (1950-2020) 391

Figure 98: Project Maximum Temperature Increase (left) and Minimum Temperature Increase (Right) 391

Figure 99: Historic (1986–2005) and Projected Annual Count of Days in which Temperatures Surpass 35°C ... 392

Figure 100: Think Hazard – Hazard Level for Karakalpakstan for Extreme Heat 393

Figure 101: Think Hazard – Hazard Level for Karakalpakstan for Landslide 395

Figure 102: Think Hazard – Hazard Level for Karakalpakstan for Earthquakes 396

Figure 103: Think Hazard – Hazard Level for Karakalpakstan for Wildfires.....	397
Figure 104: Project Habitat with Shrub Vegetation	397
Figure 105: Think Hazard – Hazard Level for Karakalpakstan for Water Scarcity.....	402
Figure 106: Other Development Projects within the Region	405
Figure 107: Region Division of Uzbekistan	453
Figure 108: District Divisions in Karakalpakstan	454
Figure 109: District Divisions in Khorazm Region.....	456
Figure 110: District Divisions in Bukhara Region	457
Figure 111: Project Site and Closest Communities	458
Figure 112: Project OHTL	459
Figure 113: Parallel and Single OHTLs.....	460
Figure 114: Key Components of a Transmission Tower	461
Figure 115: Heights and Distance for Transmission Towers	462
Figure 116: Footprint for the PB4 Tower	462
Figure 117: Angle Towers and Change of Direction	463
Figure 118: Heights and Distance for Transmission Towers	464
Figure 119: Project Switching Stations.....	466
Figure 120: Typical Substation	466
Figure 121: Typical Mobile Batching Plant	468
Figure 122: Right of Way and Access Road for OHTL (IFC, 2007).....	470
Figure 123: Sanitary Protection and Security Zones for Transmission Towers for 1 OHTL.....	471
Figure 124: Sanitary Protection and Security Zones for Angle Towers for 1 OHTL	471
Figure 125: Sanitary Protection and Security Zones for 2 OHTLs	472
Figure 126: KBAs and National Protected Areas Around the Project	479
Figure 127: Archeological Site Surrounding the 500kV SS Nukus - SS Sarymay Part of the Project	480
Figure 128: Archeological Site Surrounding the 500kV SS Sarymay - SS Karakul Part of the Project.....	480
Figure 129: Archeological Site Surrounding the 500kV SS Ustyurt_WPP - SS Nukus Part of the Project.....	481
Figure 130: Alternative Routes to Avoid Agricultural Lands with Bypasses In Karakalpakstan	482
Figure 131: Alternative Routes to Avoid Agricultural Lands with Bypasses in Bukhara	483
Figure 132: Project Site and Surrounding Airports	483
Figure 133: Project Site and Existing Railways	484
Figure 134: Closest Community Settlements.....	485
Figure 135: Project Site with Surrounding Water Bodies.....	486
Figure 136: Military Area Adjacent to the Project	486
Figure 137: General Landscape and Visual within the Project.....	488
Figure 138: Key Points with Drastic Changes in Topography Along the Route.....	489
Figure 139: Archeological Site Surrounding the 500kV SS Nukus - SS Sarymay Part of the Project	499
Figure 140: Archeological Site Surrounding the 500kV SS Sarymay - SS Karakul Part of the Project.....	499
Figure 141: Archeological Site Surrounding the 500kV SS Ustyurt_WPP - SS Nukus Part of the Project.....	500
Figure 142: Archeological Sites Avoided by the Project.....	501
Figure 143: Key Water Resources that Cross the Project.....	505
Figure 144: Water Canals within the Project Site and Example Figure	505
Figure 145: Observed Unknown Pipelines	508
Figure 146: IBAT results protected areas within 50 km	512
Figure 147: IBAT results key biodiversity areas within 50 km	513
Figure 148: Sections for Biodiversity Assessments	521
Figure 149: Section 1 – Ustyurt Substation to the western edge of the Agriculture Area	522
Figure 150: Section 2 – Agriculture Area to Nukus Substation	522
Figure 151: Section 3 – Nukus Substation to Land to the north-east of Taza-Kel'teminar.....	523
Figure 152: Section 4 – Land to the north-east of Taza-Kel'teminar to Karakul Substation.....	524
Figure 153: Scheme of Uzbekistan's botanical and geographical regions	527
Figure 154: Locations of the three most representative transects along OHTL route – Section 1	535
Figure 155: Locations of the transects along OHTL route – Section 2	536
Figure 156: Locations of the transects along OHTL route – Section 3	536

Figure 157: Locations of the transects along OHTL route – Section 4	537
Figure 158: Location of OHTL Vantage Points (northern and central section).....	545
Figure 159: Location of OHTL Vantage Points (southern section).....	546
Figure 160: Typical EMF Levels for Power Transmission Lines	576

LIST OF TABLES

Table 1: Overall ESIA Structure	3
Table 2: Region Divisions of Uzbekistan	5
Table 3: District Divisions of Karakalpakstan	7
Table 4: Worst-Case WTG Specifications	11
Table 5: Footprint of the Project Components	18
Table 6: Determination of Significance	26
Table 7: National Legislation and Guidelines Governing the E&S Compliance for the Project	41
Table 8: Relevant International Conventions and Agreements	45
Table 9: IFC Performance Standard Requirements	46
Table 10: Summary of Equator Principles	48
Table 11: Overview of Key Points of EBRD Performance Requirements of Relevance to the Project	51
Table 12: ADB SPS Requirements	53
Table 13: Other International E&S Requirements and Standards	54
Table 14: Identified Groups of Stakeholders	57
Table 15: List of Vulnerable Groups and Their Relevance	61
Table 16: Overall Summary of Targeted Consultations	64
Table 17: Outcomes of FGD	80
Table 18: Summary of Anticipated Impacts during the Planning Phase	94
Table 19: Summary of Anticipated impacts during the Construction Phase	94
Table 20: Summary of Anticipated Impacts during the Operations Phase	95
Table 21: Critical Visual Receptors	99
Table 22: Visual Receptor Sensitivity	104
Table 23: Definition of Magnitude of Visual Impact	105
Table 24: Significance of Visual Effects	106
Table 25: Viewpoint Analysis	118
Table 26: Annexes to the EU Birds Directive	147
Table 27: Criteria and Conditions for Identifying Critical Habitats and Priority Biodiversity Features*	149
Table 28: Criteria for Determining the Sensitivity of Valued Ecological Receptors	155
Table 29: Populations of IBA Trigger Species	157
Table 30: Populations of IBA Trigger Species	158
Table 31: Species of Global Conservation Concern	159
Table 32: Calculation of Habitat Condition Scores	160
Table 33: Results of Spring 2023 Survey	161
Table 34: Results of Summer 2023 Survey	162
Table 35: Results of the Spring and Summer Reptile Surveys	176
Table 36: Results of the 2023 Mammal Survey, Incidental Survey, Eagle Owl Pellet Analysis and Camera Trap Survey	179
Table 37: Total Number of Recording Nights and Number of Data Files (April to August)	189
Table 38: Recording Nights and Data by At Height Detector	190
Table 39: Recording Nights and Data by Ground Detector (Period 1) (April to May)	190
Table 40: Recording Nights and Data by Ground Detector (Period 2) (May – July)	191
Table 41: Number of Recorded Files (Period 3 July to August)	191
Table 42: Bat Species Most Likely to Occur in the Project Aol	192
Table 43: Bat Species Most Likely to Occur in the Project Aol	192
Table 44: Calls per Night from Ground-based Detectors (Period 1 and 2)	194
Table 45: Calls per Night from Met Mast Detectors (Period 1 and 2)	194
Table 46: Calls per Night from Met Mast Detectors (Period 3)	194
Table 47: Target (Tier 1) Species	199
Table 48: Results of Winter, Spring, Summer and Interim Autumn Vantage Point Surveys – Notable Species or Registrations	206
Table 49: Combined (Yearly) Counts of Notable Species and Records and Number of at-Risk Flights Recorded by Species	208

Table 50: Registration of MacQueen’s Bustard during the Spring Migration Period	211
Table 51: Coordinates of Active and Abandoned Steppe Eagle Nests in the Project Area	213
Table 52: Coordinates of Active Long-legged Buzzard Nests in the Project Area	213
Table 53: Summary of Sensitive Receptors Species	216
Table 54: Habitat Areas being Affected by Construction	219
Table 55: CRM Output	238
Table 56: Archeological and Historical Sites.....	253
Table 57: Outcomes of Archeology and Cultural Heritage Survey	255
Table 58: Location of Monitoring Points	280
Table 59: Applicable National Ambient Air Quality Permissible Limits.....	280
Table 60: Applicable National Permissible Limits for Noise	281
Table 61: IFC and EU Limits for Noise and Air Quality	281
Table 62: Closest Landfill to the Project Site	286
Table 63: Closest WWTPs to the Project Site	287
Table 64: Disposal Methods for Hazardous Wastes	287
Table 65: Water Supply from LADB	289
Table 66: Current Coverage y Centralized Water Supply and Water Sources in Karakalpakstan	290
Table 67: Water Demand in Karakalpakstan	291
Table 68: Type and Quantities of Waste Estimated for Construction Phase	298
Table 69: Total Water Requirements Summary	301
Table 70: Potable Water Requirements	301
Table 71: Non-Potable Water Requirements	302
Table 72: Summary of Peak Vehicles	312
Table 73: Project and Existing Traffic	318
Table 74: Socio-Economic Conditions for the Local Communities	341
Table 75: List of Vulnerable Groups and Their Relevance	348
Table 76: Average Humidity Levels	358
Table 77: Benchmarking National Legislation Against International Standards.....	367
Table 78: Classification of Human Rights Risks	377
Table 79: Uzbekistan Policies and Strategies on Climate Change	388
Table 80: Communicable Diseases in Uzbekistan	398
Table 81: Country Strategies Addressing Water Issues	403
Table 82: Roles and Responsibilities of Entities Involved in ESMP	408
Table 83: Training Elements	409
Table 84: Inspection and Monitoring Elements	410
Table 85: Required Meetings	410
Table 86: Reports	411
Table 87: ESMP for the Planning Phase	415
Table 88: ESMP for the Construction Phase.....	416
Table 89: ESMP for the Operation Phase	437
Table 90: Region Divisions of Uzbekistan.....	452
Table 91: District Divisions of Karakalpakstan.....	454
Table 92: District Divisions of Bukhara and Khorazm Regions	455
Table 93: Local Communities within a 5km Buffer Area from the Project	457
Table 94: Number of Towers for the OHTL.....	461
Table 95: Number of Angle Towers for the OHTL	464
Table 96: Type of Towers, Height and Footprint	464
Table 97: Permanent Land Acquisition Requirements	473
Table 98: Temporary Land Acquisition	473
Table 99: List of Permits Obtained to Date for OHTL Development	474
Table 100: Critical Visual Receptors	490
Table 101: Critical Visual Receptors Across the OHTL.....	490
Table 102: List of Archeological Sites of Importance from the Department of Archeology	500
Table 103: Project’s Points of Intersection with Oil and Gas Infrastructure	508

Table 104: Criteria for Determining the Sensitivity of Valued Ecological Receptors 510

Table 105: Populations of IBA Trigger Species 514

Table 106: Populations of IBA Trigger Species 516

Table 107: Populations of IBA Trigger Species 517

Table 108: Populations of IBA Trigger Species 518

Table 109: Species of Global Conservation Concern..... 518

Table 110: Description of Sections..... 521

Table 111: Calculation of Habitat Condition Scores 525

Table 112: List of Plant Species Recorded along OHTL Corridor Quadrats (2x2) During June Survey 2023..... 531

Table 113: List of Potential Reptile and Amphibian Species 538

Table 114: List of Potential Vertebrate Species..... 541

Table 115: Species of conservation concern considered to be of higher risk 565

Table 116: ICNIRP Exposure Limits for General Public Exposure to Electric and Magnetic Fields 575

Table 117: Typical 60 Hz electric and magnetic field levels from overhead power lines 575

Table 118: Magnetic Field values for different OHTLs 576

ABBREVIATION AND ACRONYMS

Acronym	Definition
ADB	Asian Development Bank
ASSR	Autonomous Soviet Socialist Republic
ATKRIV	State Inspection for Control in the Field of Informatization and Telecommunication of
BESS	Battery Energy Storage System
BMP	Biodiversity Management Plan
CBD	Convention on Biological Diversity
CCRA	Climate Change Risk Assessment
CEDAW	Convention on the Elimination of All Forms of Discrimination Against Women
CHA	Critical Habitat Assessment
CITES	Convention on International Trade in Endangered Species of Wild Flora and Fauna
CMS	Convention on the Conservation of Migratory Species of Wild Animals
CRC	Convention on the Rights of the Child
CRM	Collision Risk Model
CRPD	Convention on the Rights of Persons with Disabilities
E&S	Environmental and Social
EBRD	European Bank for Reconstruction and Development
EHS	Environmental, Health & Safety
EHSS-MS	Environmental Health Safety and Social Management System
EIA	Environmental Impact Assessment
EP	Equator Principles
EPAP	Equator Principles Action Plan
EPC	Engineering, Procurement, and Construction
EPFIs	Equator Principle Financial Institutions
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
ESMS	Environmental and Social Management System
EU	European Union
FGD	Focus Group Discussion
GBVH	Gender-Based Violence and Harassment
GDP	Gross Domestic Product
GDP	Gross Domestic Product
GLVIA	Guidelines for Landscape and Visual Impact Assessment
GPN	Good Practice Note
IBA	Important Bird Areas
IFC	International Finance Corporation
IFIs	International Financial Institutions
ILO	International Labor Organization
IWGIA	International Work Group for Indigenous Affairs

KBA	Key Biodiversity Areas
LLA	Land Lease Agreement
LLC	Limited Liability Company
LoS	Line of Sight
MoU	Memorandum of Understanding
MoU	Memorandum of Understanding
MS	Management System
MV	Medium Voltage
MW	Mega Watt
MW	Megawatt
NGO	Non-Governmental Organization
NOx	Nitrogen Oxides
NPL	Noise Pressure Levels
NTS	Non-Technical Summary
O&M	Operation and Maintenance
OAE	International Fund for Houbara Conservation in Abu Dhabi
OHTL	Overhead Transmission Line
OVOS	Otsenka Vliyaniya na Okruzhayushchuyu Sredu
PM	Particulate Matter
POPs	Persistent Organic Pollutants
PPA	Power Purchase Agreement
PR	Performance Requirement
PS	Performance Standard
SCADA	Supervisory Control and Data Acquisition
SEP	Stakeholder Engagement Plan
SMP	Security Management Plan
SOx	Sulphur Oxide
SPS	Safeguard Policy Statement
SRA	Security Risk Assessment
SSW	South-southwest
STDs	Sexually Transmitted Diseases
SW	Southwest
TSP	Total Suspended Particulate
TV	Television
UN	United Nations
UNCCD	United Nations Convention to Combat Desertification
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
VP	Vantage Points
WTG	Wind Turbine Generator

WTGs	Wind Turbine Generators
ZTV	Zone of Theoretical Visibility

1. INTRODUCTION

1.1 Background

Uzbekistan is the region's third-largest gas producer, after Russia and Turkmenistan, due to its abundant natural gas reserves. Energy production and consumption contributes almost 20% of its Gross Domestic Product (GDP) and 15% of industrial output, and energy exports (primarily gas) were 17.3% of total commodity exports¹.

However, with that, in recent years, Uzbekistan has faced a severe energy crisis and is going through a power system collapse – particularly during winter. The problem has affected every part of society, from businesses and industry to residents' daily lives. In December 2022, extremely low temperatures created pressure drops in the gas pipelines, which in turn created a big national crisis given that 80% of Uzbekistan's electricity comes from thermal power facilities that run on gas. The crisis has resulted in severe power outages with nation-wide blackouts².

Acknowledging the severity of the situation, the Government of Uzbekistan has taken ambitious measures to alleviate the energy crisis. One of the first priorities was to reduce reliance and dependency on natural gas for electricity generation and promote renewable energy sources such as solar and wind power.

The Government issued a decree titled "Measures to Increase the Use of Renewable Energy Sources," which established a goal of raising the proportion of renewable energy in the country's entire energy mix to 25% by the year 2030.

In addition, the Government has implemented further actions to encourage investment and use of renewable energy, including the enactment of new regulations and legislation. The "Law on the Use of Renewable Energy Sources of 2017" provides a legal framework for development, use and promotion of renewable energy sources. Furthermore, the Resolution of the President of the Republic of Uzbekistan "Measures to Stimulate Investments in Renewable Energy" enacted in 2020 also aims to attract investments in the renewable energy sector by providing a range of financial incentives and support mechanisms.

In accordance with the above, ACWA Power (hereafter referred to as the '**Developer**') signed a Memorandum of Understanding (MoU) with the Ministry of Energy and the Ministry of Investments and Foreign Trade of the Republic of Uzbekistan to develop a 1,500 Mega Watt (MW) wind power project to be located in the Republic of Karakalpakstan (hereafter referred to as the '**Project**'). Following this, three (3) Power Purchase Agreements (PPAs) for 500 MW (for a total of 1,500MW) + 100 MW Battery Energy Storage Systems (BESS) have been signed.

1.2 The Environmental and Social Impact Assessment (ESIA) Report

ACWA Power appointed ECO Consult to prepare the Environmental and Social Impact Assessment (ESIA) for the Project. ECO Consult in turn subcontracted the following entities: (i) Green Business Innovation (GBI) (a locally registered Uzbekistani E&S consulting company); and (ii) Turnstone Ecology (an international consulting company specializing in ecological assessments and studies). ECO Consult, GBI and Turnstone are hereafter referred to as the '**E&S Team**'.

¹ [Uzbekistan energy profile – Analysis - IEA](#)

² [Executive summary – Uzbekistan 2022 – Analysis - IEA](#)

The Ministry of Ecology, Environmental Protection, and Climate Change serves as the primary environmental regulator in Uzbekistan, under which the Ministry is mandated in issuing environmental permits for development projects. In accordance with the "Resolution №541 of the Cabinet of Ministers on Procedure of EIA Mechanism (07 September 2020)", the Ministry requires for a project of this scale and nature to undertake an Environmental Impact Assessment³ (EIA) study in order to obtain an environmental permit. Within the local context, the EIA process is referred to as Otsenka Vliyaniya na Okruzhayushchuyu Sredu (OVOS).

In addition, the Project will be seeking financing from International Financing Institutions (IFIs). Therefore, the Developer wishes to design and manage the Project in accordance with international Environmental and Social (E&S) standards and requirements. For the purpose of the ESIA, this will be based on the following requirements:

- Equator Principles 4 (EP 4);
- European Bank for Reconstruction and Development (EBRD's) requirements to include EBRD's 2019 E&S Policy and Performance Requirements (PRs);
- International Finance Corporation's (IFC's) requirements to include IFC Policy on E&S Sustainability (2012), IFC Performance Standards (2012), and relevant IFC EHS Guidelines; and
- Asian Development Bank (ADB) requirements to include ADB's Safeguard Policy Statement (SPS) (2009), Social Protection Strategy (2001), Gender and Development Policy (1998) and Access to Information Policy (2018).

Therefore, the ESIA has been prepared to ensure that local OVOS requirements are met as well as international E&S standards and requirements.

1.3 Project Setup and Responsibilities

Different entities are involved in the planning and implementation of the Project. Responsibilities of each entity are listed in the text below along with a general description of their roles.

- ACWA Power: The owner and developer of the Project (hereafter referred to as 'the Developer');
- Ministry of Ecology, Environmental Protection, and Climate Change⁴: the official governmental entity responsible for protection of the environment in Uzbekistan. The Ministry is responsible for approval of the ESIA and making sure it complies with the local environmental legislations and granting the environmental clearance for the Project;
- International Financing Institutions (IFIs): entities that will provide financing to the Developer for the development of the Project. Such IFIs will ensure that the Project is developed in accordance with international E&S standards and requirements. At this stage, the IFIs will include Standard Chartered

³ within the local context, the requirement is to undertake an EIA, however as noted throughout the document an ESIA is being undertaken for the Project to meet international E&S standards and requirements. Therefore, throughout the document the term ESIA will be used.

⁴ A recent restructuring within governmental units in Uzbekistan occurred in June 2023 under which it was named as the Ministry of Ecology, Environmental Protection and Climate Change. In December 2022 it was called the Ministry of Natural Resources and prior to that it was known as the State Committee of the Republic of Uzbekistan for Ecology and Environment Protection.

(SC), International Finance Corporation (IFC), European Bank for Reconstruction and Development (EBRD) and Asian Development Bank (ADB).

- **Engineering, Procurement, and Construction (EPC) Contractor:** will be responsible for preparing the detailed design and layout of the Project; supply of the material and equipment (e.g. wind turbines); construction of the Project and its various components (turbines, internal roads, building infrastructure, etc.). The EPC Contractor for this Project has not been assigned yet;
- **Project Operator:** responsible for Operation and Maintenance (O&M) of the Project. The Project Operator has not been assigned at this stage;
- **JSC National Electric Grid of Uzbekistan:** will be the off taker of electricity and is the entity that signed the Power Purchase Agreement (PPA) with the Developer; and
- **E&S Team (ECO Consult, Green Business Innovation and Turnstone Ecology):** is the ESIA Practitioner and the consultant commissioned by ACWA Power to prepare the ESIA for the Project in accordance with local requirements as well as international E&S standards and requirements.

1.4 Document Structure

The following table provides an overview of the sections within this ESIA document. In addition, the ESIA includes a standalone Non-Technical Summary (NTS) and a Stakeholder Engagement Plan (SEP).

Table 1: Overall ESIA Structure

Chapter	Description of Content
Section 2 – Project Description	Provides a detailed description of the Project in relation to its location, the key project components and an overview of the proposed activities that are to take place during the various Project phases.
Section 3 – ESIA Approach and Methodology	Presents the methodology and approach that was adopted for the ESIA study.
Section 4 – Analysis of Alternatives	Investigates several alternatives to the Project development and the reasons for the preferred choice. This includes alternatives in relation to the Project site, selected technology, Project design, and finally investigates the ‘no action alternative’ – which assumes that the Project development does not take place.
Section 5 – Regulatory & Policy Framework	Provides an overview of the environmental and social regulatory and policy framework applicable to the Project.
Section 6 – Stakeholder Consultation and Engagement	Discusses in detail the stakeholder consultation and engagement plans which were undertaken as part of the ESIA process for the Project and provides an overview of the findings. In addition, this Chapter also discusses the future stakeholder engagement and consultation plans which are to take place at a later stage.
Section 7 – Overview of Strategic Environmental and Economic Impacts	Provides an overview of the significant positive environmental and economic impacts that will result from the Project development on the strategic and national level. The Section also highlights the site specific negative environmental and social impacts anticipated from the Project throughout its various phases – each of which is discussed in details in the subsequent chapters.
Section 8 – Section 17	These sections first present the baseline conditions within the Project site and surroundings, and then assess the anticipated impacts from the Project throughout its various phases on such a receptor. Finally, for each identified impact a set of mitigation and monitoring requirements have been identified which aim to eliminate the impact and/or reduce it to acceptable levels. This includes the following: Landscape and Visual (Section 8), Land Use (Section 9), Hydrology, Hydrogeology and Geology (Section 10), Biodiversity (Section 11), Archeology and Cultural

	Heritage (Chapter 12), Air Quality and Noise (Section 13), Infrastructure and Utilities (Section 14), Worker Welfare, Health and Safety (Section 15), Community Health, Safety and Security (Section 16), Socio-economics (Section 17).
Section 18 – Assessment of Cumulative Impacts	Investigates the cumulative impacts which could result from incremental impacts from other known existing and/or planned developments in the area based on currently available information.
Section 19 – Human Rights and Gender Assessment	Presents a standalone human rights and gender risk assessment for the Project.
Section 20 – Climate Change Risk Assessment	Presents a standalone climate change risk assessment for the Project.
Section 21 – Environmental and Social Management Plan (ESMP)	Presents the Environmental and Social Management Plan (ESMP) for the Project; which mainly summaries the impacts identified as well as the mitigation measures and monitoring requirements to be implemented throughout the various Project phases. In addition, this section describes the institutional framework and procedural arrangement for the ESMP implementation as well as the implementation of an Environment, Social, Health and Safety (ESHS) Management System.
Section 22 – Overhead Transmission Line (OHTL) Assessment	Presents the outcomes of E&S baseline studies undertaken to date for the OHTL. In addition, this section presents the key risks and impacts anticipated from the development of the OHTL required for the Project as well as the key mitigation and monitoring measures that will be implemented.

2. PROJECT DESCRIPTION

This section provides a detailed description of the Project in relation to its location, the key project components, and an overview of the proposed activities that are to take place during the construction, operation, and decommissioning phase.

2.1 Project Location

It is important to understand the administrative setup of Uzbekistan as several terminologies related to this will be referenced throughout the ESIA report.

Administratively, Uzbekistan is divided into 12 Regions (also known as *viloyatlar*), 1 sovereign republic (known as the Sovereign Republic of Karakalpakstan), and 1 independent city (which includes Tashkent as the capital of Uzbekistan).

The Project site is located within the Sovereign Republic of Karakalpakstan. The Republic occupies the whole northwestern part of Uzbekistan. The capital of the Republic is Nukus. Under Soviet rule, it was an autonomous area within the Russian Soviet Federative Socialist Republic before becoming part of Uzbekistan in 1936 as the Karakalpak ASSR. The Republic of Karakalpakstan maintained its predecessor's formal sovereignty, even after the independence of Uzbekistan in 1990.

Table 2: Region Divisions of Uzbekistan

Division	Legend	Division	Legend	Division	Legend
Andijan Region	2	Qashqadaryo Region	8	Khorazm Region	13
Bukhara Region	3	Samarqand Region	9	Namangan Region	6
Fergana Region	4	Sirdaryo Region	10	Navoiy Region	7
Jizzakh Region	5	Surxondaryo Region	11	Tashkent Region	12
Karakalpakstan	14	Tashkent	1		

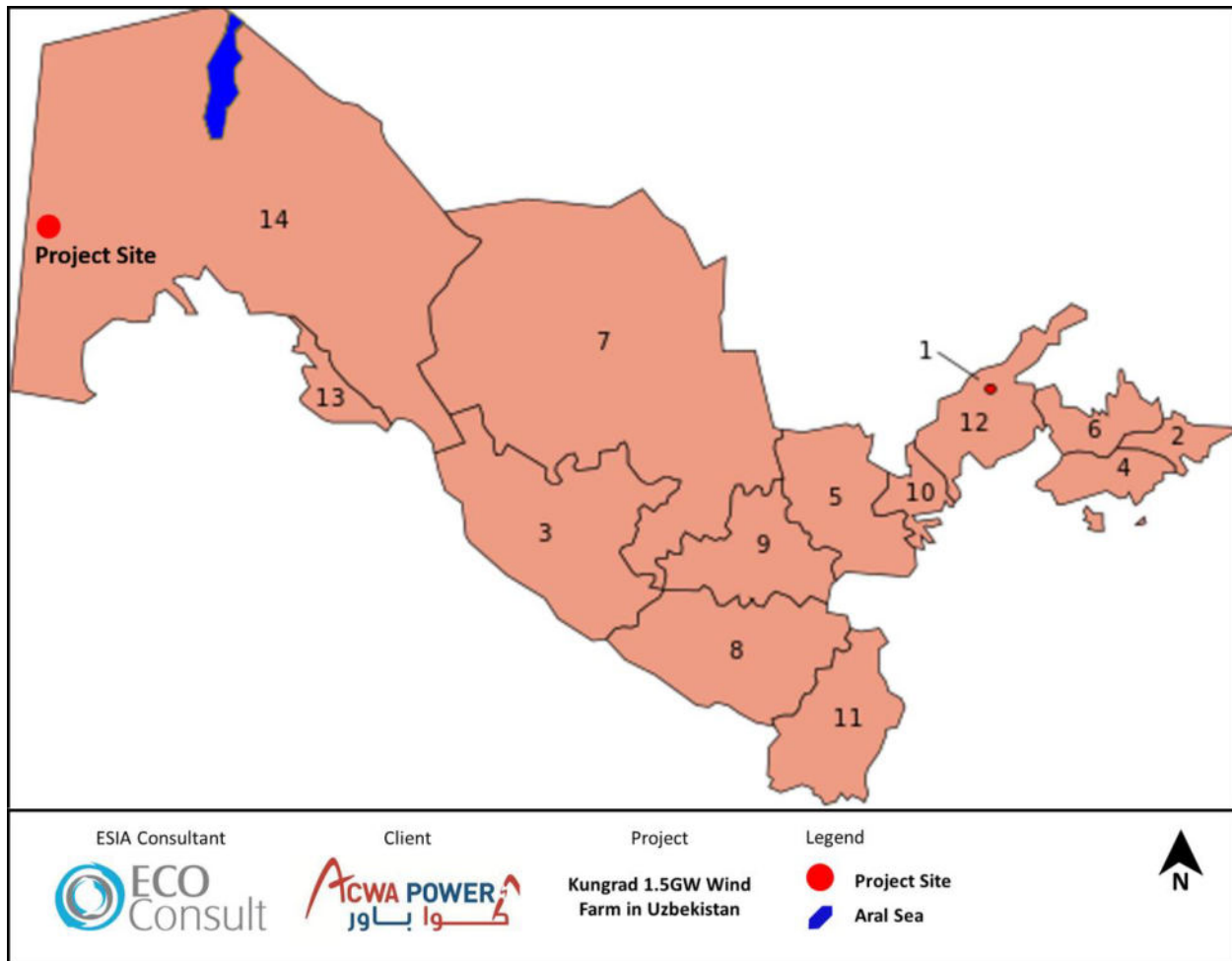


Figure 1: Region Division of Uzbekistan

The administrative setup of Karakalpakstan includes multiple levels of governance to ensure effective management and service provision within the region. At the highest level, Karakalpakstan is led by the **Supreme Council** (known as *Jokori Kenes*), which acts as the legislative body representing the interests of the population. The republic has its own constitution but follows all legislations as that of Government of Uzbekistan. However, it shares veto power with Uzbekistan over decisions concerning its affairs.

The Supreme Council Chairman is the head of the Government including the Council of Ministers. All ministries within Uzbekistan are also present in Karakalpakstan. For example, there is a Ministry of Ecology, Environmental Protection, and Climate Change in Tashkent, and a Ministry of Ecology, Environmental Protection, and Climate Change for the Republic of Karakalpakstan.

Administratively, Karakalpakstan is divided into 16 Districts (known as *Rayons*). Each District has its own local administration (known as *Khokimiyat*) led by the *Hokim* (equivalent to a Governor). The *Khokimiyat* is responsible for the local governance, development, and implementation of government programs and initiatives at the district level. They are also responsible for municipal services such as water supply, waste management and other.

The Project site is located within Kungrad District, approximately 225km west of Karakalpakstan's capital city of Nukus and 150km west of the District's capital (Kungrad City).

Table 3: District Divisions of Karakalpakstan

Division	Capital	Legend	Division	Capital	Legend
Amudaryo District	Mang'it	2	Qanliko'l District	Qanliko'l	5
Beruniy District	Beruniy	3	Kungrad District	Kungrad	8
Chimboy District	Chimboy	15	Qorao'zak District	Qorao'zak	6
Ellikqala District	Bo'ston	17	Shumanay District	Shumanay	16
Kegeyli District	Kegeyli	7	Taxtako'pir District	Taxtako'pir	12
Mo'ynoq District	Mo'ynoq	9	To'rtko'l District	To'rtko'l	13
Nukus District	Oqmang'it	10	Xo'jayli District	Xo'jayli	14
Taxiatosh District	Taxiatosh	11	Bo'zatov District	Bo'zatov	4

The smallest administrative division in Uzbekistan as well as Karakalpakstan is known as the **Mahalla**. It could include one (1) or more cities, towns, neighborhoods, and villages. The Mahallas have the following roles and responsibilities: (i) act as the community unit and governance institutions within these cities, towns, neighborhoods and villages; (ii) help facilitate local governance and service delivery to the residents; (iii) act as a coordination point with community; (iv) focal point for information sharing; (v) implement government programs and other.

The Mahalla is headed by a Chair who is elected by local communities. In addition, each Mahalla includes a Mahalla Committee composed of 3-4 people that are appointed formally by the government (this always includes at least one (1) woman that would be responsible for women and youth affairs). In addition, informally, the Committee also includes the participation of elderly and community leaders.

Kungrad District includes the following community settlements:

- One (1) city known as Kungrad (capital city of the district) which serves as an important urban center;
- Four (4) towns that include Jasliq, Kirkkiz, Elobod, and Karakalpakiya; and
- Seven (7) rural communities comprising various villages and settlements.

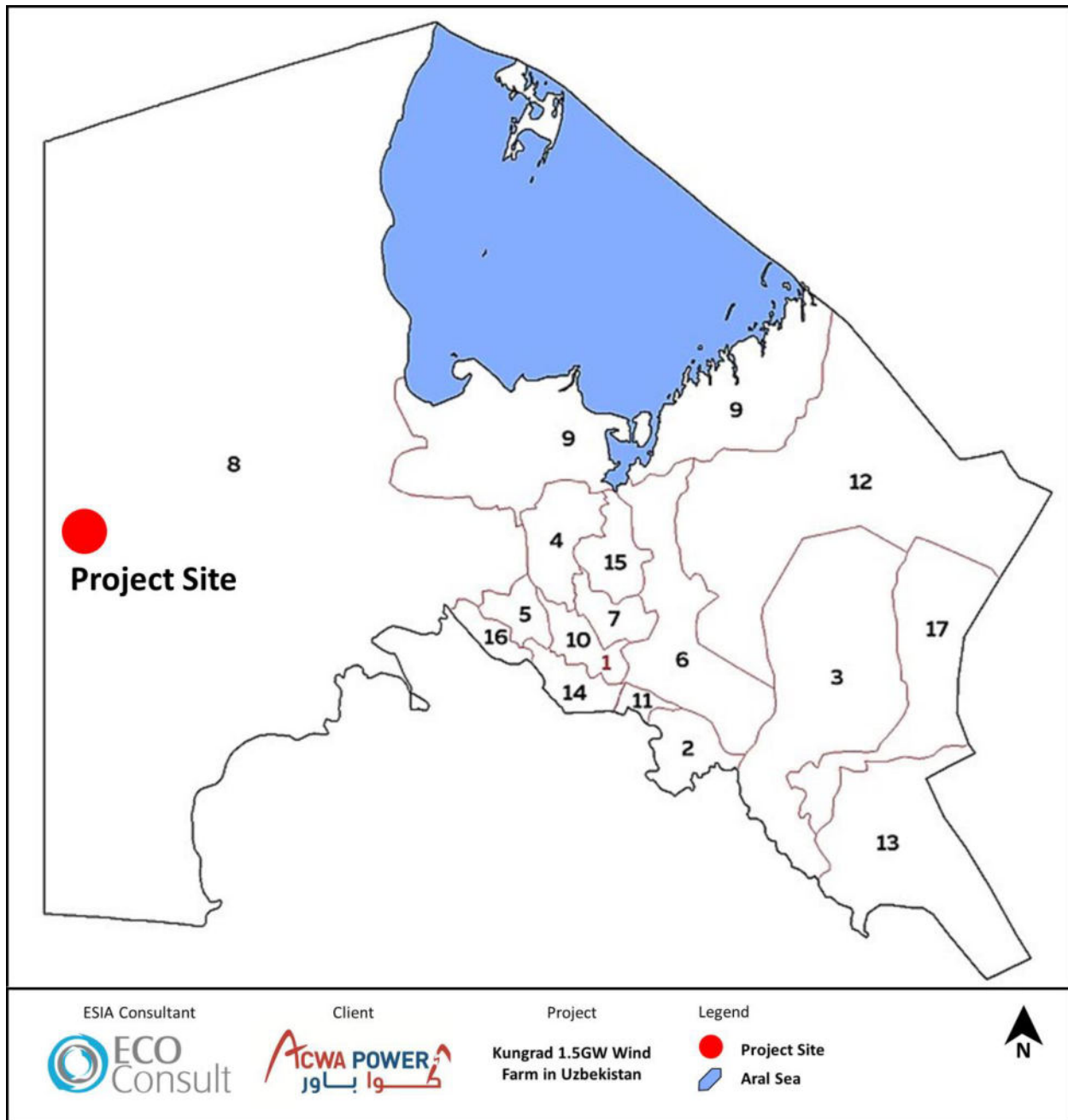


Figure 2: District Divisions in Karakalpakstan

2.2 Local Communities

Throughout the ESIA report, the term local communities will be used. This will refer to the following settlements and inhabited areas in particular:

- Kirkkiz town located around 110km to the east of the Project site;
- Elobod town located around 120km to the east of the Project site;
- Jasliq town located around 115km to the north of the Project site; and

- Kungrad City Center located around 150km to the east of the Project site.

The above communities have been selected as affected communities based on the following rationale:

- Administrative Setup: the Project site as explained earlier is located entirely within Kungrad District. The next closest District (Mo'ynoq District) is located more than 150km away from the Project site. Therefore, priority was for selection of villages/cities located within Kungrad District itself.
- Proximity to Site: the closest settlements were considered as local communities. Although at a considerable distance from the Project site, these are the communities that are most likely to be impacted (positivity or negatively) in some way, as explained in details throughout the ESIA.

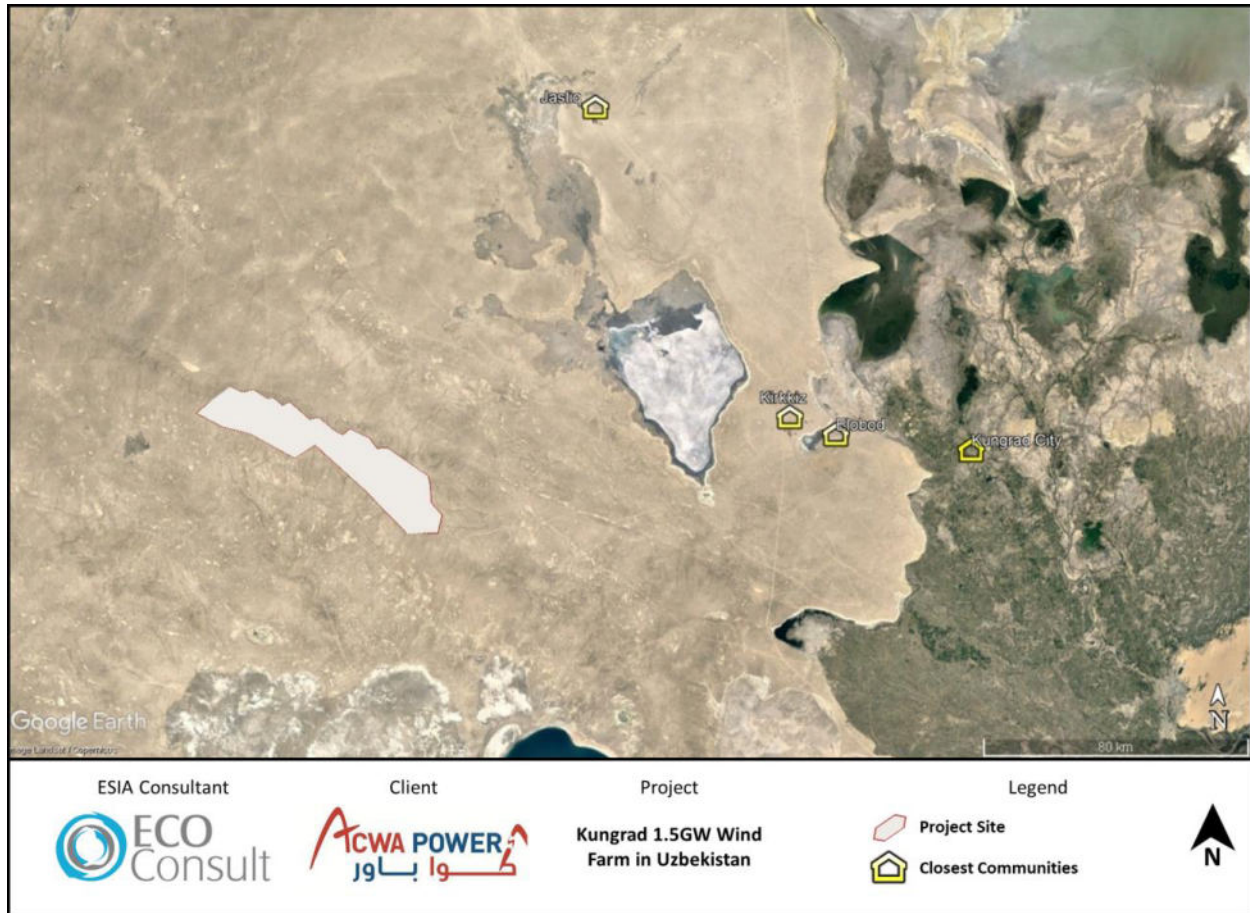


Figure 3: Project Site and Closest Communities

2.3 Project Components

2.3.1 Outline of Wind Energy Technology

Wind turbines convert kinetic energy from the wind that occurs naturally in the earth’s atmosphere into electrical energy. Wind’s kinetic energy is converted to rotational energy with the turbine’s rotor. This rotational energy is then, inside the wind turbine, transferred to the gearbox to adjust its rotational speed, before it is transformed into electrical energy with the generator. After some rectifications through converter, transformers and substations the electricity is delivered to transmission and distribution systems and then to the end user.

The figure below presents the key components of a wind farm each of which is discussed in further details throughout the subsequent sections.

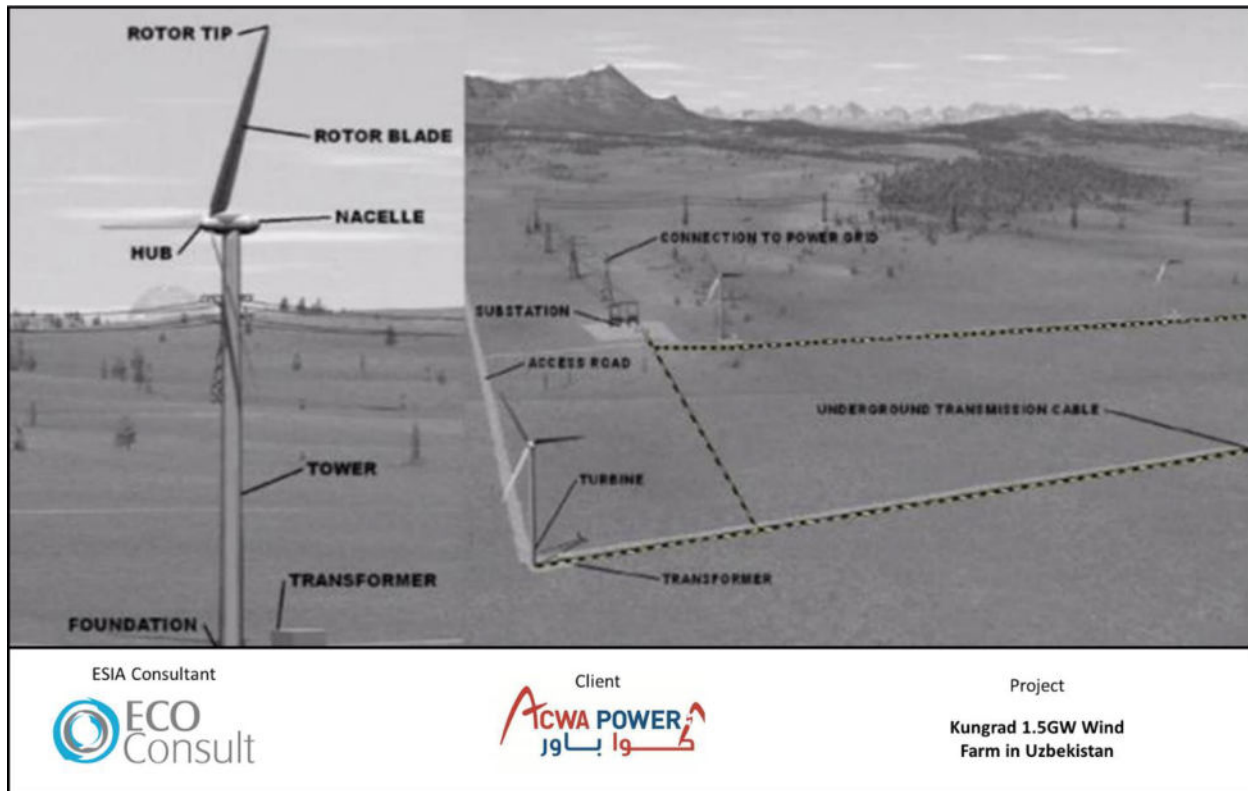


Figure 4: Typical Structural Components of a Wind Turbine and Wind Farm
(Source: EHS Guidelines for Wind Energy, IFC)

2.3.2 Wind Turbine Generators (WTG)

Generally, a WTG consists of a foundation, tower, nacelle, rotor blades, a rotor hub, and a transformer (refer to figure above).

Foundations will be constructed to bolt the tower of the WTG in place (one for each WTG); where in general each foundation consists of a circular footing of around 20m diameter, with a depth of 3m to 4m and an elevation of 1m. The foundation will be built with concrete reinforced with structural corrugated steel. *Note: based on initial information from geotechnical investigations, it is unlikely that blasting activities will be required for WTG foundations – this is to be verified by the EPC Contractor once appointed.*

The WTG contains the electrical conduits, supports the nacelle, and provides access to the nacelle for maintenance. Typically, three (3) blades are connected to the hub which then connects with the nacelle; the box-like component that sits atop the tower and which most importantly contains the gear box (which steps up the revolutions per minute to a speed suitable for the electrical generator) and the generator (which converts the kinetic energy into electricity).

In addition, each WTG is equipped with a transformer that converts/steps up the output from the turbine to a higher voltage (from 0.61/1.1kV to 22kV or 33kV) to meet a specific utility voltage distribution level that is appropriate for connection with a substation (explained in detail below).

Finally, next to each WTG will be a crane pad to accommodate cranes for the installation of the turbines and for maintenance activities during operation. The crane pads will be suitable to support loads required for the erection, assembly an operation and maintenance of the turbines. Generally, crane pads have an area of around 1,500m².

The Developer is currently undergoing a selection process for the EPC Contractor who will be supplying the WTGs and preparing the detailed design of the Project. Currently, there are six (6) options that are being considered at this point. ***Note: this is based on currently available information and could be subject to change at a later stage. For the remainder of the ESIA, the worst-case turbine specifications have been considered in order to present the worst-case assessment in relation to the ESIA. The worst-case WTG specifications are presented in the table below along with the worst-case layout.***

Table 4: Worst-Case WTG Specifications

Item	Specification
Rotor Diameter (m)	204
Hub Height (m)	130
Tip height (m)	232
Number of turbines	260. <i>However, in reality it is highly likely that only 188 to 201 WTGs will be required however again to account for a worst-case 260 is considered</i>
Capacity per turbine (MW)	7.7 - 8
Area Swept by rotors (m ²)	32,685

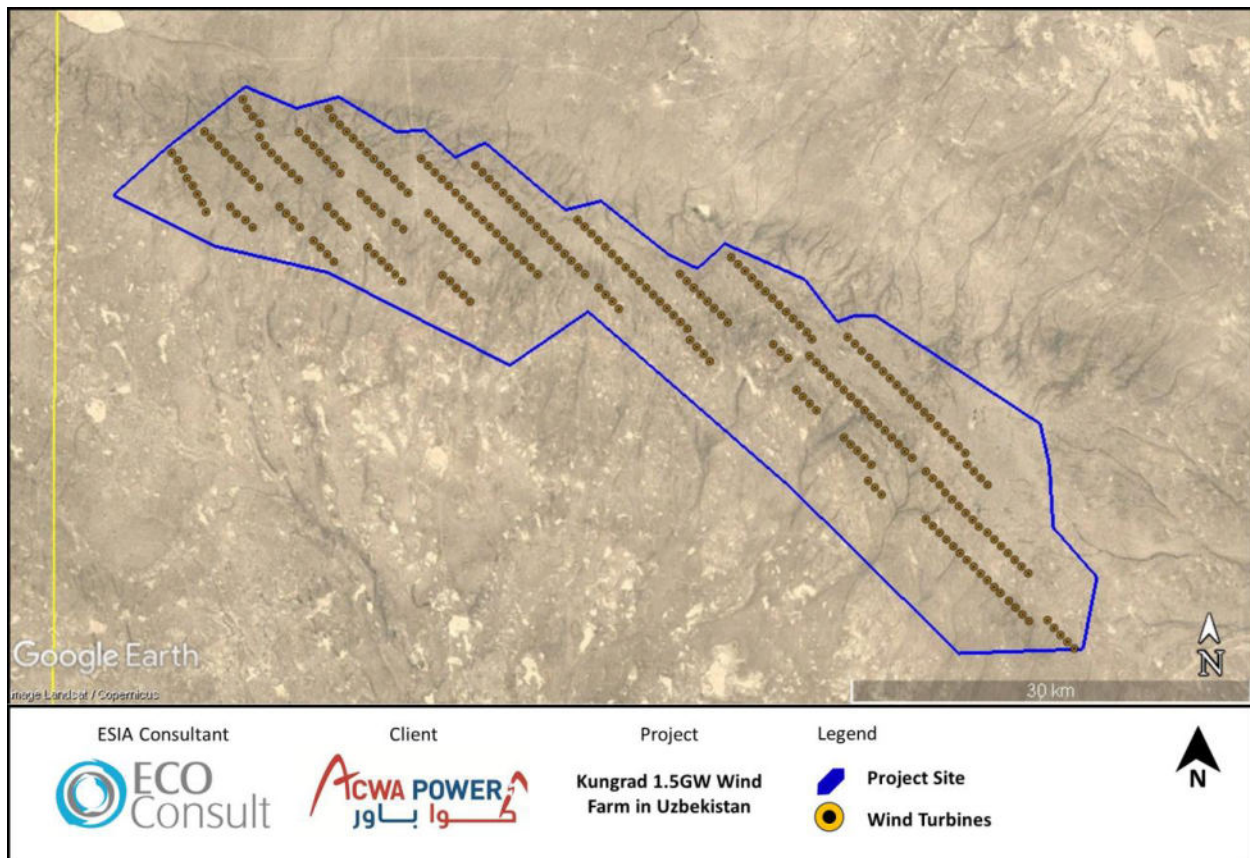


Figure 5: Preliminary WTG Layout

2.3.3 Infrastructure and Utilities

The following highlights the key infrastructure and utility elements that will be required for the Project.

- Medium Voltage (MV) Cables: The wind turbines will be connected through medium voltage cables (33kV or 35kV) to an onsite substation (discussed below). The connection between the turbines and the substation will be made using underground transmission cables buried in ground by trenches.
- Communications Network: The Project will have a Supervisory Control and Data Acquisition (SCADA) system for the remote operation of the facilities. A communication network will be installed which will consist of fiber optic cables connecting the turbines together to the SCADA system at substation. The communication system will be installed in the same trenches as the MV cables discussed above.
- Substation: The substation is a high voltage transformer unit that collects and converts the output from the turbines to a higher voltage (from 33kV or 35 kV to 500 kV) that is appropriate for connection with the High Voltage National Grid (500 kV).

There will be three (3) substations within the Project area – one for each 500MW capacity. The location of the substations is presented in the figure below.

- Building Infrastructure: Onsite building infrastructure will be required for the daily operation of the Project. Such buildings could include an administrative building (offices) used for normal daily operational related work, control room, workshop and a warehouse for storage of equipment and machinery such as spare parts, oil cartridges, fuel, lubricants, etc.;

There will be three (3) building infrastructure areas – one next to each substation. The location of the building infrastructure elements is presented in the figure below.

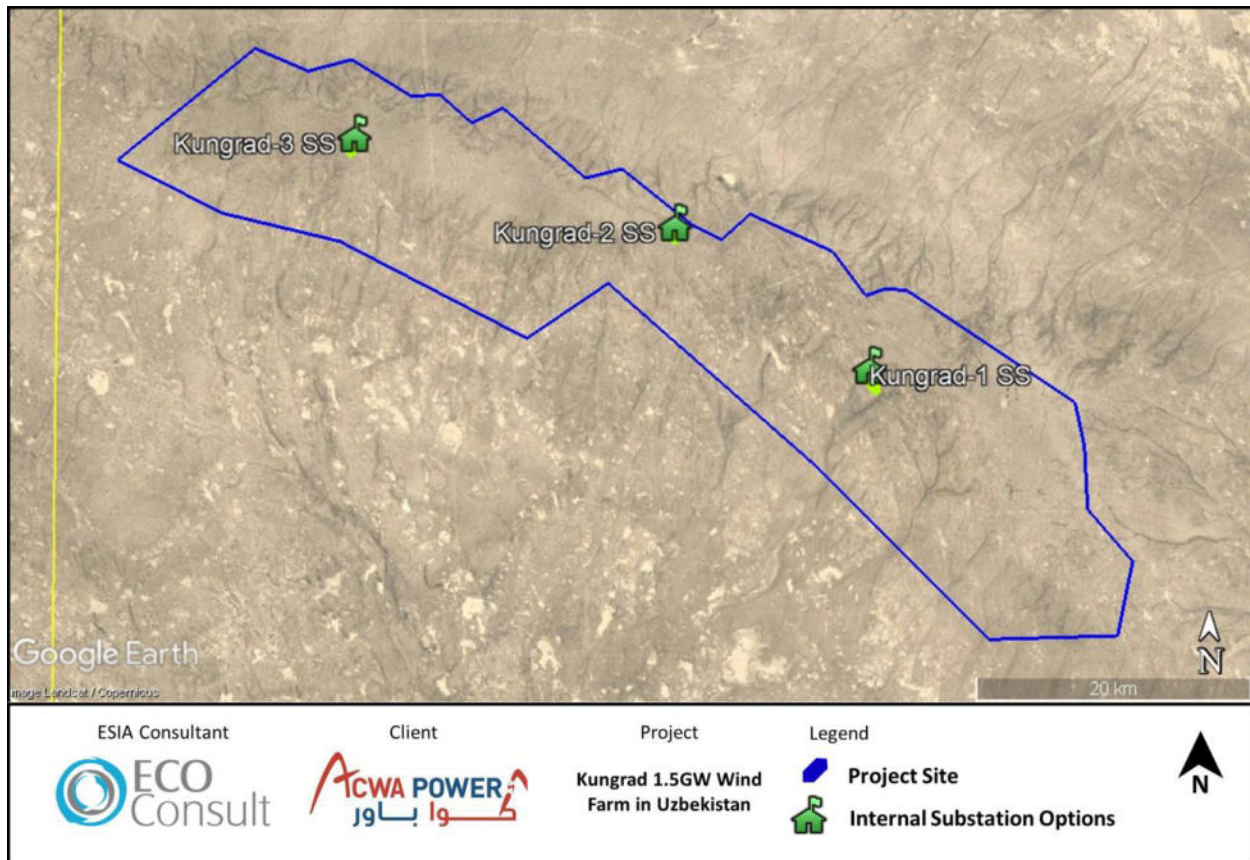


Figure 6: Internal Substation Options



Figure 7: Typical Substation

- **Road network:** An internal road network will be required within the Project site for installation of the turbines during the construction process and for ease of access to the turbines for maintenance

purposes during operation. The internal road network followed to the greatest extent possible the existing track and dirt roads within the Project site (this issue is discussed in further details in “Section 4.3”). The figure below presents the layout of the internal road network.

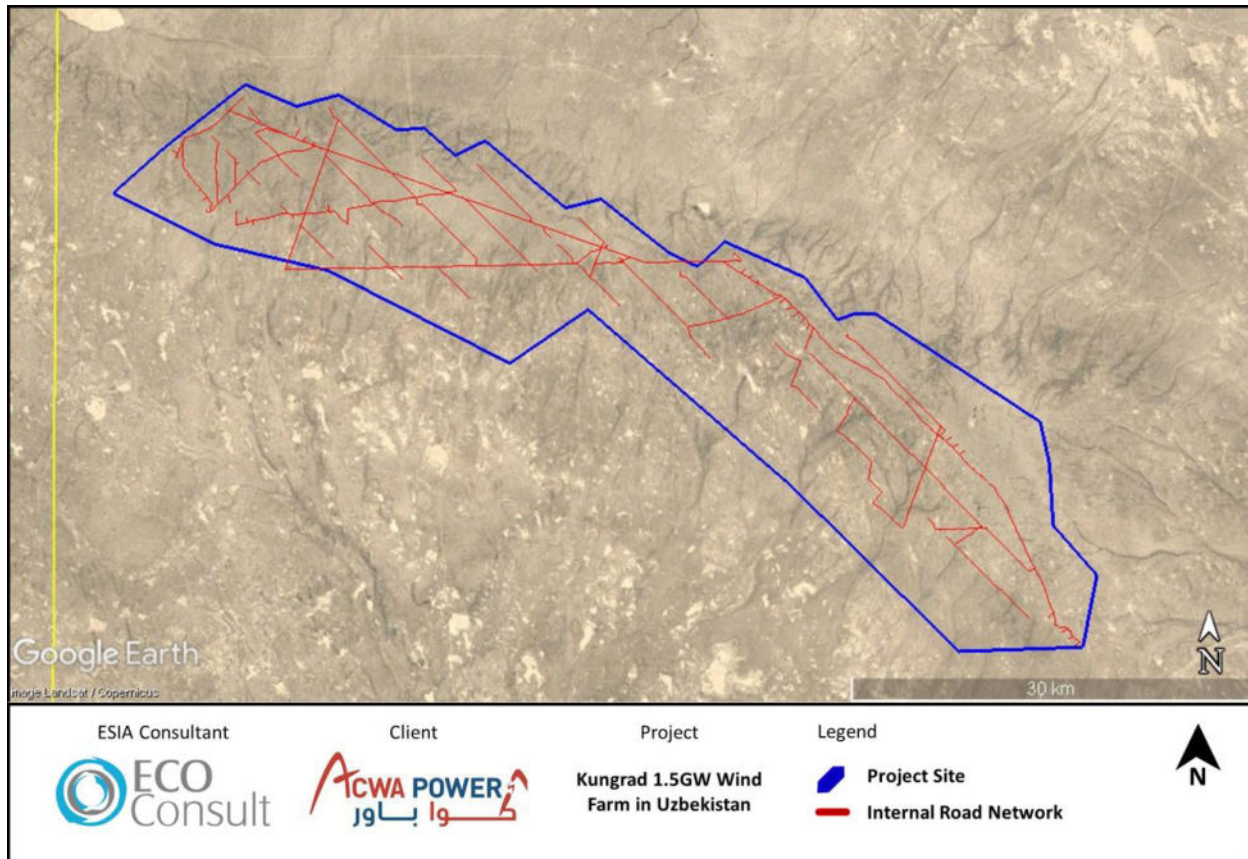


Figure 8: Map of Internal Roads

2.3.4 BESS

As mentioned earlier, there will be three (3) substations located onsite – one for each 500MW capacity. Located next to each substation, a 100 MW Battery Energy Storage Systems (BESS) will be installed that will be connected to the substation through a 33kV MV collector bus. The figure below presents a typical BESS. Based on preliminary information available at this stage, the technology will be Lithium Ion. The BESS will be used to store excess energy from the Wind Project and to control the ramp rate.

2.3.5 Access Road

Due to the remoteness of the site, an access road will be required to connect the Project from the nearest highway available. Such access road will be required for delivery of WTGs to the site as well as other equipment and machinery, as well as transportation of workers and other personnel.

The access road starts from the main highway running with Kungrad District passing near Kirkkiz and Kunkhodja village (known as Highway A380). From there the access road runs all the way to the southern parts of the Project site where it will connect with the internal road network (discussed earlier under the section above). The total length of the access road is around 100km. In general, the access roads follow an existing dirt road running from the main Highway to the Project site.

The figure below presents the access road.



Figure 9: Typical BESS



Figure 10: Access Road

2.3.6 Other Temporary Components

There are additional Project components that will be required on a temporary basis throughout the construction phase of the Project in particular. Those are identified below. The location of such components in particular will not be available at this point, nor is it expected to be available during the ESIA preparation phase. Those will be identified once the EPC Contractor is appointed and a detailed design is completed.

- Site Offices: temporary offices that will be used by Developer and EPC Contractor staff during the construction phase. It is expected that this will be within the Project footprint.
- Laydown areas: this is a temporary storage area where tools, materials, equipment and vehicles are stored when not in use. It is expected that this will be within the Project footprint.
- Batching Plant: a mobile concrete batching plant will be established within the Project footprint for preparation of the concrete to be used for foundation installation and other infrastructure requirements (e.g. substation, buildings, etc.). This will reduce transportation requirements compared to an off-site plant which is considered of significance importance given the remoteness of the site. A typical batching plant is provided in the figure below.
- Borrow Pits: borrow pits are used to provide fill materials such as gravel, sand, clay for various construction requirements such as base for road networks, foundations for WTGs, and other. A typical borrow pit is provided in the figure below.
- Worker Camp Area: due to the remoteness of the site, it is highly likely that Developer and EPC Contractor will establish a worker camp onsite for housing of various workers involved in the construction phase of the Project.
- Generators: generators will be used for supply of electricity throughout the construction phase of the Project for various power supply requirements.

“Section 22.3” provides additional E&S requirements for temporary components to be considered by the EPC Contractor when planning for such components.



Figure 11: Typical Mobile Batching Plant



Figure 12: Typical Borrow Pit

2.3.7 Associated Facilities

Associated facilities are facilities that would not have been constructed or expanded if the Project did not exist and without which the Project would not be viable. For the purpose of this Project, the key associated facility is the Overhead Transmission Line (OHTL) that will connect from the three (3) Project substations to the national grid in order to supply electricity to end users.

The OHTL for this Project will be a high voltage line (500kV) that will run for around 800km. The OHTL will run from the Project site up until the Bukhara Region connecting with the national grid at various areas along the way through three (3) substations.

The detailed description of the OHTL along with an E&S assessment is presented in a standalone section. Please refer to “Section 23”. As described in further details in “Section 23”, the same EPC Contractor for the Project will also be responsible for constructing the OHTL.

2.3.8 Project Footprint

This section provides an estimate on the footprint of the Project taking into account the components discussed in the previous section and based on assumptions made by the ‘E&S Team’ to determine footprint values.

As noted in the table below, the total area of disturbance for the Project is significantly small, calculated at less than 1% of the total boundary of the Project area.

Table 5: Footprint of the Project Components

Component	Footprint	Description
Turbines	0.48km ²	This includes the footprint for the foundation and the crane pad area for each of the 260 turbines. Typically, each crane pad is around 1,500m ² in area, whereas each foundation typically consists of a circular footing of 20m diameter
Substation and Warehouse and Storage Facilities	0.9km ²	Footprint for each substation, warehouse, building facilities and BESS component is around 0.3km ² . The Project has 3 internal substations.
Trenches for MV cables and communication cables	2.4km ²	This includes trenches with a calculated length of around 400km and a width of 6m.
Road Networks	2.4km ²	This includes the road network with a total length of 400km and a width of 6m.
Total Project Footprint	6.2km ²	
Total Project Site Boundary Area	950 km²	Project footprint is around 0.6% of the total boundary of the Project area

2.4 Overview of Project Phases

This section presents the likely activities to take place during the Project development and which will include three distinct phases: (i) planning and design, (ii) construction, (iii) operation, and (iv) decommissioning. Each of which is summarized below.

2.4.1 Planning and Design Phase

This phase will involve the following;

- Completion of all required studies for the Project development. This will include but not limited to ESIA, topography study, geotechnical study, etc.;
- Obtaining and finalizing required financing from IFIs;

- Obtaining required permits;
- Appointment of EPC Contractor; and
- Preparation of detailed design and layout requirements.

2.4.2 Construction Phase

The typical activities that will take place during the construction phase for wind farms include the following:

- Mobilization of Project team and equipment to the site and recruitment of workers;
- Undertake mobilization works for temporary facilities which will involve deployment of site offices, worker camp, worker facilities, laydown areas and batching plant;
- Transportation of wind turbine components to the Project site. The components are expected to be transported to the closest marine port and then transported by road to the Project site;
- Site preparation of the turbine foundation. Such activities are limited to relatively small individual footprints of the foundations and will include excavations and land clearing activities and cement works for bolting of the tower to the foundation;
- Installation of turbine components to include tower assembly, hub, rotor, and nacelle lift and rotor assembly which most likely will occur through onsite mobile cranes;
- Civil works for construction and development of the access road and internal road network;
- Installation of underground cables and SCADA system;
- Construction works to include civil works, electrical works and mechanical works for the development of the substation and building infrastructure, etc.; and
- Decommissioning of temporary facilities

2.4.3 Operation Phase

Wind farm projects generally require limited operational activities as this mainly includes the following:

- Commissioning tests of the wind farm which usually involves standard electrical tests for the electrical infrastructure as well as the turbine, and inspection of routine civil engineering quality records. Careful testing at this stage is vital if a good quality wind farm is to be delivered and maintained;
- Normal daily operation of the wind farm. The long-term availability of a commercial wind turbine is usually in excess of 97 percent (i.e. 97% of the time, the turbine will be available to work); and
- Maintenance will also take place through a dedicated team. Typical routine maintenance time for a modern wind turbine is 40 hours per year. Non-routine maintenance may be of a similar order. Although minimal, maintenance activities may include turbine and rotor maintenance, lubrication of parts, washing of blades, maintenance of electrical components, full generator overhaul, etc.

2.4.4 Decommissioning Phase

According to the PPA agreement, the Project is expected to be operational for 25 years. In the case of complete decommissioning of a wind turbine, the tower and blades of the removed wind turbine will be taken down by crane, disassembled into components, and then the turbine will be refurbished at source and used elsewhere for another Project or sent for final disposal. The base will typically be left in place and covered by gravel and peat or loam. Internal road networks and access roads are typically kept in place. Gates and fences (e.g. substation area and onsite offices) will be removed.

2.5 Project Schedule

Discussed below is the preliminary and tentative schedule for the overall Project development that is available at this point, as provided by the Developer.

- Planning and Design phase: This phase is ongoing and is expected to be completed by Q4 2024
- Construction phase: This will involve undertaking of all construction activities as identified earlier for the Project development. This is expected to require 42 months starting from Q4 2024.
- Operation phase: is expected to start in Q2 2028 for the duration of the PPA which is as discussed earlier set for 25 years.

It is important to note that there will be a phased approach to the overall development process of the Project. The first turbines are expected to be commissioned and operated by June 2027 and last turbines are expected to be commissioned and operated by April 2028 (i.e. 42 months from Q4 2024 as per timeline above). However, it is important to note that the final and detailed project schedule is currently being developed and will be agreed with EPC Contractor.

2.6 Workforce Requirements

According to information provided by the Developer, the Project will require the following workforce throughout the construction and operation phase:

- Around 2,250 job opportunity at peak during the construction phase for a duration of approximately 42 months. This will mainly include skilled job opportunities (to include engineers, technicians, consultants, surveyors, etc.) and semi-skilled and unskilled job opportunities (such as laborers, security personnel, housekeeping, etc.).
- Around 80 job opportunities during the operation phase for a duration of 25 years. This will include skilled job opportunities (such as engineers, technicians, administrative employees, etc.) and unskilled job opportunities (such as security personnel, drivers, etc.).

Taking the above into account, the Developer is aiming to hire local community members to the greatest extent possible throughout the construction and operation phase for skilled and unskilled jobs. The Developer is committed to adhering to transparent recruitment procedures which includes local community members.

3. ESIA APPROACH AND METHODOLOGY

This section presents the overall approach and methodology that was followed throughout the ESIA process for the Project.

3.1 Analysis of Alternatives

The "Resolution №541 of the Cabinet of Ministers on Procedure of EIA Mechanism (07 September 2020)" requires that the ESIA identify and analyze alternatives and present the main reason for the preferred choice. The examination of alternatives is also considered to be a key element of the ESIA process under all international E&S standards and requirements as well.

The analysis of alternatives is presented in "Section 4". The section discusses and compares several alternatives to the Project development in relation to: (i) the Project site, (ii) the chosen technology, (iii) the Project design, and finally investigated the 'no action alternative' - which assumes that the Project development does not take place.

3.2 Stakeholder Consultations and Engagement

Stakeholder consultation and engagement is an essential part of the ESIA process and has been carried out in accordance with the regulatory requirements in Uzbekistan and the international E&S standards and requirements. The previous and future stakeholder consultation and engagement for the Project are summarized below and discussed in detail in "Section 6".

The Project to date has included extensive stakeholder consultation and engagement with various stakeholder groups such as national governmental entities, regional and local governmental entities, Non-Governmental Organizations (NGOs), local communities, and other as appropriate. This has been undertaken through bi-lateral meetings, Focus Group Discussions (FGD), e-mail communication, phone communication, formal letters, and other.

"Section 6" also discusses future stakeholder engagement and consultations which are to take place at a later stage. This mainly includes: (i) public disclosure session with stakeholders to present the findings and recommendations proposed within the ESIA; and (ii) implementation of the Stakeholder Engagement Plan (SEP) by the Developer which describes the planned stakeholder consultation activities and engagement process' to take place after the ESIA approval.

3.3 Delineation of Study Boundaries and Scope Assessment

3.3.1 Definition of Spatial Study Area or Area of Influence (Aoi)

The overall study area (or Aoi) for the ESIA represents the potential Area of Influence (Aoi) of the Project. This is 'the area over which significant effects of the Project could reasonably occur, either on their own, or in combination with those of other developments and projects'.

In general terms, the study area for the Project ESIA includes the footprint of Project disturbance as demarcated in blue in the figure below. This includes the Wind Farm Project Site with a total area of 950 km².

However, for certain E&S parameters (such as landscape and visual, socio-economics, etc.), the study area goes beyond the actual footprint of the Project site, and therefore an appropriate thematic study area is determined for each theme on a case-by-case basis. Such a thematic study area is clearly identified within the relevant section it relates to throughout this ESIA.

In identifying this thematic study area, the type and degree of the potential direct and indirect effects were taken into consideration. The core area where direct effects are likely to occur was determined, as well as the wider area of influence where indirect, combined and cumulative effects are likely to occur on the surrounding areas and communities.

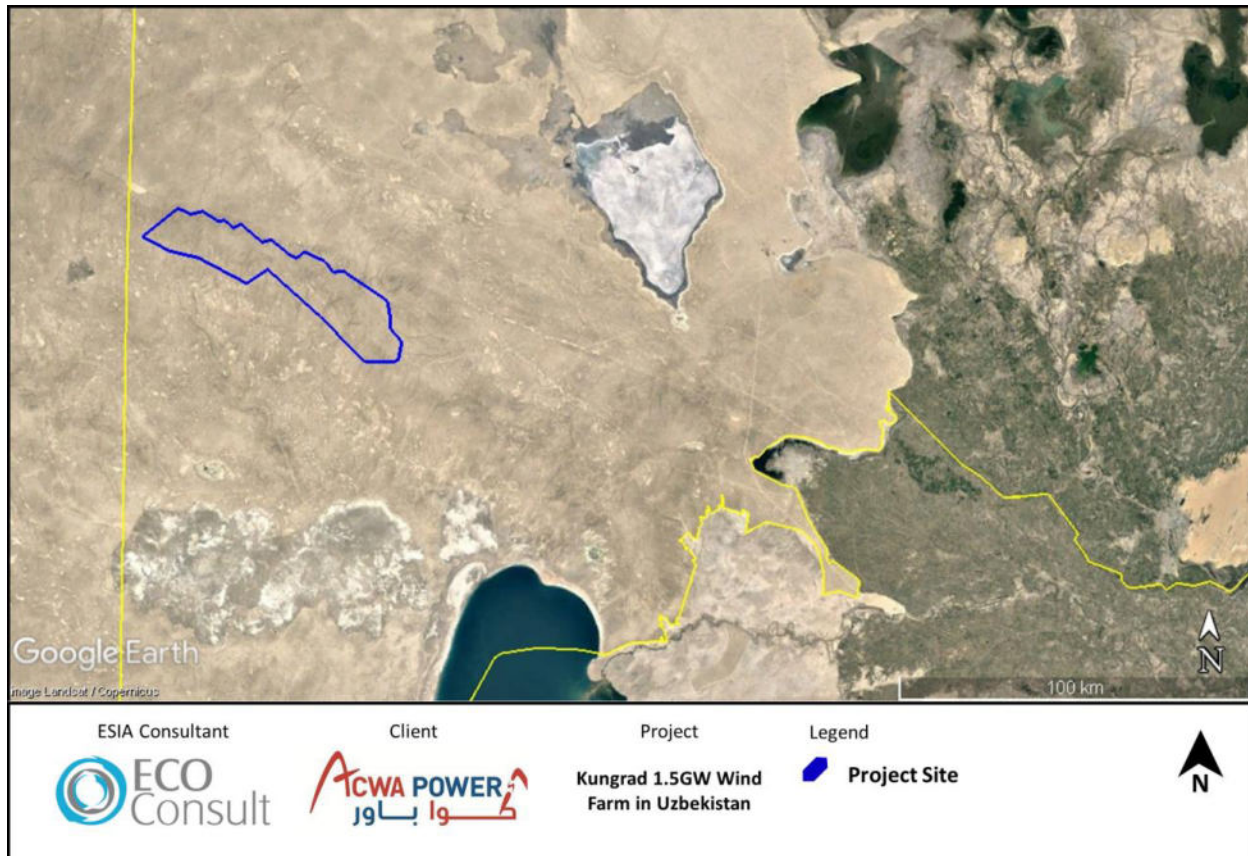


Figure 13: Study Area

3.3.2 Temporal Scope of the Assessment

The Project will be developed in a four-phase sequence as follows. The potential impacts are assessed throughout the various Project phases.

- Planning and Construction Phase;
- Operation Phase; and
- Decommissioning Phase.

(i) Planning and Construction Phase

This includes onsite construction activities which will be undertaken by the EPC Contractors under the guidance of the Developer. This mainly includes preparing the detailed design and layout of the turbines,

transportation of Project components onsite, construction of the substation, as well as onsite site preparation and construction activities for installation of wind turbines.

(ii) Operation Phase

This includes activities to be undertaken by the Project Operator. Activities expected to take place mainly include the normal daily operation of the Project and the routine maintenance activities.

(iii) Decommissioning Phase

Generally, the anticipated impacts throughout the decommissioning phase are similar in nature to impacts assessed during the construction phase – and specifically in impacts related to soil and groundwater (from improper management of waste streams), air quality and noise, and occupational health and safety. Therefore, the assessment of impacts for those receptors and mitigation identified during the construction phase is assumed to apply to this phase in particular without the need to reiterate or emphasize this throughout subsequent chapters.

3.3.3 Environmental and Social Baseline Conditions

As part of the ESIA process, the baseline environmental and social conditions of the study area were established. Describing the baseline includes identifying and defining the importance and sensitivity of the various environmental and social resources and receptors likely to be impacted, i.e. within the study area. Understanding the value or sensitivity of the resources and receptors to impacts and changes is an important consideration when determining the significance of effects, and allows for better identification of the most appropriate measures that could be employed to avoid impacts, and to mitigate any adverse impacts.

The description of environmental and social baseline conditions has considered a wide range of data and information gathered from various sources, including:

- Desk-based studies and literature reviews;
- Data from statutory and non-statutory stakeholders; and
- Field surveys and site investigations.

These studies have covered all the environmental and social aspects related to the Project. The baseline conditions are treated as those conditions which would prevail in the absence of the Project.

Studies of the environment and social baseline are described in “Section 8” – “Section 17” to include the following: landscape and visual; land use; geology/hydrology/hydrogeology; biodiversity; archaeology and cultural heritage; air quality and noise; infrastructure and utilities; and socio-economic conditions. Within each section, the methodology which was undertaken for assessment of the each of those baseline conditions is described in detail. This also included accounting for seasonal factors for biodiversity, avifauna, and bats – refer to each section for additional details on timing of surveys undertaken.

3.4 Impacts Assessment Methodology

Given the scale and type of the Project, the ESIA commences with an assessment of the positive environmental and economic impacts on the strategic and national level given the current challenges the energy sector in Uzbekistan faces – as highlighted in “Section 7.4”.

It then moves forward into the main body of the ESIA undertaking the assessment of impacts on environmental and social parameters for each receptor under the relevant chapter, from “Section 8” – “Section 17”. The following section provides a description of the approach, methodology and process adopted for the impact assessment presented within this ESIA.

3.4.1 Approach to Assessment of Impacts

The adverse and beneficial E&S impacts of the Project have been identified and assessed against the established baseline. A consistent approach to the assessment of impacts was followed to enable E&S impacts to be broadly compared across the ESIA. A set of generic criteria were used to determine significance (see below) which were applied across the various E&S parameters.

As far as possible, E&S impacts were quantified. Where it was not possible to quantify impacts, a qualitative assessment was conducted using professional experience, judgment and available knowledge, and including the consideration of stakeholder views. Where there were limitations to the data, and/or uncertainties, these have been recorded in the relevant chapters, along with any assumptions that were taken during the assessment.

In order to determine the significance of each impact, two overall factors are considered:

- The importance and/or sensitivity of the E&S receiving parameter, as determined during the assessment of baseline conditions; and
- Magnitude and Nature of the impact.

3.4.2 Sensitivity of the Receiving Parameter

Receiving parameter sensitivity was determined using information taken from the baseline description on the importance, significance or value of the E&S component under examination. It is important to understand the sensitivity of the receiving parameter, as this is a measure of the adaptability and resilience of an E&S parameter to an identified impact. The following categories of sensitivity were applied to the assessment:

- High: The E&S parameter/receptor is fragile and an impact is likely to leave it in an altered state from which recovery would be difficult or impossible;
- Medium: The parameter/receptor has a degree of adaptability and resilience and is likely to cope with the changes caused by an impact, although there may be some residual modification as a result; and
- Low: The parameter/receptor is adaptable and is resilient to change.

3.4.3 Magnitude and Nature of the Impact

The magnitude of the impact is the scale of change which the impact may cause compared to the baseline and how this change relates to accepted thresholds and standards. The following categories were applied to the assessment:

- High: a large change compared to variations in baseline. Potentially a clear breach of accepted limits;
- Medium: change which may be noticeable and may breach accepted limits; and
- Low: when compared with the baseline, change which may only just be noticeable. Existing thresholds would not be exceeded.

Furthermore, in determining the magnitude of the impact it is important to take into account and consider several other factors which define the nature of the impact. This includes the following:

Type of Impact

- Positive: applies to impacts that have a beneficial E&S result, such as enhancement of conditions; and
- Negative: applies to impacts that have a harmful aspect associated with them such as loss or degradation of E&S resources.

Type of Effect

- Direct: applies to impacts which can be clearly and directly attributed to a particular E&S parameter (e.g. generation of dust directly impacts air quality); and
- Indirect: applies to impacts which may be associated with or are subsequent to a particular impact on a certain E&S parameter (e.g. high levels of dust could affect occupational health and safety).

Duration (how long the stressor or its effect last)

- Short Term: applies to impacts whose effects on the E&S attributes will disappear within a 1-year period, or once construction activities are completed;
- Medium Term: applies to impacts whose effects on E&S attributes will disappear within 5-years; and
- Long Term: applies to impacts whose effects on E&S attributes will disappear in more than 5 years.

Reversibility

- Reversible: applies to impacts whose significance will be reduced and disappeared over time (either naturally or artificially), once the impacting activity ceases; and
- Irreversible: applies to impacts whose significance will not be reduced nor disappeared over time (either naturally or artificially), once the impacting activity ceases.

Likelihood

- Low: applies to impacts that are unlikely to occur for several reasons either related to onsite conditions, nature of construction activities or other factors.
- Medium: applies to impacts that are likely to occur
- High: applies to impacts that are almost certain to occur

3.4.4 Assessing the Significance of the Impacts

The concept of ‘significance’ is central to the ESIA process and aids the identification and categorization of E&S effects. As noted, in order to determine impact significance, the sensitivity of each E&S parameter/receptor is considered in combination with the magnitude of the impact. The table below demonstrates how these parameters are considered in the assessment of significance.

Table 6: Determination of Significance

Sensitivity of Receiving Parameter/Receptor \ Magnitude of Impact	Low	Medium	High
	Low	Not significant	Minor
Medium	Minor	Moderate	Moderate
High	Minor	Moderate	Major

While the above matrix provides a framework for the determination of significance, and enables comparison across E&S parameters, a degree of professional judgement must be used and some parameter-specific factors to be considered in making the determination of significance. Below provides additional guidance to the degrees of significance used in this ESIA. Note that positive impacts are defined but are not rated for significance.

- **Major significance**: requires thorough investigation in the ESIA. These impacts have been studied extensively by consulting expertise in the areas of the identified impacts to design needed mitigation and E&S management measures. Moreover, conducting specific studies and assessments to some of the key issues identified;
- **Moderate significance**: requires reasonable investigation in the ESIA. These impacts have been studied by expertise in the areas of the identified impacts to design needed mitigation and E&S management measures.
- **Minor significance**: must be listed, and addressed in some way, but which did not require detailed assessment in the ESIA.
- **Not significant**: for completeness, impacts which have been included in the assessment but determined not to be significant, are rated formally as ‘not significant’.

3.4.5 Management Measures

Based on the impact assessment undertaken a set of management measures are identified for each impact which aims to address it. Management measures include the following:

- **Additional Requirements**: those are generally regulatory requirements which have been identified and which must be taken into account at a later stage.
- **Additional Studies**: for certain E&S receptors additional studies must be undertaken at a later stage. Such studies and their scope, timing, etc. have been highlighted were relevant.
- **Mitigation Measures**: a vital step in the ESIA process is the identification of measures that can be taken to ensure that impacts are mitigated or reduced to acceptable levels. The ESIA will firstly consider the significance of any impacts caused by the Project and then assigned mitigation options through applying the following hierarchy:

- Avoiding or ‘designing out’ impacts wherever possible;
- Considering alternatives or modifications to the design to reduce the impacts wherever possible;
- Applying measures to minimize and manage impacts on the receptor; then
- As a last resort, identifying fair compensation, remediation and offsetting measures to address any potentially significant residual effects.

Some negative impacts can be easily mitigated, whilst others cannot or are too difficult and costly to mitigate. The various potential impacts are described in this ESIA, along with the provision of ‘feasible mitigation measures’ that can be implemented.

- **Recommendations**: for positive impacts it is not possible to identify mitigation measures, but rather recommendations have been identified which aim to enhance the positive impact.

3.4.6 Assessment of Residual Significance

If there are mitigation measures it is then necessary to make an assessment of the ‘residual significance’ after mitigation has been taken account. A re-assessment of Project impacts is then made, taking into account the effect of the proposed mitigation measures in order to determine the significance of the residual effects. Residual effects are discussed for each E&S theme in the ESIA chapters, and their significance determined and summarized in an Impact Assessment Table in “Section 7.4”.

3.4.7 Assessment of Cumulative Impacts

For each of the impacts assessed, the ESIA investigates the cumulative impacts which could result from incremental impacts from other known existing and/or planned developments in the area, and based on currently available information on such existing/planned developments. Assessment of cumulative impacts is presented in “Section 21”.

3.4.8 Assessment of Associated Facilities

As discussed earlier, for the purpose of this Project, the key associated facility is the Overhead Transmission Line (OHTL) that will connect from the three (3) Project substations to the national grid in order to supply electricity to end users. The OHTL for this Project will be a high voltage line (500kV) that will run for around 800km. The OHTL will run from the Project site up until the Bukhara Region connecting with the national grid at various areas along the way through three (3) substations.

“Section 23” presents the following:

- Outcomes of E&S baseline studies undertaken to date for the OHTL;
- Key risks and impacts anticipated from the development of the OHTL; and
- Key mitigation and monitoring measures that will be implemented.

3.5 Development of Environmental and Social Management Plan (ESMP)

Based on the results of the impact assessment, development of management measures, and development of monitoring plan, an ESMP was compiled into a single table that details all of the above. The ESMP will be a key document and will list the E&S requirements and detail the procedures necessary for managing the significant E&S issues connected to proposed Project activities. The ESMP will be developed specifically to provide flexibility in the nature and exact location of operations, while ensuring all potential impacts are identified and properly mitigated and monitored throughout the later stages of the Project. This framework ESMP can be used as a stand-alone document during the different phases of the Project by Developer, EPC Contractor, Ministry of Ecology, Environmental Protection, and Climate Change, and other responsible parties.

The ESMP aims to provide high level mitigations and requirements for managing the E&S risks anticipated from the Project. Throughout the Project's construction and operation phase an Environmental, Social, Health, and Safety Management System (ESHS MS) must be implemented by all relevant parties (i.e. Developer, EPC Contractor and Project Operator). The ESHS MS must be project and site specific and must build on and take into account the requirements of the framework ESMP presented throughout this document. The development and implementation of an ESHS MS is considered a key requirement under international E&S standards and requirements. The ESIA also identifies the overall framework, structure and key requirements for the ESHS MS for the key entities involved in the Project.

4. ANALYSIS OF ALTERNATIVES

This section presents the alternatives for the Project to include site alternatives, technology, design and finally the no-action alternative.

4.1 Site Selection Alternatives

As discussed earlier under “Section 1.1”, the Developer signed an MoU with the Ministry of Energy and Ministry of Investments and Foreign Trade of the Republic of Uzbekistan.

Based on the above, the Government provided the Developer with a total area of 4,600km² from which they were to select the required area as a Project boundary for the development of a 1.5GW Wind Farm. The Developer had no influence, authority or control over the Government in the selection process or identification of the 4,600km² area. This 4,600km² land area is presented in the figure below.

An exclusivity period was granted by the Government, within which the Developer was required to conduct a due diligence and select the Project boundary. As part of this due diligence phase, the Developer took into account key E&S considerations that influenced the selection of the Project boundary, all of which are discussed in further details below.

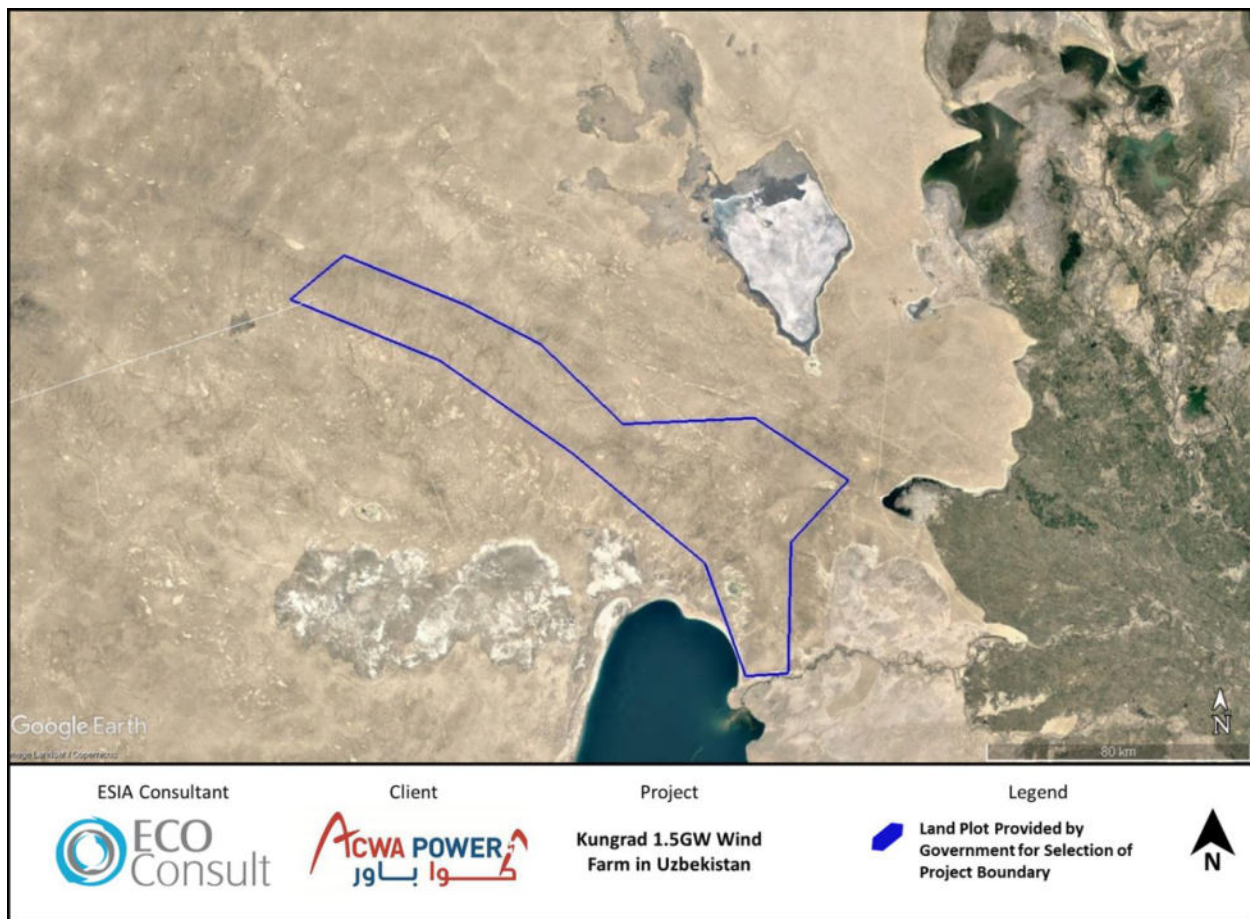


Figure 14: Land Plot Provided by Government for Selection of Project Boundary

4.1.1 Biodiversity and Avifauna

Consultations were undertaken in late 2022/early 2023 with the State Committee of the Republic of Uzbekistan for Ecology and Environment Protection⁵ and Uzbekistan Society for the Protection of Birds to identify and map out any restrictions in relation to Key Biodiversity Areas (KBAs). This included Important Bird Areas (IBA), reserves, parks, etc. Additional details on the outcomes of consultation are provided in “Section 6.3.1”. The outcomes included the identification of several areas of interest to include:

- South Ustyurt National Nature Park;
- Sarykamysh lake and Surrounding Ustyurt Plateau IBA;
- Northern part of the Assake-Audan depression IBA; and
- Sarygamysh IBA.

Additional details on the above KBAs are provided in “Section 11”.

The 4,600km² area overlaps with both the South Ustyurt National Park and Sarykamysh lake IBA. As noted in Figure 19 below, both of these areas were avoided during the selection of the final Project boundary.

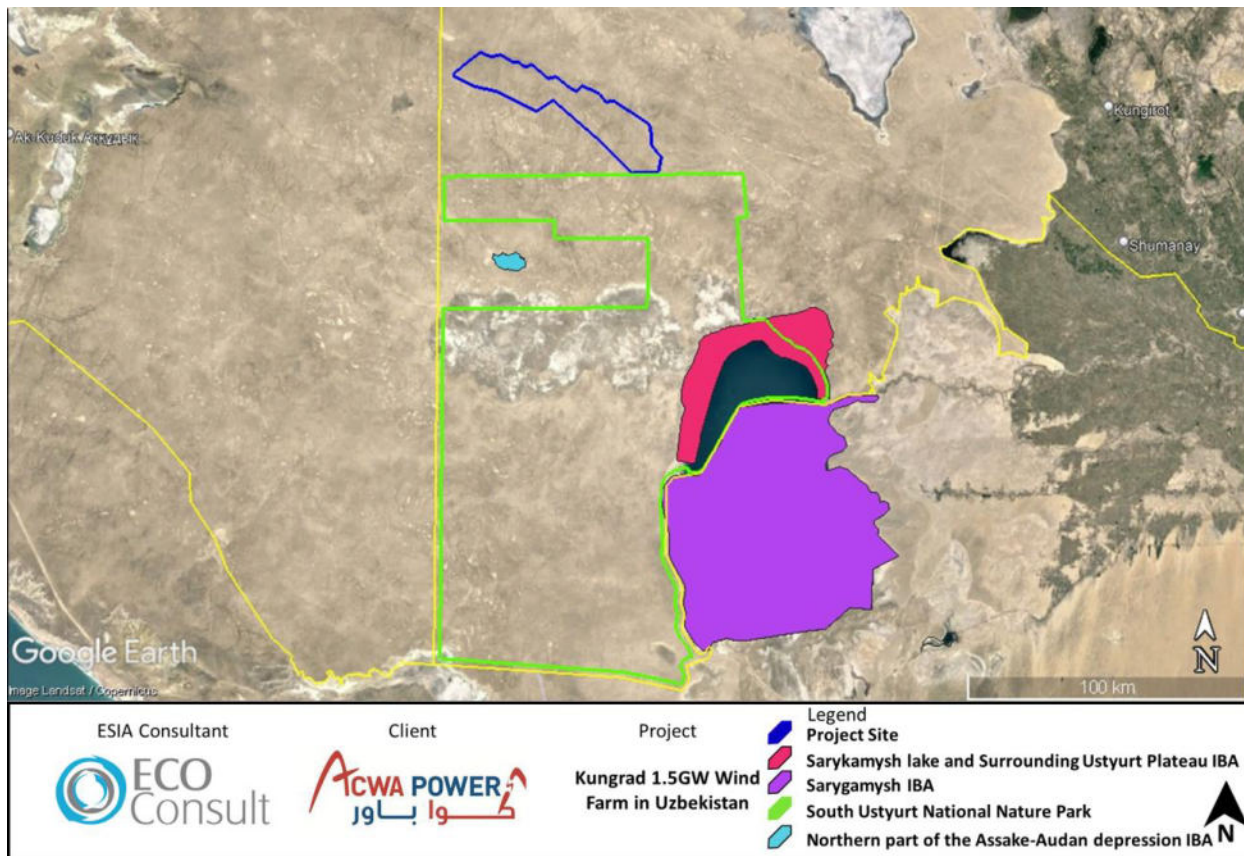


Figure 15: Project Site in Relation to KBAs

⁵ A recent restructuring within governmental units in Uzbekistan occurred in June 2023 under which it was named as the Ministry of Ecology, Environmental Protection and Climate Change. In December 2022 it was called the Ministry of Natural Resources and prior to that it was known as the State Committee of the Republic of Uzbekistan for Ecology and Environment Protection.

4.1.2 Archeology and Cultural Heritage

Consultations were undertaken with Agency of Cultural Heritage and Karakalpak Research Institute for the Human Sciences to identify any possible archeology and/or cultural heritage sites within the area. Additional details on the outcomes of consultation are provided in “Section 6.3.1”.

Such entities provided key sites known within the area based on previous surveys undertaken within the region. As noted in the figure below, several sites were located within the 4,600km² area. All these areas were avoided for selection of the final Project boundary.

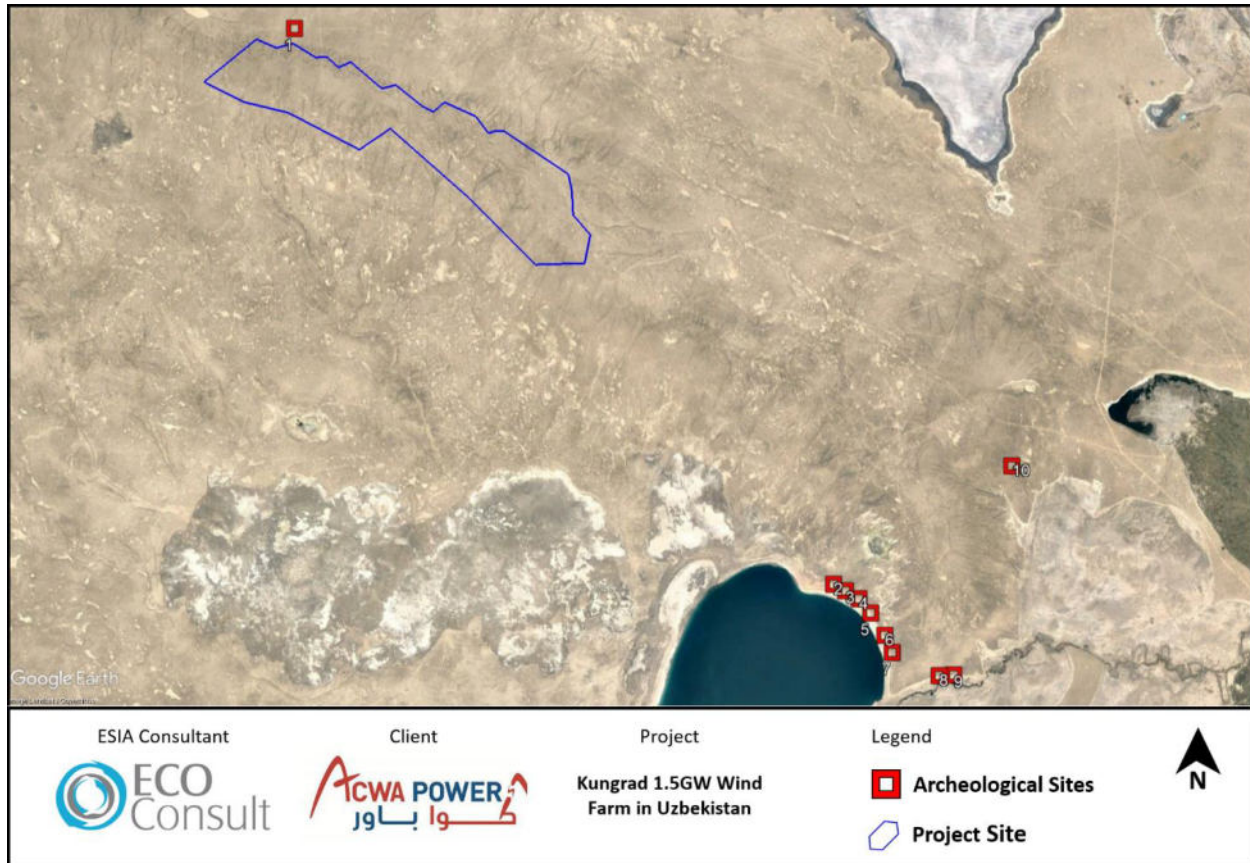


Figure 16: Identified E&S Constraints - Archeological Sites

4.1.3 Land Use

Consultations were undertaken with the Department of the Republic of Karakalpakstan of the Chamber of State Cadasters in order to identify land tenure of the sites and therefore avoid to the extent possible any acquisition process as well as physical and/or economical displacement impacts. Additional details on the outcomes of consultation are provided in “Section 6.3.1”.

Data indicated that the entire 4,600km² parcel is under governmental ownership. In addition, a satellite image review and a rapid site visit was undertaken to the area in order to verify any possible land use activities onsite so that they are taken into account. None were recorded. Therefore, based on this, no restrictions on land use were considered for the final Project boundary.

4.1.4 Gas Exploration Activities

The area is well known for gas exploration activities. Therefore, consultations were undertaken with the State Committee on Geology and Mineral Resources of Republic of Uzbekistan in order to identify any areas for development that should be avoided. Additional details on the outcomes of consultation are provided in “Section 6.3.1”.

The Committee stated that within the 4,600km² area there are sites which will entail important exploration activities and therefore should be avoided. The Committee provided an area within which the Project boundary should be considered. As noted below, a very small part of the Project boundary is located within this area. This issue is discussed in further details in “Section 14.1.7” and appropriate measures have been identified to account for this.

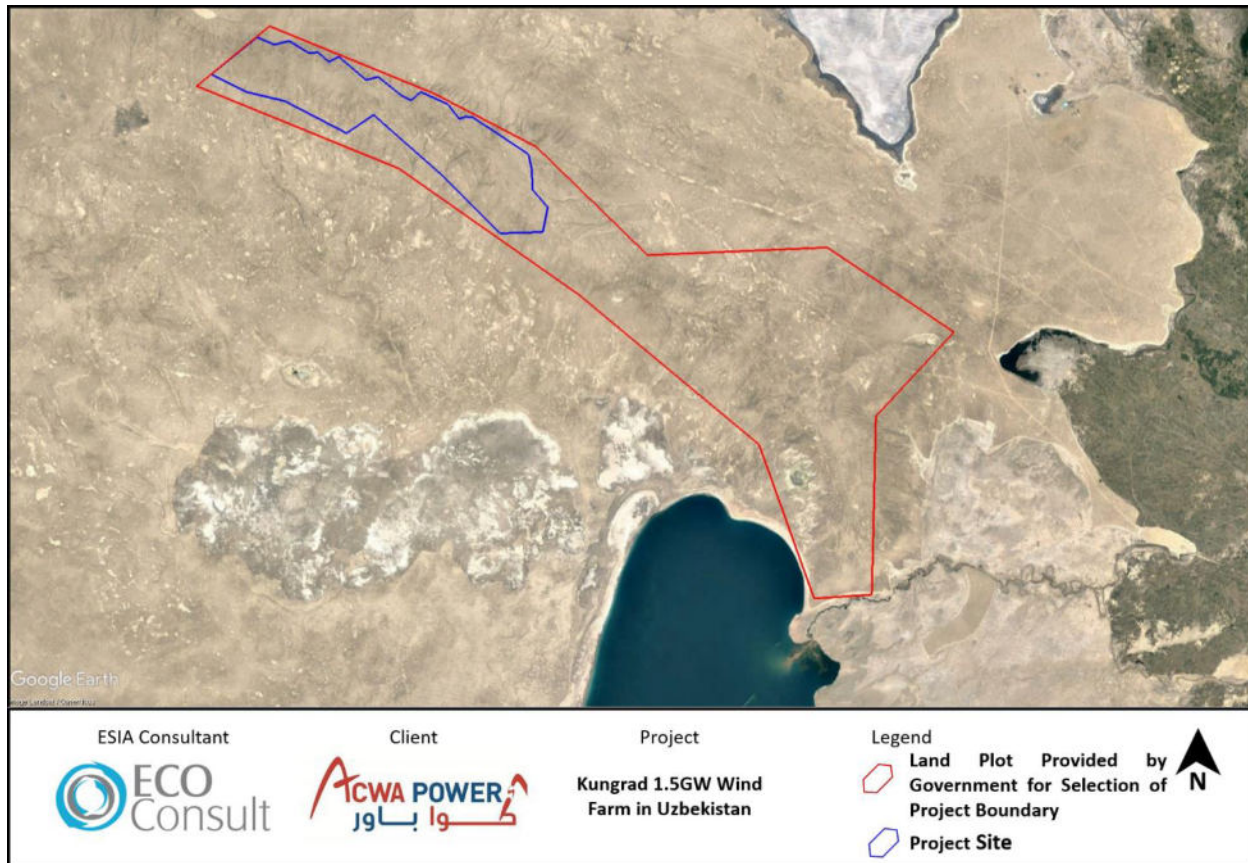


Figure 17: Identified E&S Constraint - Land Plot provided by the Government

4.1.5 Community Settlements

Data was obtained on all potential community settlements within the area to ensure boundary is sited away from such areas to the extent possible. As noted in the figure below, the closest were all located at a significant distance from the 4,600km² area. Therefore, based on this, no restrictions on community settlements were considered for the Project boundary.

This includes the following settlements:

- Kirkkiz town located around 110km to the east of the Project site;

- Elobod town located around 120km to the east of the Project site;
- Jasliq town located around 115km to the north of the Project site; and
- Kungrad City Center located around 150km to the east of the Project site.

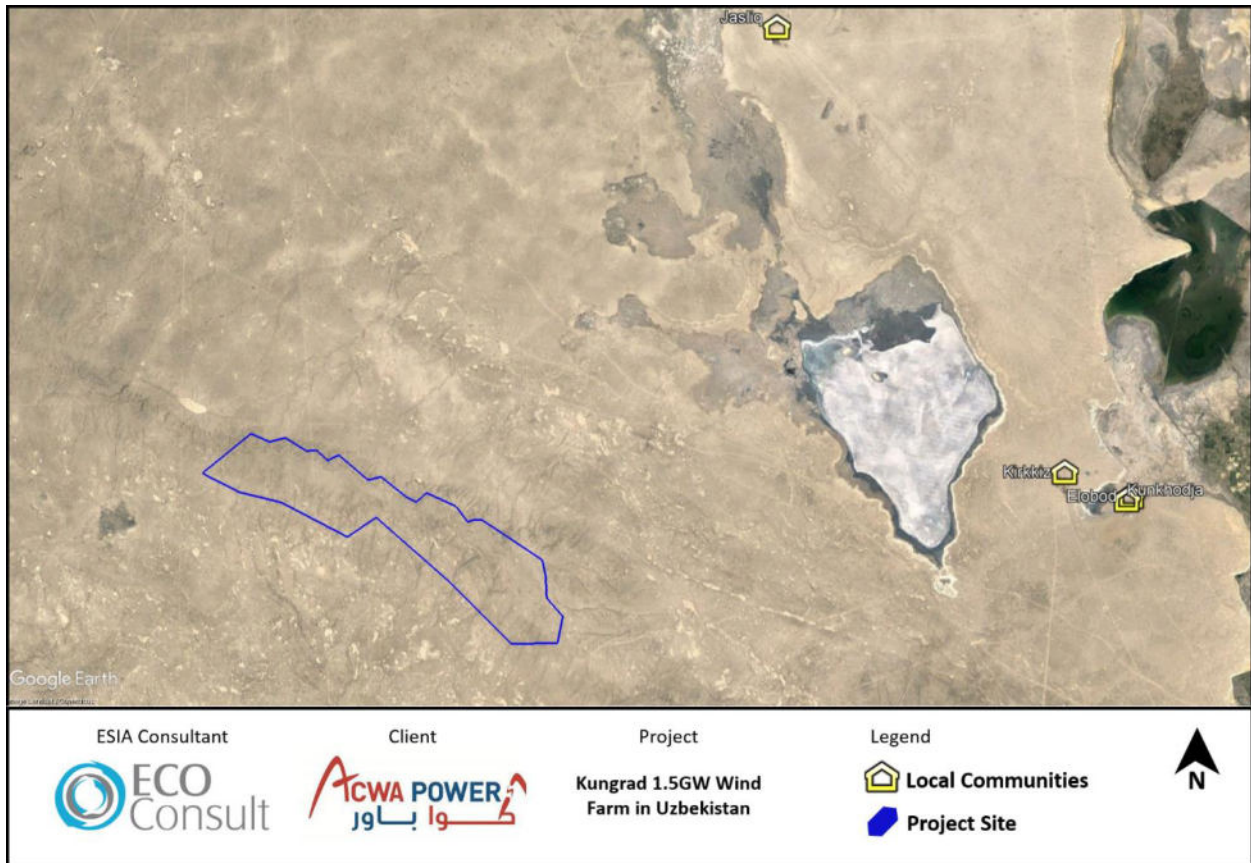


Figure 18: Identified E&S Constraint - Community Settlements

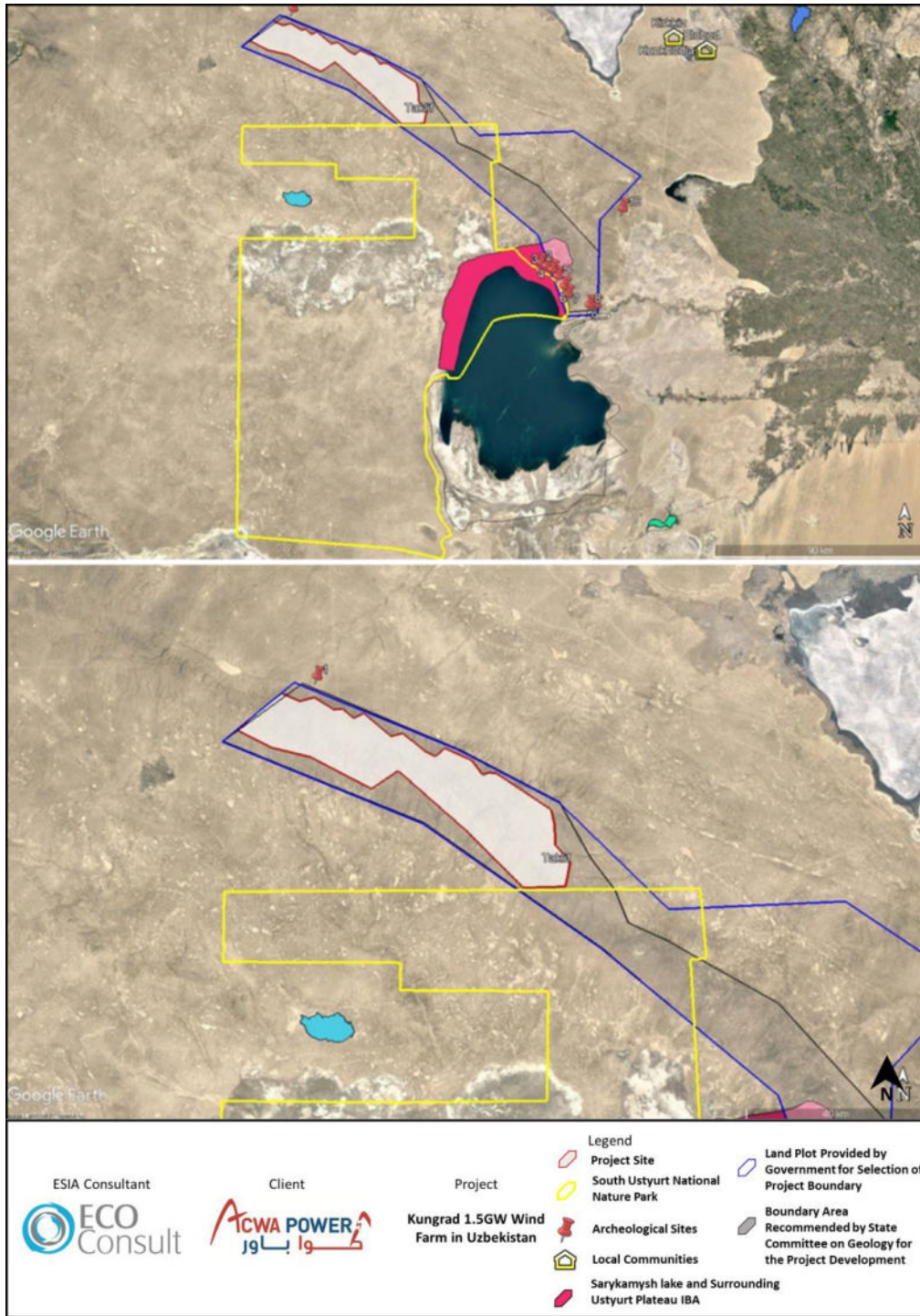


Figure 19: 4,600km² area, Project Site and E&S Constraints Identified

4.2 Technology Alternatives

This section discusses several alternatives besides the development of a wind farm project which are relevant within the context of Uzbekistan.

Based on the latest available statistics, 83% of the country's electricity is generated by gas, 13% by hydropower, and 4% by coal,⁶ with renewable energy (solar and wind) expected to achieve 25% of the electricity mix by the year 2030.

4.2.1 Solar PV

The figure below presents a solar resources map for Uzbekistan. The map provides a concise overview of the projected solar PV power generation capacity for the country. As noted in the figure below, the Project site is located in an area with the lowest potential in country estimated at 1400 kWh/kWp as opposed to key optimal areas within regions like Bukhara which have an estimated potential at 1640 kWh / kWp⁷.

Therefore, the Project site is not located within an area considered to be optimal for solar PV generation and therefore this option has been excluded.

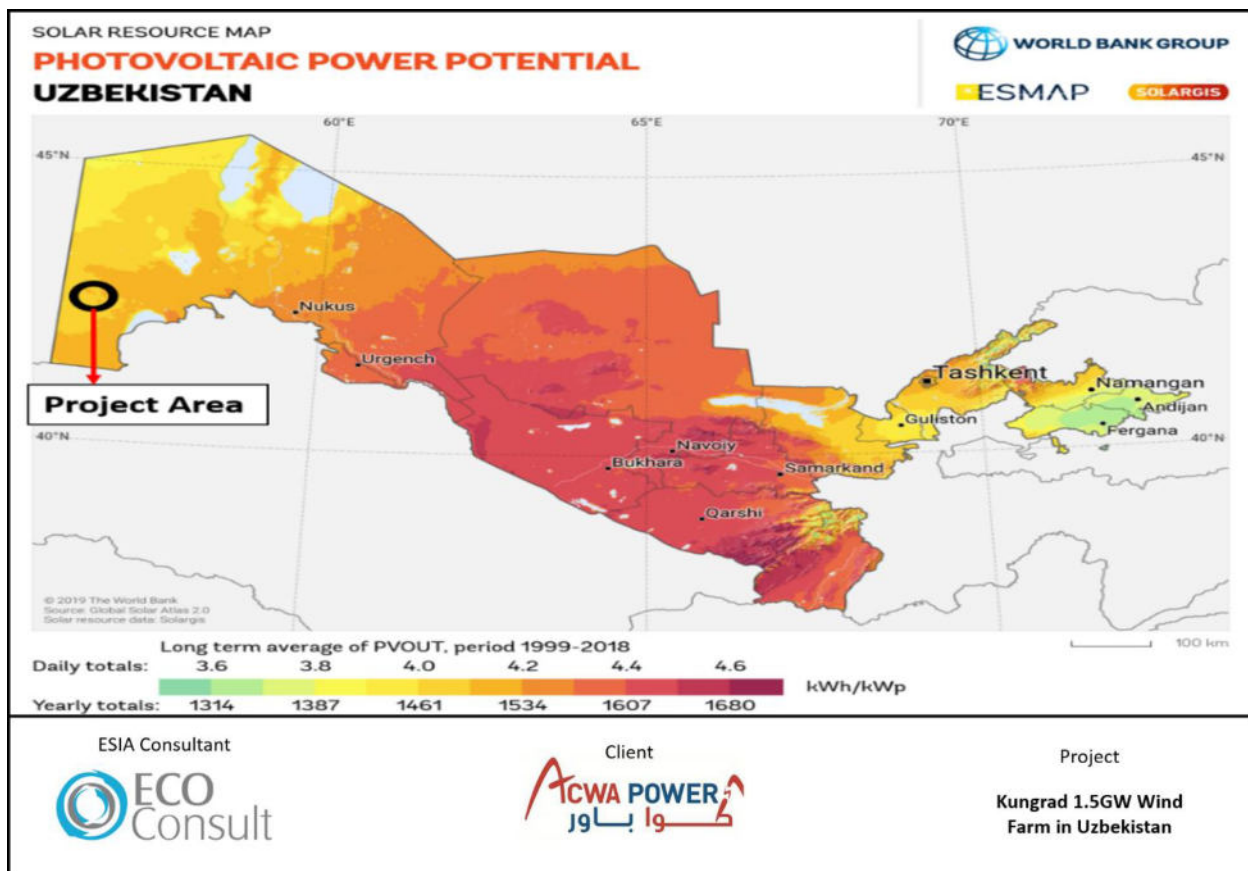


Figure 20: Solar Resource Map for Uzbekistan

⁶ *[Modern state of the energy sector of Uzbekistan and issues of their development \(e3s-conferences.org\)](http://e3s-conferences.org)

⁷ Global Solar Atlas

4.2.2 Hydropower

The figure below presents the surface water resources within Uzbekistan. As noted, within the Project area there are no key surface water resources. Therefore, the Project site is not located within an area considered to be relevant for hydropower generation and therefore this option has been excluded.

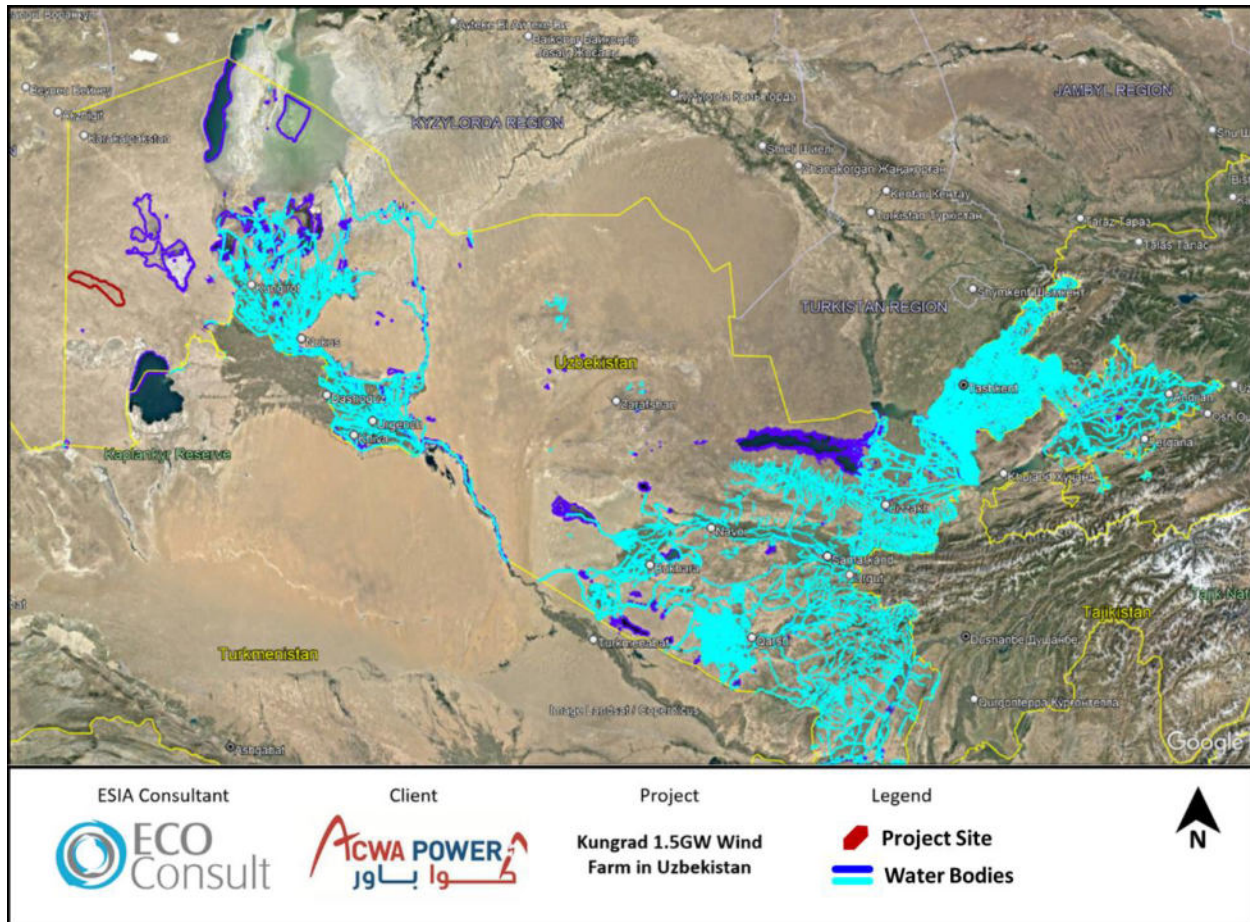


Figure 21: Water Resources in Uzbekistan

4.2.3 Thermal Power Plants

Other energy generation alternatives suitable to be built in Uzbekistan include conventional thermal power plants, similar to others already existent in the country. As noted earlier, this dominantly includes natural gas thermal power plants (accounting for 83% of the country's electricity) and some coal (estimated at 4%).

Despite the advantages that a solution of this kind would entail - such as a potential bigger energy generation capacity or the creation of more jobs during both construction and operation - the disadvantages would be significant; especially those related to environmental impacts. Conventional thermal power plans are well known for their E&S impacts when compared to this Project and could include significantly higher water consumption, generation of air pollutants and greenhouse gas emissions, etc.

More importantly, as noted earlier such developments would not be in line with the Government's policies

which on broad terms advocates for the diversification of energy resources and increasing the share of renewable energy to 25% by the year 2030.

Based on the above, this option has been excluded.

4.3 Design Alternatives

The Developer has prepared an initial layout for the Project that is being updated on a continuous basis at this point. The Developer is committed to ensuring that all identified E&S constraints throughout the ESIA process are considered fully throughout the Project design, specifications and layout.

Taking the above into account, the layout and design discussed earlier under “Section 2.3” for the Project components has taken into account the following site-specific constraints:

4.3.1 Infrastructure and Utilities

- Avoidance of the existing gas pipeline that runs within the Project site along with a 250m buffer as required by the pipeline operator. This is discussed in further details in “Section 14”.

4.3.2 Biodiversity and Birds

- A topography survey was undertaken for the entire Project area. The ‘E&S team’ required the topography team to map out as part of their scope all existing tracks/dirt roads within the Project site. The objective is that the Developer’s design team consider such existing tracks/dirt roads as part of the internal road layout requirements to minimize impacts on biodiversity and minimize the amount of natural habitat being lost. This issue is discussed in further details under “Section 11”. The figure below presents the existing tracks/dirt roads and the final internal road network. Similar to the above, the access roads have also followed to the greatest extent possible existing tracks/dirt roads to minimize impacts on biodiversity in particular.
- As part of the biodiversity and baseline surveys, key species were recorded onsite from which a buffer distance has been considered. This issue is discussed in further detail in “Section 11”.
 - Honey Badger burrows
 - Steppe Eagle nests
 - Long-legged Buzzard nests
- Throughout earlier communication in 2022 on the Project with the State Committee of the Republic of Uzbekistan for Ecology and Environment Protection, they required a 10-km setback distance from the South Ustyurt National Park. This issue is discussed in further detail in “Section 6.3”. However, a dedicated workshop was undertaken by the ‘E&S Team’ (refer to “Section 6.3.2”) with biodiversity experts and relevant governmental entities that included providing scientific justification based on international best practice as well as available site-specific data to date on why a 10-km setback distance is not required. Based on the outcomes of the workshop, it is expected that an updated official communication is to be received revising the setback distance to 2-3km which has been taken into account as part of the design.

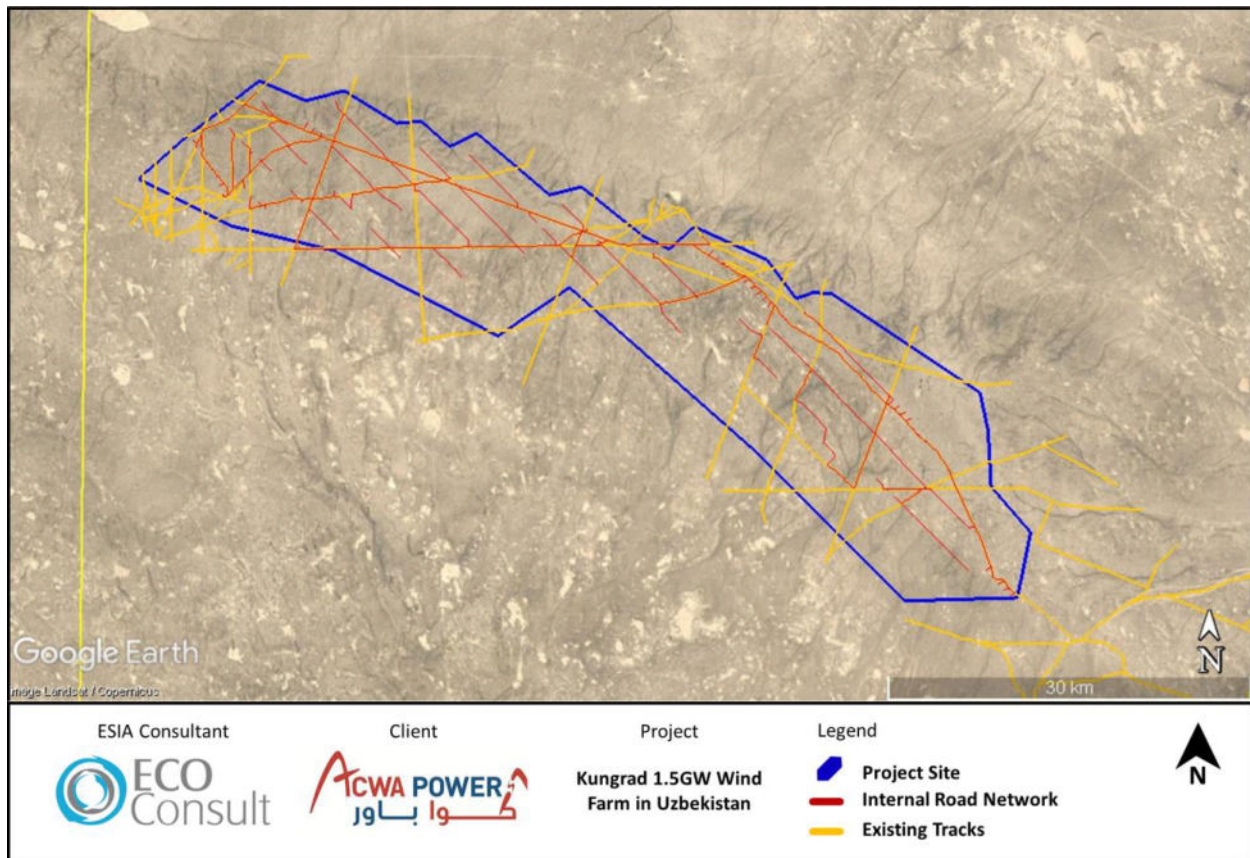


Figure 22: Existing tracks and Final Roads

4.3.3 Archeology and Cultural Heritage

- As part of the archeology and cultural heritage baseline survey, several sites were recorded within the Project boundary all of which have been avoided along with appropriate buffer distances. This issue is discussed in further details under “Section 12”.

4.4 No-Project Alternative

The ‘no Project’ alternative assumes that the 1,500MW Project will not be developed. Should this be the case, then the Project site area would remain the same. The land area would remain with its current characteristics – a vast desert grounds with sparse vegetation with no particular land use.

Should the Project not move forward, then the Project-related negative E&S impacts discussed throughout this ESIA would be averted. However, as noted throughout the ESIA, generally such impacts do not pose any key issues of concern and can be adequately controlled and mitigated through the implementation of the ESMP discussed in “Section 22”. Nevertheless, should the Project not move forward; the significant and crucial positive economic and E&S benefits would not be realized. Such benefits include the following:

- This development allows for more sustainable development and shows the commitment of the Government of Uzbekistan to realizing the energy strategy;

- Contribute to increasing energy security through development of local energy resources and reducing dependency on external energy sources;
- The clean energy produced from renewable energy resources is expected to reduce consumption of alternative fuels for electricity generation, and will thus help in reducing greenhouse gas emissions, as well as air pollutant emissions; and
- Project is expected during the construction and operation phase to generate local employment and commit to other social responsibilities. As such, this is expected, to a certain extent, to subsequently enhance the socio-economic conditions and standards of living of the local communities.

In conclusion, an ESIA must investigate all potential positive and negative impacts from a project development. In the case of this Project, it is important to weigh the significant positive economic and E&S impacts incurred from the Project development, against the negative E&S impacts anticipated at the site-specific level – in which generally this ESIA concludes to be minor in nature and can be adequately controlled. The comparison in this chapter clearly concludes that the ‘no Project’ alternative is not a preferable option.

5. REGULATORY AND POLICY FRAMEWORK

This section presents the environmental clearance process in Uzbekistan, the key E&S legislations that are applicable for the Project, and the relevant international E&S standards and requirements.

5.1 Environmental Clearance Process in Uzbekistan

The Ministry of Ecology, Environmental Protection and Climate Change is the primary environmental regulator who reports directly to the Parliament and is responsible at national, regional and local levels for the development and enforcement of the national environmental and conservation policy, issuing environmental permits, overseeing environmental compliance, and integrating environmental management across various sectors.

The Ministry's mandate is set forth in the Regulation on the State Committee for Nature Protection of the Republic of Uzbekistan enacted by the Parliament in 1996, including issuance of environmental permits for development projects.

The Uzbekistan EIA requirements are set forth within the "Resolution №541 of the Cabinet of Ministers on Procedure of EIA Mechanism (07 September 2020)". The EIA process is known as Otsenka Vliyaniya na Okruzhayushchuyu Sredu (OVOS) within the local context.

Annex 1 of the Resolution classifies any electricity generation projects that exceed 300MW as Category 1, which will require the undertaking of an EIA study in order to obtain an environmental permit (EIA study is known as PZVOS within the local context). Category 1 EIA studies should be submitted to the central Ministry in Tashkent and not its representative ministry in Karakalpakstan.

The key components of the EIA study (or PZVOS) for Category 1 projects includes the following:

- Public hearing: a public hearing is required to be undertaken for the Project which should take place with the Karakalpakstan District Khokimiyat.
- Current state of the environment (before the project implementation): physical and geographical location, climatic characteristics of the area, existing sources of anthropogenic impact on the environment, condition of atmospheric air, geomorphological characteristics of the area, surface and ground water, soil, flora and fauna, noise, cultural heritage sites and socio-economic aspects.
- Characteristics of the design object: description of the production facility, production technology with the provision of a master plan of the facility being designed and a technological scheme of production, data on water supply and sanitation, data on waste generated and methods of their processing.
- Assessment of the types and levels of impact on the environment
- Assessment of existing alternatives
- Assessment of possible emergency situations with environmental impact at the enterprise
- Environmental control and management measures
- Forecast of the state of the environment after the implementation of the project

The Draft EIA is then submitted to the Ministry for review. A conclusion is received within four (4) weeks following submission. The conclusion will either include approval of the EIA and issuance of environmental

permit or determination for a ZVOS. The ZVOS involves update of the PZVOS (i.e. EIA) with any additional information / research / surveys as requested by the Ministry based on their review of the PZVOS.

The environmental permit that will be issued will be for the construction phase of the Project. Prior to the operational phase, the Developer will be required to submit the ZEP, which is the final stage of the OVOS to be conducted prior to Project commissioning. This involved submission of a report that details any minor modifications compared to the submitted PZVOS as well as reporting normative to be provided during the operational phase.

5.2 Uzbekistan E&S Regulatory Context

This section lists those legislations that are directly related to E&S compliance that must be adhered to by all parties involved in the Project throughout the planning and construction, operation, and decommissioning phase. These legislations include: (i) those issued by the Ministry of Ecology, Environmental Protection and Climate Change (laws, regulations and instruction), and (ii) the relevant national legislations issued by other line ministries (laws, regulations, instructions, standards).

The table below lists the key relevant legislation to each of the E&S parameter and attributes being studied and assessed within this ESIA. **Annex I** presents a full legal review of each of the legislations provided below along with its relevance for the Project development.

Table 7: National Legislation and Guidelines Governing the E&S Compliance for the Project

Legislation
Environmental Management
Constitution of the Republic of Uzbekistan
Environmental Audit Law No. ZRU-678 of 2021
Law on Efficient Use of Power Energy of 1997
Law on Environmental Control of 2013
Law on Renewable Energy Sources of 2019
Land Use
Decree of the President of the Republic of Uzbekistan №5495, "On measures on major improvement of the investment climate in the Republic of Uzbekistan."
Land Code of 1998
Law of the Republic of Uzbekistan No. ZRU-728 "On the privatization of non-agricultural land plots."
Law of the Republic of Uzbekistan №ZRU-781 on Procedures for Withdrawal of Land Plots for Public Need with Compensation
Law of the Republic of Uzbekistan on State Land Cadaster No.666-1 of 1998
Presidential Decree 6243 of 2021, "On Measures to Ensure Equality & Transparency in Land Relations, Reliable Protection of Land Rights & their Transformation into a Market Asset."
Presidential Decree No. UP-5742 "On Measures for The Efficient Use of Land and Water Resources in Agriculture" of 2019
Resolution of 2011 "On the procedure for compensation for losses of owners, users, tenants and owners of land plots, as well as losses in agricultural and forestry production."
Resolution of Cabinet Ministers №3857, "On procedure for preparation and implementation of projects with the participation of International Financial Institutions and foreign Governmental Financial Organizations."
Resolution of Cabinet of Ministers No.317 "On amending and adding to some decrees of the Republic of Uzbekistan, aimed the further improvement of registration of cadastral document on a real property."
Resolution of Cabinet of Ministers № 146, "On measures to improve the procedure for providing land plots for urban planning activities and other non-agricultural needs."
Resolution of Cabinet of Ministers № 911, "On further improving procedures for providing property rights of individuals and legal entities and procedures for removal and compensation for land plots."

Geology, Hydrology, Hydrogeology
Resolution of the Cabinet of Ministers No. 255 "On Approval of Some Administrative Regulations of State Services in The Sphere of Nature Management."
SanPin No 0183-05: Hygienic Requirements for the Quality of Soil in Populated Areas in the Specific Natural and Climatic Conditions of Uzbekistan.
SanPin No.0191-05: Maximum Permissible Concentrations (MPC) and Approximate Allowable Concentrations (AAC) of Exogenous Harmful Substances in soil.
SanPin No.0212-06: Sanitary Rules and Norms for the Hygienic Assessment of Soil Contamination of Different Types of Land Use.
SanPin № 0272-09: Sanitary Rules and Norms for Drawing Up Hygienic Justifications for Soil Protection Schemes from Pollution in the Conditions of Uzbekistan.
Biodiversity
Law № 73-II on Environmental Expertise
Law on Nature Protection of 1992
Law ZRU-363 on Environmental Control
Law ZRU-678 on Environmental Audit
Presidential Decree No. UP-5863 "Validating the Strategy for Environmental Protection in The Republic of Uzbekistan Until 2030."
Resolution of Cabinet of Ministers of Republic of Uzbekistan No. 95 "On Approval of General Technical Regulations of Environmental Safety."
Resolution of the Cabinet of Ministers No. 286 "Standard Regulations on the Procedure for Implementing Industrial Environmental Control."
Resolution of the Cabinet of Ministers No. 484 "On Approval of the Strategy for the Conservation of Biodiversity in The Republic of Uzbekistan for the Period 2019-2028".
Resolution of the Cabinet of Ministers No. 86 "Approval of The Uniform Regulation on the Procedures for Issuing Certain Documents Through a Special Electronic System."
Resolution of the Cabinet of Ministers No. 93 "On Additional Measures to Conserve Valuable Varieties of Trees and Shrubs Not Included in the State Forest Fund".
The Law of the Republic of Uzbekistan № 543-I "On Protection and Use of Flora and Vegetation."
The Law of the Republic of Uzbekistan № 710-II "On Protected Natural Reserves."
The Law of the Republic of Uzbekistan № 73-II "On Ecological Expertise."
The Law of the Republic of Uzbekistan ZRU-408, "On Protection and Use of the Wildlife."
The Red Book of the Republic of Uzbekistan
The Resolution of Cabinet of Ministries of the Republic of Uzbekistan No. 820 "On Measures to Further Improve the Economic Mechanisms for Ensuring Nature Protection."
The Resolution of the Cabinet of Ministers of the Republic of Uzbekistan No. 14. "On Approval of the Regulation on the Procedure for the Development and Agreement of Projects with Environmental Standards."
The Resolution of the Cabinet of Ministries of the Republic of Uzbekistan No. 541 "On further improvement of the environmental impact assessment mechanism."
The Resolutions of Cabinet of Ministers of the Republic of Uzbekistan No. 290 "About the Settlement of Use of Biological Resources and about the Procedure for Passing of Allowing Procedures in the Field of Environmental Management."
Archaeology and Cultural Heritage
Constitution of the Republic of Uzbekistan
Criminal Code of the Republic of Uzbekistan
Code of the Republic of Uzbekistan on Administrative Responsibility
Law No. ZRU-229 "On Protection and Use of the Objects of Archaeological Heritage."
Law No. 269-II "On the Protection and Use of Cultural Heritage Sites."
Resolution of the Cabinet of Ministers of the Republic of Uzbekistan № 846 "On Approval of the National List of Real Estate Sites and Objects of Tangible Cultural Heritage."
Presidential Decree No. R-5181 "On Improving the Protection and Use of Objects of Tangible Cultural and Archaeological Heritage."

Presidential Decree no. PP-4068 “Regarding the Strengthening of the Protection, Management and Enhancement of Tangible and Intangible Cultural Heritage.”
Air Quality and Noise
Sanitary Standards and Rules No. 0008-20 on Permissible Noise Levels in Residential Buildings, Public Buildings and Recreation Zones.
Sanitary Standards and Rules No. 0325-16 for Permissible Noise Levels in the Workplace
SanPin № 0293-11 “Hygienic regulations List of maximum permissible concentrations (MPC) of contaminants in the atmospheric air of inhabitant areas in the territory of the Republic of Uzbekistan.”
SanPin №. 0339-16. “Sanitary rules and norms of planning and development of settlements of Uzbekistan.”
Standard No. 0350-17, “Sanitary norms and rules for the protection of atmospheric air in populated areas of the Republic of. Uzbekistan.”
The Law of the Republic of Uzbekistan № 353- I “On Atmospheric Air Protection.”
Community Development
Decree No. 964 of 5 December 2017 "On the Measures for Perfection of the Activity of Self-Government Bodies Aimed at Ensuring Employment, firstly for the Youth and Women."
Decree of the Cabinet of the Ministers No. 1011 "On Perfection of the Methodology of Definition of Number of People in Need of Job Placement."
Resolution of the Cabinet of Ministries of the Republic of Uzbekistan No. 541 “On further improvement of mechanism for Environmental Impact Assessment.”
Infrastructure and Utilities
Construction measure (KMK) 2.10.10-97: Norms & regulations for allocation of land for railways
Criteria and Procedure for Determining International Road Transportation of Loads.
Decree of the Cabinet of Ministers of the Republic of Uzbekistan No.1050 “On approval of Rules for Protection of Power Grid Facilities
Law No. 818-I “About traffic safety” of the Republic of Uzbekistan.
Law No. ZRU-117 on Highways
Law No. ZRU-56 on Telecommunications of 1995
Law № 725-1 “On Radio Frequency Spectrum.”
Law on Electricity of 2009
Regulations on Provision of Energy Services, Resolution of the Cabinet of Ministers of the Republic of Uzbekistan.
Regulations on road safety during transportation of large and heavy loads by road transport.
Regulations on Rules for Cargo Transportation by road in the Republic of Uzbekistan
Resolution of the Cabinet of Ministers of the Republic of Uzbekistan No. 22: Rules for Using Power Energy
Resolution of the President of the Republic of Uzbekistan №PP-57, “On measures to accelerate the implementation of renewable energy sources and energy-saving technologies in 2023.”
Sanitary Norms No. 0236-07: Sanitary Standards and Regulations to Ensure Safety for Populations Living near High Voltage Power Lines.
Sanitary Rules and Regulations for The Placement and Operation of Radio Engineering Facilities in Populated Areas
Air Code for the Republic of Uzbekistan of 1993
Aviation Regulations (AP RUZ-150) Registered under No. 73
Labor and Working Conditions
Decree of the Cabinet of the Ministers No. 965 "On the Measures of Further Perfection of the Procedure of Establishment and Reservation of Minimum Number of Job Places for the Job Placement of Persons who are in need of Social protection and Face Difficulties in Searching Employment and Incapable of Competing in Labor Market with Equal Conditions."
Joint Decree of the Ministry of Labor and Social Protection of the Population (No. 33) and the Ministry of Healthcare (No. 13) of Uzbekistan “On the approval of the list of jobs with unfavorable working conditions where the employment of persons under 18 years is prohibited” registered by the Ministry of Justice of the Republic of Uzbekistan.
Labor Code of the Republic of Uzbekistan 1995
Law “On the employment of the population, No. ZRU- 642
Law No. ZRU-641 on Rights of Persons with Disabilities

Resolution of Cabinet of Ministers No. 244 “On the approval of the regulations on the procedure for the attraction and use of foreign workforce in the Republic of Uzbekistan.”
Management of Solid Waste, Hazardous Waste and Wastewater
Law No. ZRU-784 on Drinking Water and Wastewater
Regulation “On the Procedure for the Disposal, Collection, Pay Settlement, Storage and Removal of Waste Industrial Oils.”
Regulation on the Procedure for Handling Colored and Black Metal Scrap.”
Resolution of Cabinet of Ministers of Republic of Uzbekistan No. 95 “On Approval of Regulatory and Legal Acts in the Field of Waste Management.”
SanPin No. 0158-04 - Sanitarian Rules and Norms on collection, transportation and disposal of wastes contained asbestos in Uzbekistan.”
SanPin № 0127-02 “Sanitary procedures for inventory, classification, storage and disposal of industrial waste.”
SanPin № 0157-04 “Sanitary requirements to the storage and neutralization of solid domestic waste on special grounds in Uzbekistan.”
SanPin of the Republic of Uzbekistan № 0128-02 – “Hygienic classifier of toxic industrial wastes in the Republic of Uzbekistan.”
SanPin of the Republic of Uzbekistan №0300-11 “Sanitary Rules and Standards for managing collection, inventory, classification, treatment, storage and disposal of industrial waste in the context of Uzbekistan.”
The Law of the Republic of Uzbekistan No. 362-II “On Waste.”
The Resolution of Cabinet of Ministries of the Republic of Uzbekistan No. 820 “On Measures to Further Improve the Economic Mechanisms for Ensuring Nature Protection.”
The Resolution of the Cabinet of Ministers of the Republic of Uzbekistan No 14. “On Approval of the Regulation on the Procedure for the Development and Agreement of Projects with Environmental Standards.”
Occupational Health and Safety
Joint Decree of the Ministry of Labor and Social Protection of the Population (No.7) and the Ministry of Healthcare (No. 1) of Uzbekistan.
Law No. ZRU-174 “About mandatory state social insurance against industrial accidents and occupational diseases.”
Law No. ZRU-393 of the Republic of Uzbekistan “On Sanitary and Epidemiological Welfare of Population.”
Order of the Head of the State Inspectorate for Supervision in the Electric Power Industry, No. 19 “On approval of safety rules when performing electrical installation work at power facilities.”
Ordinance No. 30-31 of the Ministry of Labor and Social Security and the Ministry of Health of the Republic of Uzbekistan
Sanitary Standards and Rules No 03225-16 for permissible noise levels in the workplace
SanPin (Sanitary Rules & Norms) 0372-20 (May 2020) on “Temporary sanitary rules and regulations on the organization of activities of state authorities and other organizations.”
Standard No. 0294-11 on “Permissible Amount of Harmful Substance in Air in Working Space.”
Public Health and Safety
Sanitary Norms No. 0236-07 “Sanitary Standards and Regulations to Ensure Safety for Populations Living near High Voltage Power Lines.”
The Electrical Installation Rules
Water Resources
Decree of the President of the Republic of Uzbekistan No. PP-5005 “On approval of the strategy for water resources management and development of the irrigation sector in the Republic of Uzbekistan for 2021-2023.”
Law No. ZRU-784 on Drinking Water and Wastewater
Presidential Decree No. UP-6024 Validating the Concept for The Development of Water Sector of The Republic of Uzbekistan for The Period Of 2020-2030.
The Law of the Republic of Uzbekistan No. ZRU-837-XII “On Water and Water Use.”

5.3 International Agreements

Uzbekistan has signed and ratified a number of international conventions committing the country to the conservation of E&S resources and protection of workers' health & safety and labor rights. The following table lists the key conventions:

Table 8: Relevant International Conventions and Agreements

Name of Multilateral E&S Agreement	Year
Biodiversity and Natural Resources	
Agreement between the Government of Kazakhstan, the Government of Kyrgyzstan and the Government of Uzbekistan on Management of Water Resources in Central Asia	1996
Agreement on the Convention of African-Eurasian Migratory Waterbirds	2004
Agreement on the Cooperation in the Field of Joint Water Resources Management and Conservation of Interstate Sources	1992
Agreement on the Use of Water and Energy Resources of the Syr Darya Basin	1999
Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal	1996
Convention on Biological Diversity (CBD)	1995
Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)	1997
Convention on the Conservation of Migratory Species of Wild Animals (CMS)	1998
Convention on the Conservation of the Migratory Species of Wild Fauna and Flora	1997
Convention on the Protection and Use of Transboundary Watercourses and International Lakes (Water Convention)	2007
Convention on Wetlands of International Importance (Ramsar Convention)	2002
Kyoto Protocol	1997
Montreal Protocol on Substances that deplete the Ozone Layer	1993
Paris Agreement	2017
Stockholm Convention on Persistent Organic Pollutants (POPs)	2019
United Nations Convention to Combat Desertification (UNCCD)	1995
United Nations Framework Convention on Climate Change (UNFCCC)	1993
Vienna Convention on the Protection of the Ozone Layer	1993
Human Rights	
UN Convention on the Elimination of All forms of Discrimination against Women	1995
UN International Covenant on Economic, Social and Cultural Rights	1995
UN Convention on the Rights of a Child	2008
UN Convention on the Elimination of All Forms of Racial Discrimination	1995
UN Convention on the Rights of Persons with Disabilities	2009
UN International Covenant on Civil and Political Rights	1995
Cultural Heritage	
Convention for the Safeguarding of the Intangible Cultural Heritage	2008
Paris Convention Concerning the Protection of the World Cultural and Natural Heritage	1993
Key ILO Conventions	
Convention on the Abolition of Forced Labor (ratified 1997)	1957
Convention on the minimum Age (ratified 2009)	1973
Discrimination (Employment and Occupation) Convention (ratified 1992)	1958
Equal Remuneration Convention (ratified 1992)	1951
Forced Labor Convention (ratified in 1992)	1930
Freedom of Association and Protection of the Right to Organize Convention (ratified in 2016)	1948
Labor Inspection Convention (ratified in 2019)	1947
Minimum Age Convention (ratified 1973)	2009
Promotional Framework for Occupational Safety & Health Convention (ratified in 2021)	2006
Right to Organize and Collective Bargaining Convention (ratified 1992)	1949
Worst Forms of Child Labor Convention (ratified 2008)	1999

5.4 Requirements for Project Financing

The Project will be seeking financing from International Financing Institutions (IFIs). Therefore, the Developer wishes to design and manage the project in accordance with international E&S standards and requirements. For the ESIA, it will be based on the requirements of the following entities, each of which is discussed in further details below:

- International Finance Corporation (IFC);
- Equator Principles (EP);
- European Bank for Reconstruction and Development (EBRD); and
- Asian Development Bank (ADB).

5.4.1 International Finance Corporation (IFC)

The IFC of the World Bank provides a range of guidance documents related to the assessment and management of E&S issues in project development. Not only does IFC guidance provide a generally accepted basis for good practice, but it also provides the technical cornerstone for the Equator Principles which set out the E&S requirements of banks for project finance. The IFC requirements have become the *de facto* international E&S performance benchmark for project financing.

The IFC policy on E&S Sustainability puts into practice IFC’s overall commitments to E&S sustainability. The policy seeks to: (i) enhance the predictability, transparency, and accountability of IFC’s actions and decision making; (ii) help clients manage their environmental and social risks and impacts and improve their performance; and (iii) enhance positive development outcomes on the ground. In addition, the Policy identifies IFC’s commitments, its roles and responsibilities and other as applicable.

The IFC Performance Standards (PS) on Social and Environmental Sustainability set out a framework for managing and improving project performance from planning and assessment, through construction and operations to closure. The Performance Standards requirements are summarized in the table below.

Table 9: IFC Performance Standard Requirements

IFC PS	Key Points	Applicability to ESIA
PS1: Assessment and Management of Environmental and Social Risks and Impacts	PS1 underscores the importance of managing social and environmental performance throughout the life of a project by using a dynamic social and environmental management system. Specific objectives of this Performance Standard are: <ul style="list-style-type: none"> ▪ To identify and assess social and environment impacts, both adverse and beneficial, in the project’s area of influence; ▪ To avoid, or where avoidance is not possible, minimize, mitigate, or compensate for adverse impacts on workers, affected communities, and the environment; ▪ To ensure that affected communities are appropriately engaged on issues that could potentially affect them; and ▪ To promote improved social and environment performance of companies through the effective use of management systems. 	Applicable and considered for this ESIA
PS2: Labor and Working Conditions	The requirements set out in this PS have been in part guided by a number of international conventions negotiated through the International Labor Organization	Applicable and considered for this ESIA

	<p>(ILO) and the United Nations (UN). Specific objectives of this Performance Standard are:</p> <ul style="list-style-type: none"> ▪ To establish, maintain and improve the worker-management relationship; ▪ To promote the fair treatment, non-discrimination and equal opportunity of workers and compliance with national labor and employment laws; ▪ To protect the workforce by addressing child labor and forced labor; and ▪ To promote safe and healthy working conditions, and to protect and promote the health of workers. 	
PS 3: Resource Efficiency and Pollution Prevention	<p>This Performance Standard outlines a project approach to pollution prevention and abatement in line with international available technologies and practices. It promotes the private sector’s ability to integrate such technologies and practices as far as their use is technically and financially feasible and cost-effective in the context of a project that relies on commercially available skills and resources. Specific objectives of this Performance Standard are:</p> <ul style="list-style-type: none"> ▪ To avoid or minimize adverse impacts on human health and the environment by avoiding or minimizing pollution from project activities; and ▪ To promote the reduction of emissions that contribute to climate change. 	Applicable and considered for this ESIA
PS 4: Community Health, Safety and Security	<p>This PS recognizes that project activities, equipment, and infrastructure often bring benefits to communities including employment, services, and opportunities for economic development. However, projects can also increase risks arising from accidents, releases of hazardous materials, exposure to diseases, and the use of security personnel. While acknowledging the public authorities’ role in promoting the health, safety and security of the public, this PS addresses the project sponsor’s responsibility in respect of community health, safety and security.</p>	Applicable and considered for this ESIA
PS 5: Land Acquisition and Involuntary Resettlement	<p>Involuntary resettlement refers both to physical and economic displacement as a result of project-related land acquisition. Where involuntary resettlement is unavoidable, appropriate measures to mitigate adverse impacts on displaced persons and host communities should be carefully planned and implemented.</p>	Not applicable, Refer to “Section 9”
PS 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources	<p>This Performance Standard reflects the objectives of the Convention on Biological Diversity to conserve biological diversity and promote the use of renewable natural resources in a sustainable manner. This Performance Standard addresses how project sponsors can avoid or mitigate threats to biodiversity arising from their operations as well as sustainably manage renewable natural resources. Specific objectives of this Performance Standard are:</p> <ul style="list-style-type: none"> ▪ To protect and conserve biodiversity; and ▪ To promote the sustainable management and use of natural resources through the adoption of practices that integrate conservation needs and development priorities. 	Applicable and considered for this ESIA
PS 7: Indigenous Peoples	<p>Indigenous peoples may be particularly vulnerable to the adverse impacts associated with project development, including risk of impoverishment and loss of identity, culture, and natural resource-based livelihoods. PS7 seeks to ensure that business activities minimize negative impacts, foster respect for human rights, dignity and culture of indigenous populations, and promote development benefits in culturally appropriate ways.</p> <p>PS 7 (Indigenous Peoples) is not considered to be applicable to this Project. The Indigenous World 2018 Report (IWGIA, 2018) states that Uzbekistan is not classified as a country with indigenous people.</p>	Not applicable, Refer to “Section 6.2.2”

PS 8: Cultural Heritage	Consistent with the Convention Concerning the Protection of the World Cultural and Natural Heritage, this Performance Standard aims to protect irreplaceable cultural heritage and to guide project sponsors on protecting cultural heritage in the course of their business operations.	Applicable and considered for this ESIA
-------------------------	--	---

In addition, to the Performance Standards, the IFC have sector-specific EHS guideline documents. With regards to the ESIA the following are applicable:

- IFC General EHS Guidelines (2007): identifies detailed EHS management and technical recommendations which are applicable for all development projects; and
- EHS Guidelines for Wind Energy (IFC, 2015): Provide guidance's and information to users on EHS issues related to onshore and offshore wind energy facilities. The Guideline provides a summary of EHS impacts associated with wind energy facilities along with recommendations for their management as well as performance indicators and monitoring programs for environmental, occupational health and safety and community health and safety. Where relevant, the requirements of this guideline are reiterated clearly in subsequent sections that discuss the environmental attributes they relate to where national legislations are not available.

5.4.2 Equator Principles 4 (EP 4)

The Equator Principles Financing Institutions (EPFIs) have consequently adopted a set of E&S guidelines to ensure that large scale development projects properly determine, assess and manage the associated potential impacts on the natural environment and the affected communities.

The latest principles (EP 4) were issued in July 2020. The EP are summarized below.

Table 10: Summary of Equator Principles

No.	Principle	Discussions	Applicability for ESIA
1	Review & Categorization	Identifies categorization for projects as either Category A, B or C. This is determined by an E&S review and due diligence undertaken by the financial institution (and/or their advisor).	Not relevant for this ESIA study
2	Environmental & Social Assessment	This requires that for Category A and B projects that an Environmental and Social Impact Assessment (ESIA) is undertaken. The Principle provides guidance and illustrative list of issues that the ESIA study should address. This is discussed in further details in the table that follows. In addition, the Principle requires an assessment of potential adverse human rights impacts and climate change risks .	Applicable and considered for this ESIA
3	Applicable Environmental and Social Standards	Principle requires that assessment process comply with relevant host country laws. In addition, for projects located in Non-Designated Countries (such as the Uzbekistan) compliance with IFC Performance Standards on Environmental and Social Sustainability (Performance Standards) is required.	Applicable and considered for this ESIA
4	E&S Management System and EP Action Plan	For all category A and category B projects, the financing institution will require that the client develop and/or maintain an Environmental and Social Management System (MS). In addition, an Environmental and Social Management Plan (ESMP) must be prepared by the Client.	Applicable and considered for this ESIA
5	Stakeholder Engagement	Category A and B projects require effective and continuous stakeholder engagement with affected communities, workers and other stakeholders as relevant.	Applicable and

			considered for this ESIA
6	Grievance Mechanism	Category A and B projects require an effective grievance mechanism for affected communities and workers as appropriate to receive and facilitate resolution of concerns and grievances.	Applicable and considered for this ESIA
7	Independent Review	An independent E&S review will be undertaken for Category A and B projects will on the EIA, ESMP, ESMS, SEP and other as applicable and an Equator Principles Action Plan (EPAP) will be prepared.	Not relevant for the ESIA study
8	Covenants	The Principle requires that the Client covenant and comply with ESMP and EPAP requirements and provide periodic reports to document compliance with ESMP and EPAP and local E&S regulations.	Not relevant for the ESIA study
9	Independent Monitoring and Reporting	After financial close, for category A and B projects, financing institution will require independent monitoring and reporting to assess project compliance with Equator Principles.	Not relevant for the ESIA study
10	Reporting and Transparency	Identifies E&S reporting requirements for the client for category A and B projects.	Not relevant for the ESIA study

As discussed in the table above and specifically under Principle 2, the Principle provides guidance and illustrative list of issues that the ESIA study should address. Such issues are identified below. The ESIA ensure that all issued identified below are addressed.

- Assessment of baseline E&S conditions (applicable and considered for ESIA);
- Consideration of feasible E&S preferred alternatives (applicable and considered for ESIA);
- Requirements under host country laws and regulations (applicable and considered for ESIA);
- Protection and conservation of biodiversity and identification of legally protected areas (applicable and considered for ESIA);
- Sustainable management and use of renewable energy sources (applicable and considered for ESIA);
- Use and management of dangerous substances (applicable and considered for ESIA);
- Major hazards assessment and management (applicable and considered for ESIA);
- Efficient production (applicable and considered for ESIA);
- Pollution prevention and waste minimization, pollution control and waste management (applicable and considered for ESIA);
- Greenhouse gas emissions level and emissions intensity (applicable and considered for ESIA);
- Water usage, water intensity and water source (applicable and considered for ESIA);
- Land cover and land use practices (applicable and considered for ESIA);
- Consideration of physical climate risks and adaptation opportunities and viability of project operations under changing weather patterns/climatic conditions (applicable and considered for ESIA);

- Cumulative impacts of existing projects, the proposed project and anticipated future projects (applicable and considered for ESIA);
- Consideration of actual or potential adverse human rights impacts (applicable and considered for ESIA);
- Labor issues and occupational health and safety (applicable and considered for ESIA);
- Consultation and participation of affected parties in the design, review and implementation of the project (applicable and considered for ESIA);
- Socio-economic impacts (applicable and considered for ESIA);
- Impacts on affected communities and disadvantaged or vulnerable groups (applicable and considered for ESIA);
- Gender and gender disproportionate gender impacts (applicable and considered for ESIA);
- Land acquisition and involuntary resettlement (not applicable, Refer to “Section 9”);
- Impacts on indigenous people (not applicable, Refer to “Section 6.2.2”);
- Protection of cultural property and heritage (applicable and considered for ESIA);
- Protection of community health, safety and security (applicable and considered for ESIA); and
- Fire prevention and life safety (applicable and considered for ESIA).

5.4.3 European Bank for Reconstruction and Development

EBRD’s 2019 Environmental and Social Policy seeks to ensure, through its E&S appraisal and monitoring processes, that the projects it finances:

- Are socially and environmentally sustainable;
- Respect the rights of affected workers and communities; and
- Are designed and operated in compliance with applicable regulatory requirements and good international practice.

In addition, EBRD’s E&S policy identifies large scale wind power projects as ‘Category A’ which are projects that could result in potentially significant environmental and/or social impacts that require an environmental and social impact assessment.

To translate this objective into successful practical outcomes, EBRD has adopted a comprehensive set of Performance Requirements (PRs) covering key areas of environmental and social impacts and issues.

EBRD is committed to promoting European Union (EU) environmental standards as well as the European Principles for the Environment, to which it is a signatory, and which are also reflected in the PRs. EBRD expects clients to assess and manage the environmental and social issues associated with their projects so that projects meet the PRs.

The EBRD Performance Requirements applicable to this project are summarized in the table below.

Table 11: Overview of Key Points of EBRD Performance Requirements of Relevance to the Project

EBRD PR	Key Points Relevant to the Project	Applicability
PR 1: Assessment and Management of E&S Risks and Impacts	This PR outlines the process of appraising, managing and monitoring environmental and social issues associated with a project consistent with the European Union environmental impact assessment directive (85/337/EEC as amended).	Applicable and considered for this ESIA
PR 2: Labor and Working Conditions	<p>This PR assures that human resources policies, procedures and standards will meet the following minimum requirements during the life of the Project with regards to labor and working conditions:</p> <ul style="list-style-type: none"> ▪ Establish and maintain a sound worker-management relationship and promote the fair treatment, non-discrimination and equal opportunity of workers; ▪ Promote compliance with any collective agreements to which the client is a party, national labor and employment laws, and the fundamental principles and key regulatory standards embodied in the applicable ILO conventions; and ▪ Protect and promote the health of workers, especially by promoting safe and healthy working conditions. <p>In addition, EBRD requires compliance with applicable EU Occupational Health and Safety requirements and, where such requirements do not exist, applicable IFC Occupational Health and Safety guidelines (IFC PS2).</p>	Applicable and considered for this ESIA
PR 3: Resource Efficiency and Pollution Prevention and Control	<p>Pollution prevention and abatement are key ingredients of a sustainable development agenda and EBRD - financed projects must meet good international practice in this regard. The impacts and issues associated with polluting activities need to be considered in all economic activities, and from effluents and emissions at the facility level, to impacts at a regional and global level where appropriate. This performance requirement assures that all aspects of the Project will meet the following objectives:</p> <ul style="list-style-type: none"> ▪ To avoid or, where avoidance is not possible, to minimize adverse impacts on human health and the environment by avoiding or minimizing pollution directly arising from projects; ▪ To assist clients in identifying project-related opportunities for energy and resource efficiency improvements and waste reduction; and ▪ To promote the reduction of project-related greenhouse gas emissions. 	Applicable and considered for this ESIA
PR 4: Health, Safety and Security	While bringing many positive benefits to local communities, projects can also increase the potential for community exposure to risks and impacts arising from temporary or permanent changes in population; transport of raw and finished materials; construction, operations and decommissioning; accidents, structural failures, and releases of hazardous materials. This performance requirement addresses the project proponent's responsibility to identify and to avoid or minimize the risks and adverse impacts to community health, safety and security.	Applicable and considered for this ESIA
PR 5: Land Acquisition, Restrictions on Land Use and Involuntary Resettlement	Involuntary resettlement refers both to physical and economic displacement as a result of project-related land acquisition. Where involuntary resettlement is unavoidable, appropriate measures to mitigate adverse impacts on displaced persons and host communities should be carefully planned and implemented.	Not applicable, Refer to "Section 9"

EBRD PR	Key Points Relevant to the Project	Applicability
<p>PR 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources</p>	<p>EBRD recognizes the need for the protection and conservation of biodiversity in the context of projects in which it invests. In pursuing these aims, EBRD is guided by and supports the implementation of applicable international law and conventions and applicable EU Directives:</p> <ul style="list-style-type: none"> ▪ To protect and conserve biodiversity; ▪ To avoid, minimize and mitigate impacts on biodiversity and offset significant residual impacts, where appropriate, with the aim of achieving no net loss or a net gain of biodiversity; ▪ To promote the sustainable management and use of natural resources; ▪ To provide for fair and equitable sharing of the benefits from project development and arising out of the utilization of genetic resources; ▪ To strengthen companies’ license to operate, reputation and competitive advantage through best practice management of biodiversity as a business risk and opportunity; and ▪ To foster the development of pro-biodiversity business that offers alternative livelihoods in place of unsustainable exploitation of the natural environment. 	<p>Applicable and considered for this ESIA</p>
<p>PR 7: Indigenous Peoples</p>	<p>Indigenous peoples may be particularly vulnerable to the adverse impacts associated with project development, including risk of impoverishment and loss of identity, culture, and natural resource-based livelihoods. PR 7 seeks to ensure that business activities minimize negative impacts, foster respect for human rights, dignity and culture of indigenous populations, and promote development benefits in culturally appropriate ways.</p>	<p>Not applicable, Refer to “Section 6.2.2”)</p>
<p>PR 8: Cultural Heritage</p>	<p>Cultural heritage is important as a source of valuable historical and scientific information, as an asset for economic and social development, and as an integral part of a people’s cultural identity, practices, and continuity. EBRD requires the protection of cultural heritage from project activities.</p>	<p>Applicable and considered for this ESIA</p>
<p>PR 10: Information Disclosure and Stakeholder Engagement</p>	<p>EBRD considers stakeholder engagement as an essential part of good business practice and corporate citizenship. In particular, effective community engagement is central to the successful management of risks and impacts on communities, as well as central to achieving enhanced community benefits. The specific objectives of this PR are:</p> <ul style="list-style-type: none"> ▪ To identify people or communities that are or could be affected by the Project, as well as other interested parties; ▪ To ensure that such stakeholders are appropriately engaged on environmental and social issues that could potentially affect them through a process of information disclosure and meaningful consultation; and ▪ To maintain a constructive relationship with stake holders on an ongoing basis through meaningful engagement during project implementation. 	<p>Applicable and considered for this ESIA</p>

5.4.4 Asian Development Bank (ADB)

ADB’s Safeguard Policy Statement (SPS) (2009) builds on three previous safeguard policies on the environment, involuntary resettlement and indigenous peoples, bringing them into one policy to more comprehensively address E&S impacts and risks.

The SPS aims to promote sustainability of project outcomes by protecting the environment and people from project’s potential adverse impacts through minimizing, mitigating, and /or compensating for adverse impacts when avoidance is not possible.

In addition, the SPS helps borrowers/clients to strengthen their safeguard systems and develop the capacity to manage E&S risks.

The key requirements under the ADB SPS are summarized in the table below.

Table 12: ADB SPS Requirements

Scope of Application	Requirements	Applicability
Environment	<ul style="list-style-type: none"> - Environmental Assessment - Environmental planning and Management - Information Disclosure, Consultation and Participation - Grievance Redress Mechanism - Monitoring and Reporting - Unanticipated Environmental Impacts - Biodiversity Conservation and Sustainable Natural Resource Management - Pollution Prevention and Abatement - Health and safety - Physical cultural resources 	Applicable and considered for this ESIA
Involuntary Resettlement	<ul style="list-style-type: none"> - Compensation, Assistance, and Benefits for Displaced Persons - Social Impact Assessment - Resettlement Planning - Negotiated Land Acquisition - Information Disclosure - Consultation and Participation - Grievance Redress Mechanism - Monitoring and Reporting - Unanticipated Impacts - Special Considerations for Indigenous Peoples 	Not applicable, Refer to “Section 9”)
Indigenous Peoples	<ul style="list-style-type: none"> - Consultation and Participation - Social Impact Assessment - Indigenous Peoples Planning - Information Disclosure - Grievance Redress Mechanism - Monitoring and Reporting - Unanticipated Impacts 	Not applicable, Refer to “Section 6.2.2”

In addition, the following is also considered applicable in relation to ADB requirements:

- Social Protection Strategy (2001). This strategy defines social protection as a set of policies and programs designed to reduce poverty and vulnerability by promoting efficient labor markets, diminishing people's exposure to risks, and enhancing their capacity to protect themselves against hazards and interruption/loss of income. It spells out the scope of ADB's commitment to develop priority interventions in supporting social assistance and welfare service programs including child protection and micro- and area-based schemes to address poverty, and vulnerability; social insurance programs to cushion risks associated with unemployment, ill-health, disability, work-related injury and old age; and labor market policies and programs designed to generate employment, improve working conditions.

- Gender and Development Policy (1998). The policy focuses on mainstreaming gender considerations into all ADB activities and aims to promote gender equity and improve status of women and treats gender as a cross-cutting themes influencing all social and economic processes.
- Access to Information Policy (2018). The Policy reflects ADB’s ongoing commitment to transparency, accountability, and participation by stakeholders.

5.4.5 Other

There are additional international E&S standards and requirements that were considered throughout the ESIA study. Those are identified in the table below along with their applicability.

Table 13: Other International E&S Requirements and Standards

Requirement	Applicability
IFC Good Practice Note – Addressing Grievances from Project-Affected Communities & IFC Good Practice Manual – Doing Better Business Through Effective Public Consultation and Disclosure	Those identify additional requirements that should be considered and taken into account as part of the planned stakeholder engagement activities as well as the SEP that is provided as a standalone document.
IFC Good Practice Note: A Good Practice Handbook for Companies Doing Business in Emerging Markets	The note identifies key concepts and principles of stakeholder engagement and how to integrate stakeholder engagement with the project cycle. This has been considered for the SEP that is provided as a standalone document.
EBRD and IFC Guidance Note on Worker’s accommodation	identify key issues of concern that should be addressed as well as best practice requirements to be taken into account in relation to worker accommodation.
<ul style="list-style-type: none"> ▪ IFC Good Practice Note on Non-Discrimination and Equal Opportunity ▪ IFC Good Practice Note – Managing Retrenchment ▪ IFC Handbook for Labor and Working Conditions – Measure & Improve Your Labor Standards Performance ▪ Good Practice Note: Managing Risks Associated with Modern Slavery ▪ International Labor Organization (ILO) Conventions. This will include all ILO conventions signed and ratified by the Government of Uzbekistan and at a minimum all ILO conventions covering core labor standards and all ILO conventions covering the basic terms and conditions of employment 	Those are related to workforce management as applicable within the ESIA and associated management plans.
Good Practice Note (GPN) IFC’s Use of Security Forces: Assessing and Managing Risks and Impacts	The handbook provides practical, project-level guidance for companies to better understand and implement the requirements outlined in PS 4. Chapters focus on risk assessment, managing private security, managing the relationship with public security, preparing a security

	management plan, and assessing allegations or incidents related to security personnel.
UN Voluntary Principles on Security and Human Rights	Promotes implementation of a set of principles on providing security for their operations in a manner that respects human rights
Addressing Gender-Based Violence and Harassment (GBVH): Emerging Good Practice for the Private Sector	The note prevents the physical, sexual, emotional and financial harm GBVH causes to individuals, as well as the financial, reputational and legal risks it poses to businesses and investors