International ESIA for an Integrated Renewable Energy Project

180MW Wind Power and Battery Energy Storage System, Tsogttsetsii soum, Mongolia

Chapter 3 Project Description and Alternatives

PREPARED FOR

Net Zero Energy LLC (MCS and URECA)

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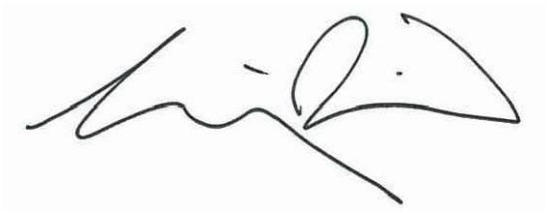
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0747189



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ACRONYMS AND ABBREVIATIONS

Acronyms	Description
AADT	Annual Average Daily Traffic
[redacted]	[redacted]
AIS	Air Insulated Switchgear
ALARP	As Low As Reasonably Practicable
AoI	Area of Influence
APLIC	Avian Powerline Interaction Committee
BESS	Battery Energy Storage System
BMP	Biodiversity Management Plan
BOD	biochemical oxygen demand
CAF	Central Asian Flyway
CAQMP	Construction Air Quality Management Plan
CCRA	Climate Change Risk Assessment
CD	Community Development
CH	Critical Habitat
CHA	Critical Habitat Assessment
CIA	Cumulative Impact Assessment
CIP	Climate Impact Platform
CITES	Convention on International Trade in Endangered Species
CLO	Community Liaison Officer
CMIP6	Coupled Model Intercomparison Project Phase 6
CMS	Conservation of Migratory Species of Wild Animals
CO	Carbon monoxide
COD	chemical oxygen demand
CR	critically endangered
CRM	Citizen's Representative Meeting

Acronyms	Description
CRM	Collision Risk Model
CSMP	Cold Stress Management Plan
DEIA	Detailed Environmental Impact Assessment
DFID	International Development
DSF	Development Support Fund
E&S	Environmental and Social
EAAA	Ecologically Appropriate Area of Analysis
EAAF	East Asian-Australasian Flyway
EBRD	European Bank for Reconstruction and Development
EC	Electrical Conductivity
EEO	Extent of Occurrence
EHS	Environment, Health and Safety
EIA	Environmental Impact Assessment
EN	Endangered
EPC	Engineering Procurement and Construction
EPRP	Emergency Preparedness and Response Plan
ERM	ERM-Hong Kong, Limited
ESA	European Space Agency
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
ESMS	Environment and Social Management System
ETI	Ethical Trading Initiative
FERP	Flood Emergency Response Plan
FFDI	Arthur Forest Fire Danger Index
FGD	focus group discussion
FPIC	Free, Prior and Informed Consent
GBV	Gender-based violence
GCD	Global Climate Database
GHG	Green House Gas
GIIP	good international industry practice
GIS	Geographic Information System
GM	grievance mechanism
GPN	Good Practice Note
GRM	Grievance Redress Mechanism
HCO	Bicarbonate

Acronyms	Description
HSEQ	Health, Safety, Environment, and Quality
HSMP	Heat Stress Management Plan
HSS	Health, Safety and Security
HSSE	Health, Safety, Security and Environment
HVAC	Heating, Ventilation, and Air Conditioning
IA	Impact Assessment
IAQM	Institute of Air Quality Management
IBA	Important Bird and Biodiversity Areas
IBAT	Integrated Biodiversity Assessment Tool
IFC	International Finance Corporation
ILO	International Labour Organisation
IMAR	Inner Mongolia Autonomous Region
IPA	Important Plant Areas
ISMP	Invasive Species Management Plan
IUCN	International Union for Conservation of Nature
KBA	Key Biodiversity Areas
KII	Key Informant Interview
LC	Least Concern
LiDAR	Light Detection and Ranging
LLC	Limited Liability Company
LO	Land Officer
LRP	Livelihood Restoration Plan
LRP	Livelihood Restoration Plan
LVIA	Landscape & Visual Impact Assessment
MCS	Mongolian Consulting Service
MECC	Ministry of Environment and Climate Change
MNS	Mongolian National Standard
MRIA	Mongolian Renewables Industries Association
MRL	Mongolian Red List
MSDS	Material Safety Data Sheet
MW	Mega Watt
MWEA	Mongolian Wind Energy Association
NASA	National Aeronautic Space Administration
NDC	Nationally Determined Contributions
NDC	National Dispatching Centre

Acronyms	Description
NE	not evaluated
NGO	Non-governmental Organization
NH4+	Ammonium
NO2	Nitrogen dioxide
NO2-	Nitrite
NO3-	Nitrate
NOAA	Atmospheric Association
NPTG	National Power Transmission Grid Company
NPTG	National Power Transmission Grid Company
NREC	The National Renewable Energy Centre
NSR	Noise sensitive receiver
NT	Near threatened
NZE	Net Zero Energy LLC
O&M	Operation and Maintenance
OHL	Overhead Transmission Line
OHS	Occupational Health and Safety
OT	Oyu Tolgoi
PA	protected area
PAD	project affected districts
PAPs	Project Affected Persons
PI, mg/L	Phosphate
PM	Particulate matter
POP	persistent organic pollutants
PPA	Power Purchase Agreement
PPE	Personal protective equipment
PS	Performance Standards
RAP	Resettlement Action Plan
RCIA	Rapid Cumulative Impact Assessment
RCS	Real Case Scenario
RILI	rainfall-induced landslide index
RoW	Right of Way
SCADA	Supervisory Control and Data Acquisition
SNH	Scottish Natural Heritage
SO	Social Officer
SO2	Sulphur dioxide

Acronyms	Description
SO4	Sulphate
SPA	Strictly Protected Area
SRTM	Shuttle Radar Topography Mission
STE	Serrated Trailed Edge
TDS	Total Dissolved Solids
TIP	Trafficking in Persons
TL	Transmission Line
TNC	The Nature Conservancy
TOR	Terms of Reference
UNEP	United Nations Environmental Programme
UNFCCC	United Nations Framework Convention on Climate Change
USD	United States dollars
UV	Ultra-violet
VEC	Valued Environmental and Social Components
VP	Vantage Point
VU	Vulnerable
WBG	World Bank Group
WBGT	Wet Bulb Globe Temperature
WCS	Worst Case Scenario
WCS	Wildlife Conservation Society
WHO	World Health Organisation
WPF	Wind Power Farm
WPFW	West Pacific Flyway
WRI	World Resource Institute
WSDI	Warm spell duration index
WTG	Wind Turbine Generator
WWF	World Wide Fund for Nature

3. PROJECT DESCRIPTION AND ALTERNATIVES

3.1 PROJECT LOCATION

The WTG Area and OHL of the Project is located in Umnugovi (also written Ömnögovi, and Mongolian: Өмнөговь) Province in southern Mongolia, relatively close (about 130 km) to the border with China. It is in the district (Mongolian: soum) of Tsogttsetsii (Mongolian: Цогтцэций) and is close (~60 km) to the Oyu Tolgoi Mine to which the transmission line will connect.

3.2 PROJECT COMPONENTS

The Project components that will be assessed during the ESIA process are as follow:

- 29 Wind Turbine Generators (WTG);
- Substation consisting of 2x120 MVA power transformers located near the WTG area and the substation will be equipped with a Control Room;
- A Battery Energy Storage System of 50MW and 100 MWh (BESS);
- A ~65 km double-circuit 220 kV Overhead Transmission Line (OHL) connecting in a southeast direction from the Wind Farm Site to the Oyu Tolgoi Mine's central substation (Option 1) or Zes Oyu 220 kV switching station (Option 2);
- An ~30.9 km improved/unpaved road connecting the existing heavy duty coal transport Road to the WTG Area;
- About ~56 km of internal roads within the WTG Area connecting the different facilities;
- An OHL Access Road of total length about 62.2 km which will support construction and operation of OHL;
- Temporary facilities including workers' accommodation camp, offices, laydown (storage and stockpile) areas, concrete batching plant, onsite solar power generation area (Photo Voltaic array and BESS), and turbine installation areas for WTG assembly.

Project components are shown in *Figure 3-1* and further discussed in detail in the following sections.

For ease of readability and clarity, a list of definitions used in this report is provided as follows:

- 'Project' is used to refer collectively to the facilities listed above;
- 'WTG Area' refers to the area for which the Project obtained a Land Possession and Land Possession Certificate for the installation of the WTGs; and
- 'Project Site' refers to the land area that will be permanently occupied by the Project and its facilities.

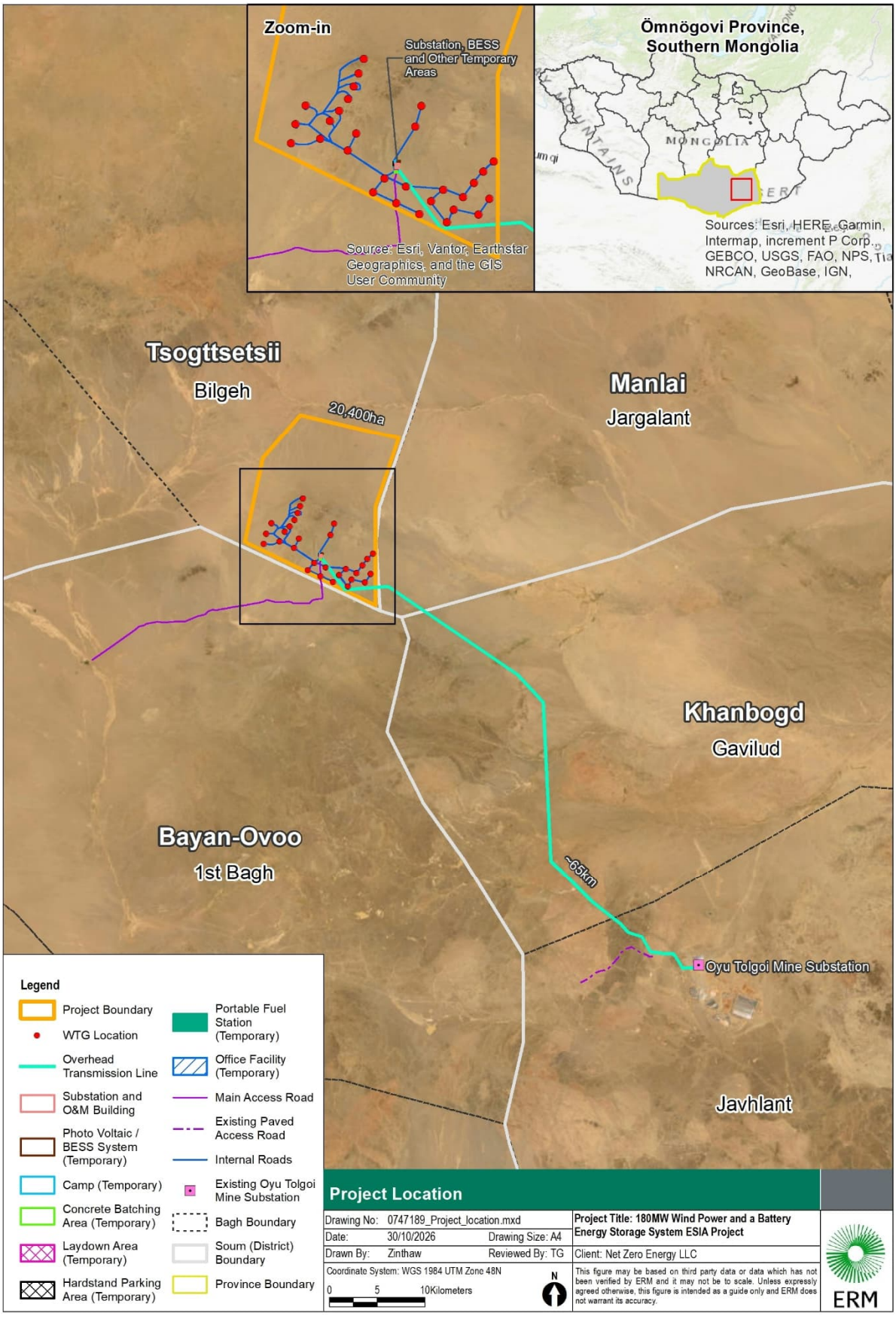


FIGURE 3-1: PROJECT LOCATION

3.2.1 WIND TURBINE LAYOUT

The Project is planning the installation of 29 WTGs of model [redacted] supplied by [redacted] in China. The generator has a technically possible output of 6.25 MW, which for the Project will be controlled to have an output of 180 MW. This output will be produced by Supervisory Control and Data Acquisition (SCADA) regulation for the whole wind farm. This will allow to control the output of the 29 WTGs to comprise 180 MW.

The WTGs are expected to be grouped by several units to create several groups for connection to the 35 kV switchgear of the wind farm.

The location of the 29 WTGs is presented in the in *Table 3-1* and *Figure 3-2*.

TABLE 3-1: LOCATIONS OF WTGS

WTG Name	WTG Number #	Longitude	Latitude	Elevation (meters above sea level)
2 point	1	43.4197	106.3423	1456
4 point	2*	43.4631	106.3770	1490
5 point	3*	43.4528	106.3725	1488
T25	4	43.4343	106.4267	1425
T26	5	43.4294	106.4193	1432
T28	6	43.4103	106.3983	1426
T29	7	43.4040	106.3934	1417
T1	8	43.4205	106.3912	1434
T4	9	43.4801	106.3336	1538
T5	10	43.4732	106.3295	1553
T6	11	43.4666	106.3257	1562
T7	12	43.4613	106.3197	1536
T8	13	43.4553	106.3131	1534
T9	14	43.4473	106.3061	1482
T10	15	43.4411	106.3250	1486
T11	16*	43.4498	106.3313	1511
T2	17	43.4454	106.2856	1450
T3	18	43.4549	106.2891	1464
T12	19	43.4644	106.2961	1482
T13	20	43.4147	106.3826	1434
T14	21	43.4083	106.3743	1426
T15	22	43.4873	106.3376	1525
T16	23	43.4267	106.3505	1460
T17	24	43.4223	106.3653	1447

WTG Name	WTG Number #	Longitude	Latitude	Elevation (meters above sea level)
T18	25	43.4144	106.3575	1438
T19	26	43.4237	106.4129	1433
T20	27	43.4165	106.4051	1431
T21	28*	43.4155	106.4232	1416
T22	29*	43.4077	106.4156	1417

Note *: WTG is anticipated not included in initial phase including associated internal access road (refer *Section 3.6.6*)

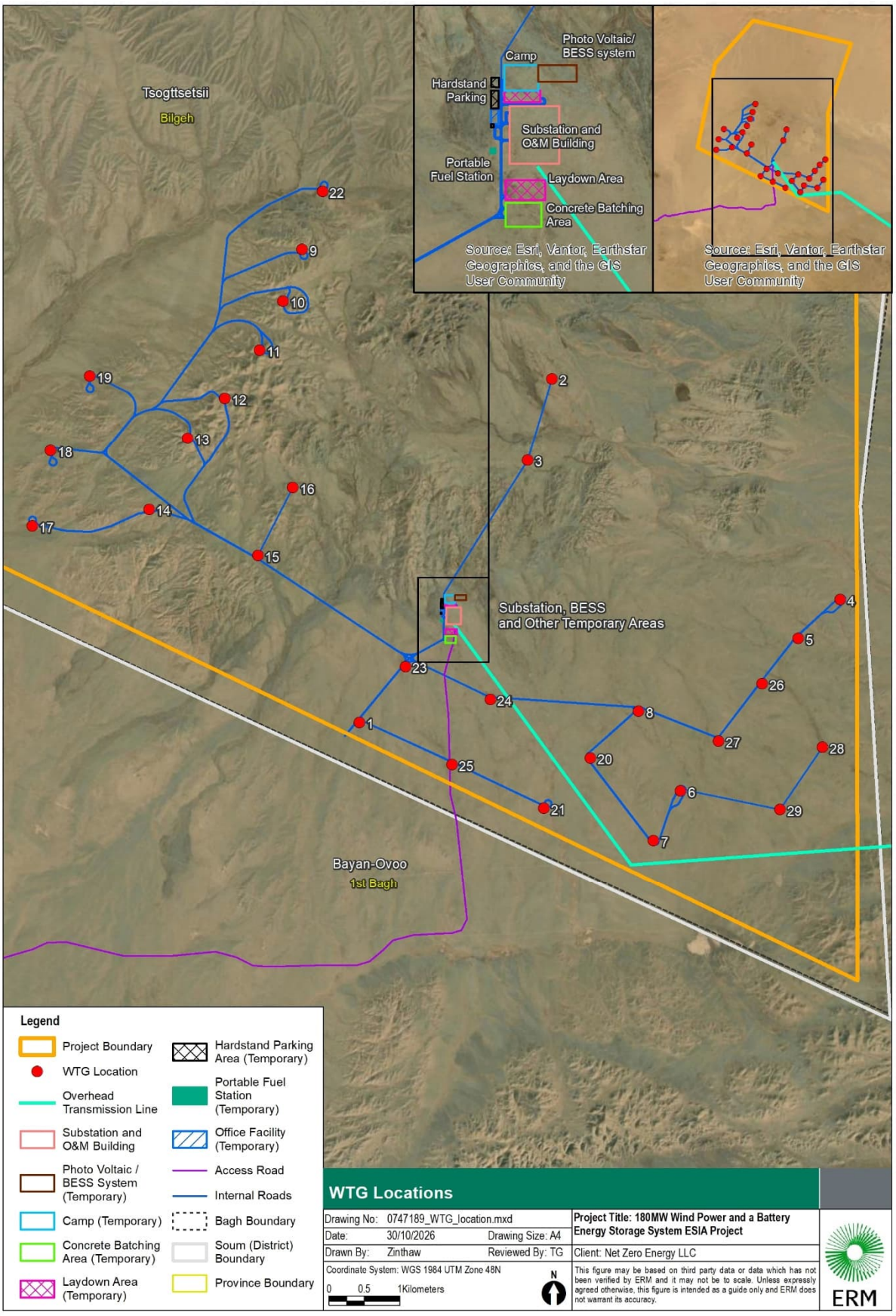


FIGURE 3-2: WTG LOCATIONS

3.2.2 SUBSTATION, BATTERY ENERGY STORAGE SYSTEM (BESS) AND OVERHEAD TRANSMISSION LINE (OHL)

The Project includes the construction of an internal substation to convert the electricity generated by the WTGs to a voltage suitable for transmission to the Oyu Tolgoi substation and which is compatible with the Inner Mongolia Autonomous Region (IMAR) West power system. The Project will operate in parallel with the unified grid of the IMAR, and it will meet the technical requirements, relay protection, and regulation standards set by the company. Additionally, the project will comply with the energy standards and emergency operation regulations in Mongolia. The Substation will comprise of 2x120 MVA power transformers and connected to the existing Oyu Tolgoi Mine's central substation via a new OHL. In addition, a Project-dedicated Battery Energy Storage System (BESS) will be included to capture and store surplus energy generated by wind turbines.

3.3 PROJECT SCHEDULE

The preliminary Project plan is to start the construction works in Q4 of 2026, start Early Energy Generation in Q3 of 2028, and achieve the Commercial Operation Date in Q1 of 2029. Construction activities at the WTG Area will take about 26 months. For certain works, no construction activities are planned during the period from mid-November to early-March as weather conditions may affect some activities. Key Project Schedule is provided in *Figure 3-3*.

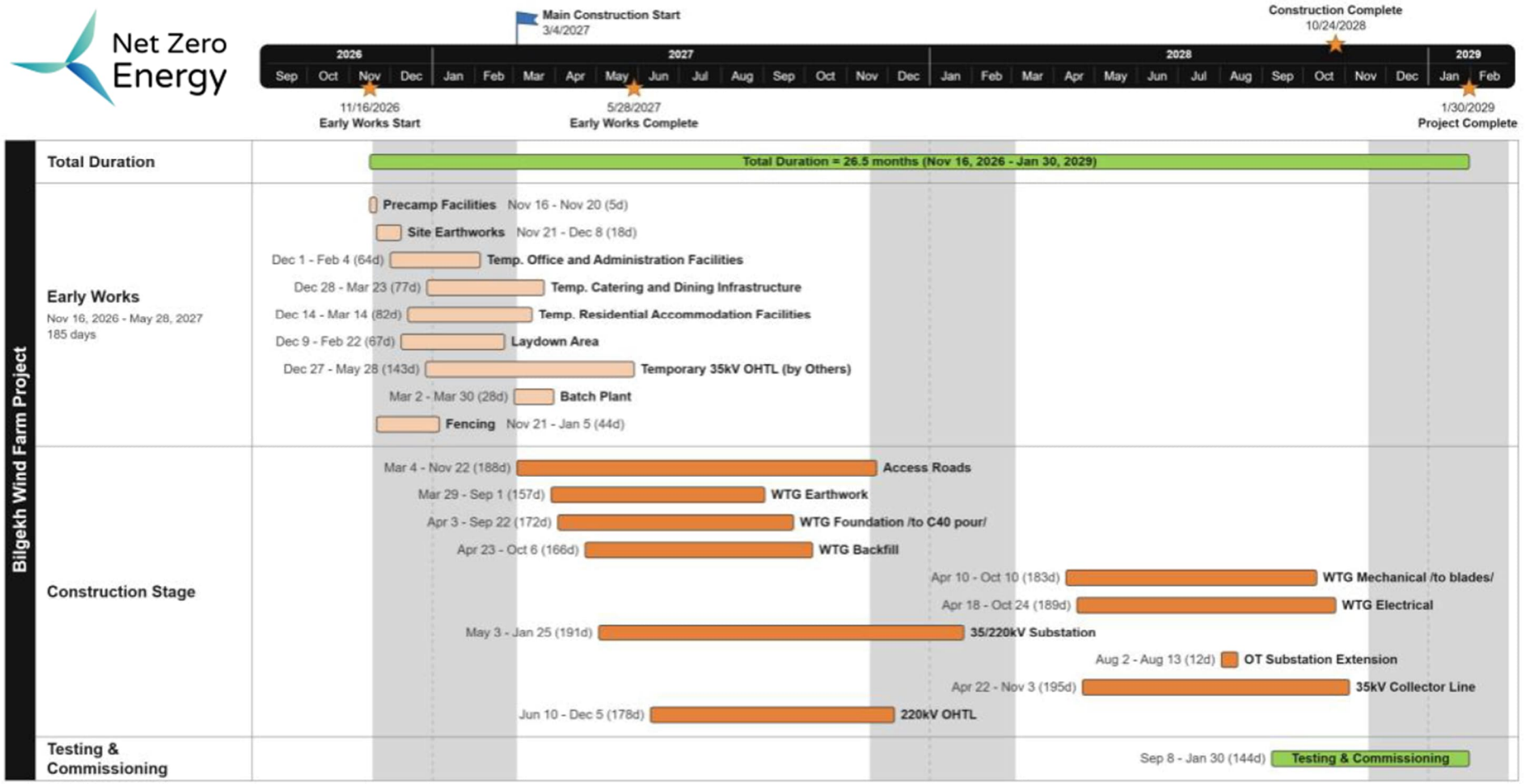


FIGURE 3-3: KEY PROJECT SCHEDULE

3.3.1 PERMANENT FACILITIES

3.3.1.1 WIND TURBINE GENERATORS

The Project will utilise [redacted]WTG with a generator that has a technically possible maximum output of 6.25 MW. The generator will be controlled by SCADA system for the whole wind farm This will allow to control the output of the 29 WTGs to comprise 180 MW.

The selection of this WTG model was based on a series of techno-economic factors:

- Reliability, experience and track record of the WTG manufacturer;
- Availability of the product that can be manufactured in nearby countries;
- Compatibility with site layout, transportation capacity and erection;
- Compatibility with environmental characteristics of the area, i.e., extreme low temperature and dust; and
- Cost-effectiveness.

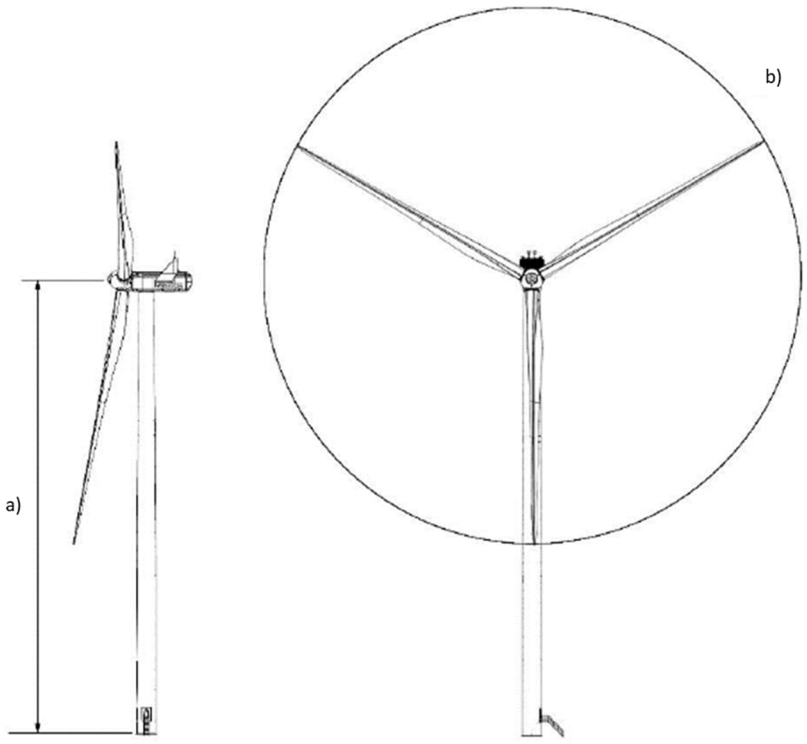
Details of the current selected design (as of August 2025) are presented *Table 3-2*.

TABLE 3-2: CURRENT WTG DESIGN DETAILS

Characteristic	Details
WTG Model	[redacted]
Number	[redacted]
Rated capacity, kW	[redacted]
Rotor diameter	[redacted]
Blade length, m	[redacted]
Hub height	[redacted]
WTG manufacturer	[redacted]
WTG type (horizontal / vertical axis)	[redacted]
Number of blades	[redacted]
Blade control (pitch/stall)	[redacted]
Speed control (fixed, two-speed, variable)	[redacted]
Generator type and rating, kW	[redacted]
Frequency converter type and rating (kVA)	[redacted]
Transformer ratio and rating (kVA)	[redacted]
Foundation	[redacted]

Characteristic	Details
	[redacted]
Wind Speed to Achieve Rated Power	[redacted]
Start-up Wind Speed	[redacted]
Cut-out Wind Speed	[redacted]
Maximum Wind Speed (10-minute average)	[redacted]
Normal Operating Temperature	[redacted]
Allowed Temperature Range	[redacted]
Service Life	[redacted]

Sources: Feasibility study, DEIA. Updated by NZE.



a) Hub height 110m; b) Rotor diameter 182 m.

FIGURE 3-4: CURRENT DESIGN OF WIND TURBINE MODEL [redacted]

The selected wind turbine model includes safety mechanism including ability for rotor blade to turn parallel to the wind (also known as rotor blade feathering) to stop rotation (i.e. keeps rotation under 1 RPM) during high wind or emergencies and allows for on-demand shut down or curtailment.

Placement and specifications for aviation obstruction warning lighting at the 110m hub of WTG will be in accordance with Mongolian Civil Aviation Authority (MCAA) requirements.

Each WTG will have permanent hardstand area of 60 x 45 m in dimension and foundation of 300 m^2. In this way, the area of hardstand due to construction of 29 WTGs will amount to about 6.9 ha with foundations occupying 1 ha.

3.3.1.2 SUBSTATION

The location of the substation is shown in *Figure 3-2.* The 220/35 kV substation for the wind farm will have two (2) transformers with a capacity of 120 MVA each. A total of 19 sections are planned for the 35 kV input from the wind turbines, the battery storage, and internal consumption. Two outputs will be connected to the 220/35 kV 120 MVA transformers, six inputs will be grouped into four (4) bundles for connection to 29 wind turbines, one input will be connected to the 100 MWh battery storage, one will be reserved for reactive power regulation (SVC connection), and one will be connected to internal consumption. The load current on the 35 kV side of the main transformer is calculated at 400 A, with a resistance value of RN=UN/√3Id=50.5Ω.

The substation will connect to the Oyu Tolgoi mine's central substation via a double-circuit ~65 km long 220kV overhead transmission line from the 220kV outdoor switchgear. An SVC assembly is planned to be installed on the 35kV side of the substation for reactive power regulation. The response time of the reactive power compensation equipment should be less than 30 milliseconds.

This project will include a battery storage system with a capacity of 50 MW and 100 MWh, which will be completed simultaneously with the construction and assembly of the substation.

The substation will occupy an area of ~5 ha. The substation will be delimited by a wire fence and will include:

- Control Building;
- BESS
- Outdoor Air Insulated Switchgear (AIS);
- Transformers;
- Maintenance area;
- Hazardous material storage area;
- Sewage tank;
- Trash bins;
- Muster point; and
- Security post.

3.3.1.3 BESS

The battery storage system to capture, store, and surplus energy generated by wind turbines will consist of ten outdoor [redacted] containerized units, [redacted]. The BESS is designed with low-noise technology and for operation under harsh outdoor environmental conditions and suitability for wide operating temperature range that occur at the Project site. The BESS will use Lithium Iron

Phosphate Energy Storage System (LFP ESS) battery cell technology[1] [redacted] Each of the ten units is rated at 10 MWh with a 0.5C discharge rate to deliver a combined system capacity of 100 MWh and a total rated power supply of 50 MW. The BESS will be located within the Substation and will be completed simultaneously with the construction and assembly of the substation. The Substation location, which will include the BESS is shown in *Figure 3-2*. A visualization of a BESS unit is shown *Figure 3-6*. *Figure 3-5* shows the layout of containerized BESS units (in purple) and associated Power Conversion Units (in green) within the BESS area of the substation.

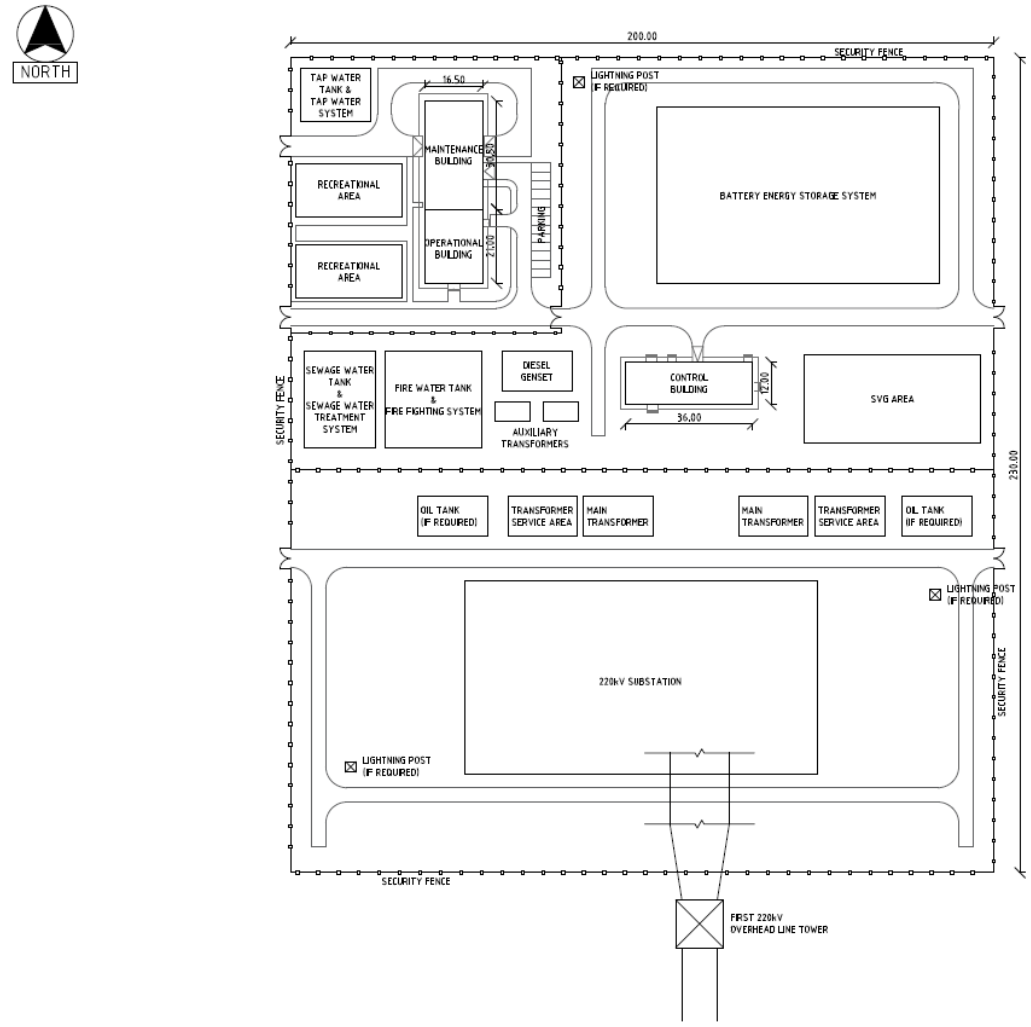
The BESS will be located on an impermeable, bunded and raised surface to prevent damage from potential flooding and potential leakage of liquid substances.

The design and manufacture of the battery equipment will be in accordance with good practice to meet baseline safety criteria including UL 1642 for individual battery cells, UL 1973 for battery racks, UL 8540 for complete ESS (battery, Power Conversion System and enclosure) informed by UL9540A fire propagation and gas testing.

The installation and siting of the BESS at the Project site will be performed in accordance with good practice recommendations outlined in International Fire Code Standard (IFC 2021) and in NFPA 855, Standard for the Installation of the Energy Storage Systems. The designated use of the BESS area is restricted solely to electrochemical energy storage, energy generation and other operations related to the electrical grid. Occupancy of the designated area housing the BESS will be restricted to personal engaged in the operation, maintenance, testing and repair of the BESS and other energy systems and no other occupancy types will be allowed.

[redacted]

[1] LFP is currently the best practice/preferred lithium-ion chemistry for reduced fire risk due to intrinsic chemical stability, higher thermal runaway thresholds, and slower fire propagation characteristics compared to other battery technologies.



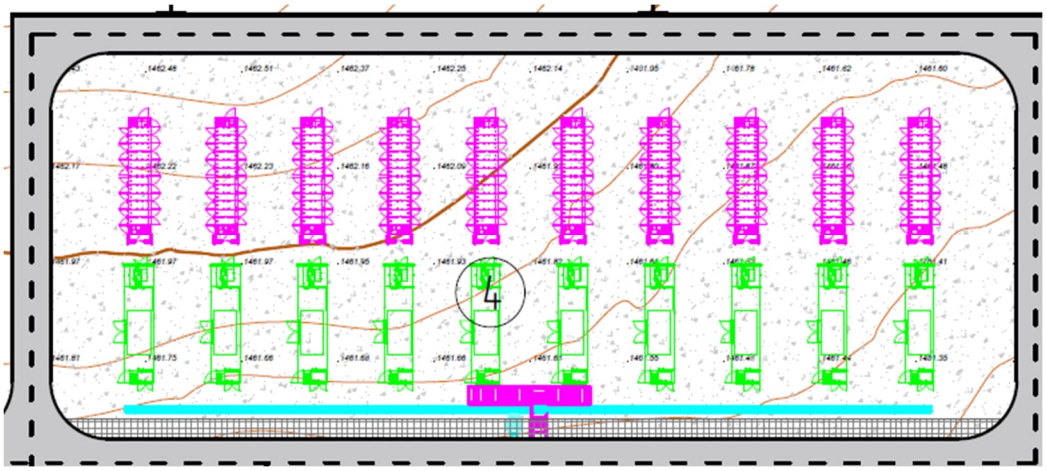


FIGURE 3-5: LAYOUT DRAWING OF SUBSTATION (UPPER) AND ZOOM-IN VIEW OF BESS UNIT LAYOUT (LOWER)

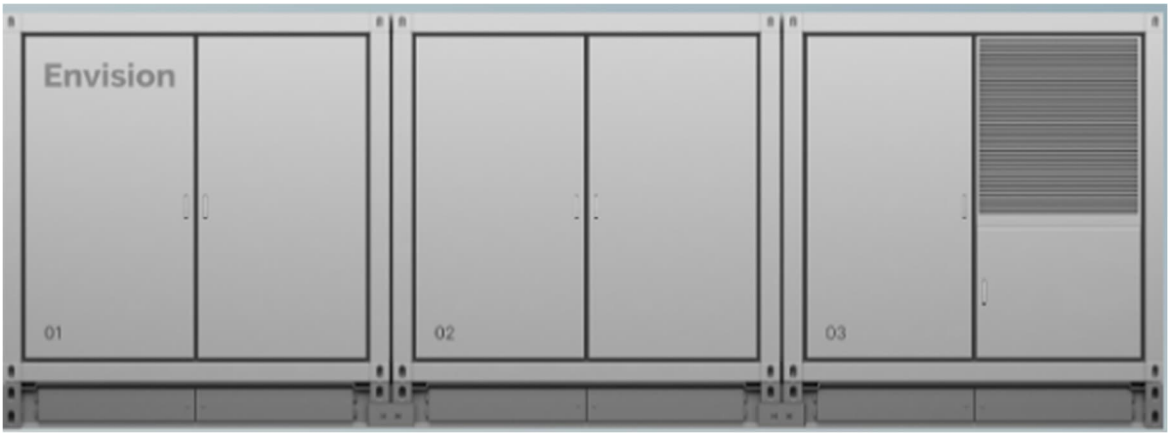


FIGURE 3-6: SIDE VIEW OF CONTAINERIZED BESS UNIT MODEL [redacted]

3.3.1.4 OVERHEAD LINE (OHL)

The substation will connect to the Oyu Tolgoi mine's central substation[2] or Zes Oyu switching station via a double-circuit ~65 km long 220 kV OHL from the 220kV outdoor switchgear. An SVC assembly is planned to be installed on the 35kV side of the substation for reactive power regulation.

The OHL will be supported by about 228 towers, of which about 17 towers are expected to be within the Oyu Tolgoi mining area[3]. Towers will have a height of 27-35 m. Towers will be made of Grade C steel. The right-of way width[4] will be 50 m. Design of the OHL will include installation of bird diverters. The footprint of towers will be 20 x 20m occupying 9.1 ha in total.

TABLE 3-3: CURRENT DESIGN OF OHL

Characteristic	Details
Length	~65 km 220 kV OHL
Type	Overhead
No of circuits	Double
Diameter (mm)	2 x JL/G1A-240/30
Distance between wires (m)	4.5 m
Sheath for cable	n/a
Installation	n/a
Tower height (m) [range]	27 to 35

[2] The reader should not confuse the existing Oyu Tolgoi Mine Central Substation with the existing Mongolian Central Energy System (CES) substation which is located about 9 km north of the mine.
[3] Final alignment of the OHL through land within the Oyu Tolgoi mining area will be confirmed with the off-taker (i.e. OT mine operator).
[4] The Mongolian Law on Energy of 2001 (the Law of Energy) and Mongolian Government Resolution No. 97 of 18 March 2020, stipulates the establishment of protection zones or Right of Way (RoW) for transmission lines. Articles 7.3 and 29.1.7 of the Law of Energy refer to the protection zone, and Article 33 (full article) is entitled "Power transmission network protection zone". The Energy Law does not specify the width of the ROW, however, authorises governors of aimags and soums to set the RoW in accordance with safety rules for lines and determined RoW with by the Government resolution. The requirements for 220 kV lines include RoW of 25m (both sides of outer line) in unpopulated areas.

It is assumed that tension towers and suspension towers will be of typical design similar to the existing transmission line near the Project Area.



Source: NZE

FIGURE 3-7: OHL TOWER

The OHL will run approximately 62.2 km from the step-up transformer to the OT site area. From there, an approximately 3 km transmission line will be constructed to connect to the OT central substation, bringing the total OHL length to approximately 65 km. The alignment of the OHL within 4 to 6 km of the receiving substation where it will cross through the Oyu Tolgoi mining requires finalisation in liaison with the Oyu Tolgoi mine operator.

3.3.1.5 ACCESS ROAD

At the north of the Project Area, an Access Road, serving as the Project's main access road, will be about 30.9 km long and will connect the existing Heavy Duty Coal Transport Road to the WTG Area. The Access Road route will mostly follow an existing earth road. The average width of the road, which will be unpaved, is expected to be eight (8) m wide. At the south of the Project Area, an existing 9.3 km long paved road, which is designated for Oyu Tolgoi heavy truck traffic, will be used for access from the Heavy Duty Coal Transport Road to the southern end of the OHL.

A map showing the Heavy Duty Coal Transport Road and existing unpaved roads and tracks including Tsogttesii-Khanbogd tertiary road are presented in *Figure 3-8*.

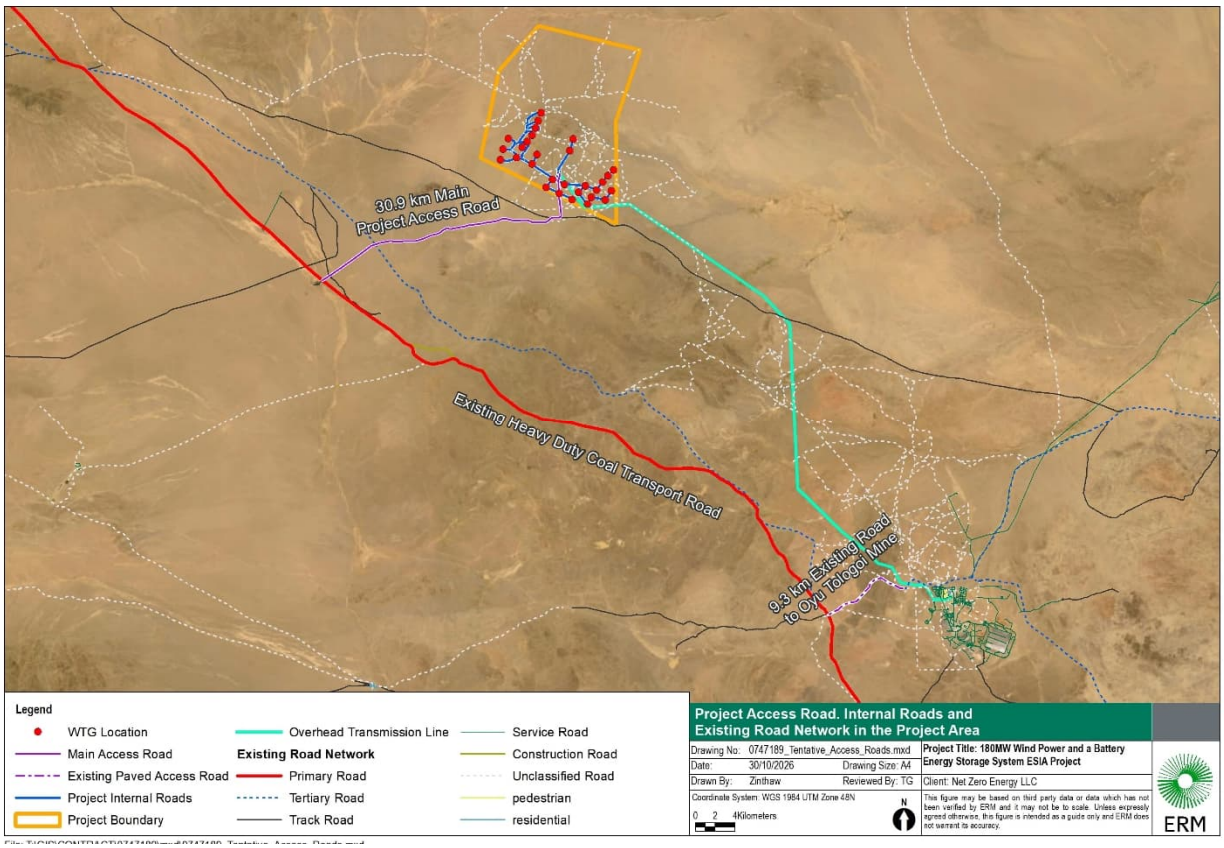


FIGURE 3-8: PROJECT ACCESS ROAD, INTERNAL ROADS AND EXISTING ROAD NETWORK IN THE PROJECT AREA

3.3.1.6 INTERNAL ROAD SYSTEM

Internal roads will be established to connect the WTGs and the Substation and BESS. It is expected about 56.1 km of roads will be created. The roads will be unpaved and six (6) m wide. In total, internal access road for installation of 29 WTGs, the area occupied by internal access roads amounts to 33.66 ha[5].

3.3.1.7 OHL ACCESS ROAD

To support the construction and operation of OHL, an OHL Access Road of about 62.2 km will be established between the Project substation and Oyu Tolgoi Mine, connecting the substation (*Figure 3-9*). The OHL Access Road is divided into three (3) main sections, namely:

- New Unpaved Section: Step-up Substation to OHL Access Road ~4 km;
- Existing Section: 220kV OHL access road ~33.1 km; and
- New Unpaved Section: that follows OHL ~25.1 km.

The construction method involves grading and levelling the existing track using a grader or dozer to smooth ruts and remove obstacles, then widening the track to accommodate heavy transport. The road width is planned to be four (4) m. In total, the OHL Access Road, including

[5] 29.46 ha for initial installation of 24 WTGs

both the existing alignment and the sections to be newly constructed, extends approximately 62.2 km, resulting in a total disturbed land area of approximately 24.8 ha[6].

[6] Includes 13.3 ha along the existing section.

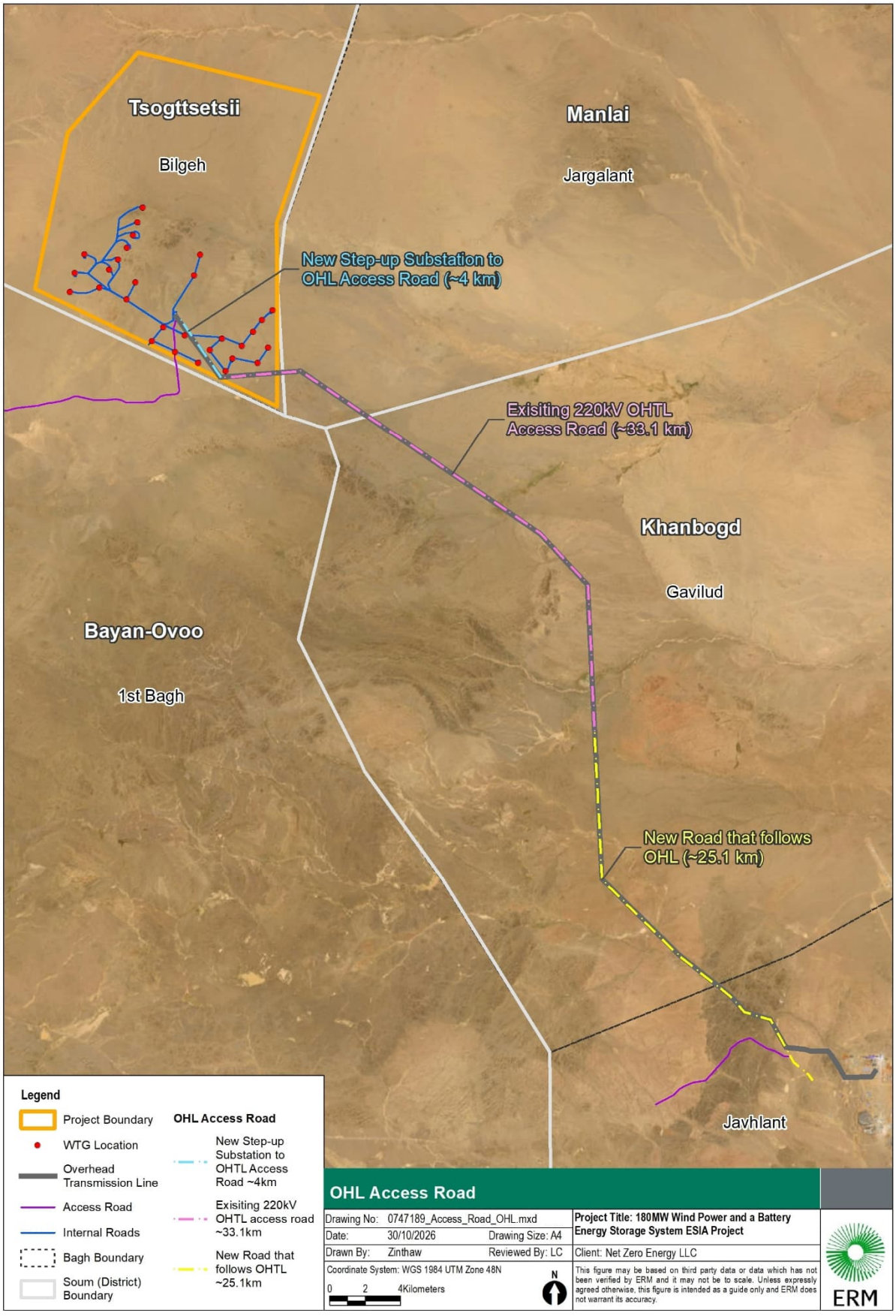


FIGURE 3-9: LOCATION OF OHL ACCESS ROAD

TABLE 3-4: EXPECTED TRAFFIC ON OHL ACCESS ROAD DURING CONSTRUCTION PHASE

No.	Vehicle / plant	Purpose	Origin / route	Trips/day
1	Excavator	Foundation excavation	Resident at workfront	At workfront
2	Backhoe loader	Trimming, material handling	Resident at workfront	At workfront
3	Vibratory roller	Backfill compaction	Resident at workfront	At workfront
4	Telehandler	Laydown and element handling	Resident at laydown	At workfront
5	Mobile crane (all-terrain)	Precast element placement, tower erection	Along corridor	1.0
6	Truck-mounted crane	Steel handling, miscellaneous lifts	Along corridor	1.0
7	Semi-trailer - precast elements	Precast leg foundations	UB > Tsogtsetsii > corridor	0.5
8	Semi-trailer - tower steel	Lattice tower steel	UB > Tsogtsetsii > corridor	0.5
9	Flatbed truck	Hardware, insulators, grout, consumables	UB > Tsogtsetsii > corridor	0.2
10	Howo truck	Imported select fill	Quarry, 100 km+	2.0
11	Water truck	Dust suppression and compaction water	Local source	1.0
13	Light vehicle	Crew, survey, QA density testing	Along corridor	2.0
14	Pickup truck	Small material delivery	Along corridor	2.0
15	Fuel truck	Diesel resupply to corridor and plant	Tsogtsetsii > corridor	1.0
16	Mobile service truck	Plant maintenance	Along corridor	0.2
17	Lowbed / float trailer	Plant mobilisation, over-width loads	UB and local	0.2

During the construction phase, dust suppression along the OHL Access Road is estimated at 3,731 m^3. Since the line is a mobile spread, only part of the 62.5 km right-of-way is trafficked at any given time. This estimate assumes a 10 km active front on the four (4) m-wide track, watered two days per week at 1.5 L/m^2/day, applied only during the OHL construction window and scaled using the same seasonal intensity profile as the site roads.

No dust suppression is expected during ongoing operation, as access is limited to one (1) light vehicle making one (1) trip per month for inspection, and three (3) trips per year for scheduled service.

3.3.2 ANCILLARY FACILITIES

3.3.2.1 WORKERS ACCOMMODATION CAMP AND OFFICE FACILITY

A temporary workers accommodation camp and separate temporary office facility (living and office areas) will be established for use during the construction period with location provided in *Figure 3-1* and *Figure 3-2*. Together, the temporary camp, temporary offices and associated hardstand areas for parking will occupy 2.1 ha. In addition, rented accommodation at Tsogttsetsii may be used during the construction period. There will be no temporary mobile accommodation camps located along the OHL corridor. It is assumed that temporary workers accommodation will be able to accommodate 250-300 workers at peak time. At the time of writing, it is not possible to define the nationality of the workers or the EPC contractors that will be involved. Therefore, it is not possible to estimate the percentage of foreign workers. The facility will include, at a minimum, accommodation, shower, changing rooms, kitchen, recreational facilities and infirmary. Accommodation will be heated. Given the remoteness, water supply will be from licenced water suppliers from Tsogttsetsii (*Section 3.4.2.3*) and power supply will be from onsite renewable energy generation (refer to *Section 3.4.2.4*).

3.3.2.2 LAYDOWN AREAS

Two temporary laydown areas for storage will be established with locations provided in *Figure 3-1* and *Figure 3-2*. Facilities such as warehouses, warehouse office, laydown yards and preparation areas will be located within these areas. The laydown areas will occupy 2.1 ha.

3.3.2.3 CONCRETE BATCHING PLANT

A temporary concrete batching plant will be established at the WTG Area with location provided in *Figure 3-2*. The temporary concrete batching plant site will occupy 1.5 ha. It is assumed about 700m^3 of concrete would be required per WTG foundation. A concrete batching plant with concrete mixing capacity of 40 m^3/hour produces enough concrete to allow casting of the foundation of one WTG per day. It is assumed that concrete for the OHL anchor poles and suspension tower will be purchased from existing facilities and not prepared on site. The source of the aggregates may be located within the WTG Area or within few kilometres from the WTG area boundaries. Aggregate materials will be sourced from existing quarries depending on their availability. Water requirements for the concrete batching plant are planned to be met by using water that is trucked in by water tankers and sourced from the municipal water supply at the Soum centre.

Overall, the temporary laydown, temporary concrete batching area, temporary workers' accommodation camp, and temporary offices will cover a 6.75 hectare site.

3.3.2.4 PHOTO VOLTAIC AND BESS SYSTEM

Temporary power for the construction phase will include a temporary 650 kW photovoltaic (PV) array and battery energy storage system (BESS) with location provided in *Figure 3-2*. The PV and BESS system within a 1.1 ha area will be fenced and access restricted to personal engaged in the operation, maintenance, testing and repair of the PV and BESS system and BESS installed on bunded impermeable surface. It is assumed that the PV areas will be cleared of vegetation but not concreted.

3.3.2.5 CRANE INSTALLATION AREAS

Temporary crane installation areas comprising progressive crane pads and turbine laydown areas, will have dimensions of 60m x 150m. Within this area, an area of 60 x 45m of hardstand will be installed. Each WTG foundation will have an area of 300m^2. Example of crane installation area at each WTG is provided in *Figure 3-10*. For the installation of 29 WTGs, the crane installation areas will temporarily occupy ~18.3 hectares of which ~6.9 ha will be occupied by permanent hardstand as well as ~1 ha for the WTG foundations on completion of construction activities[7].

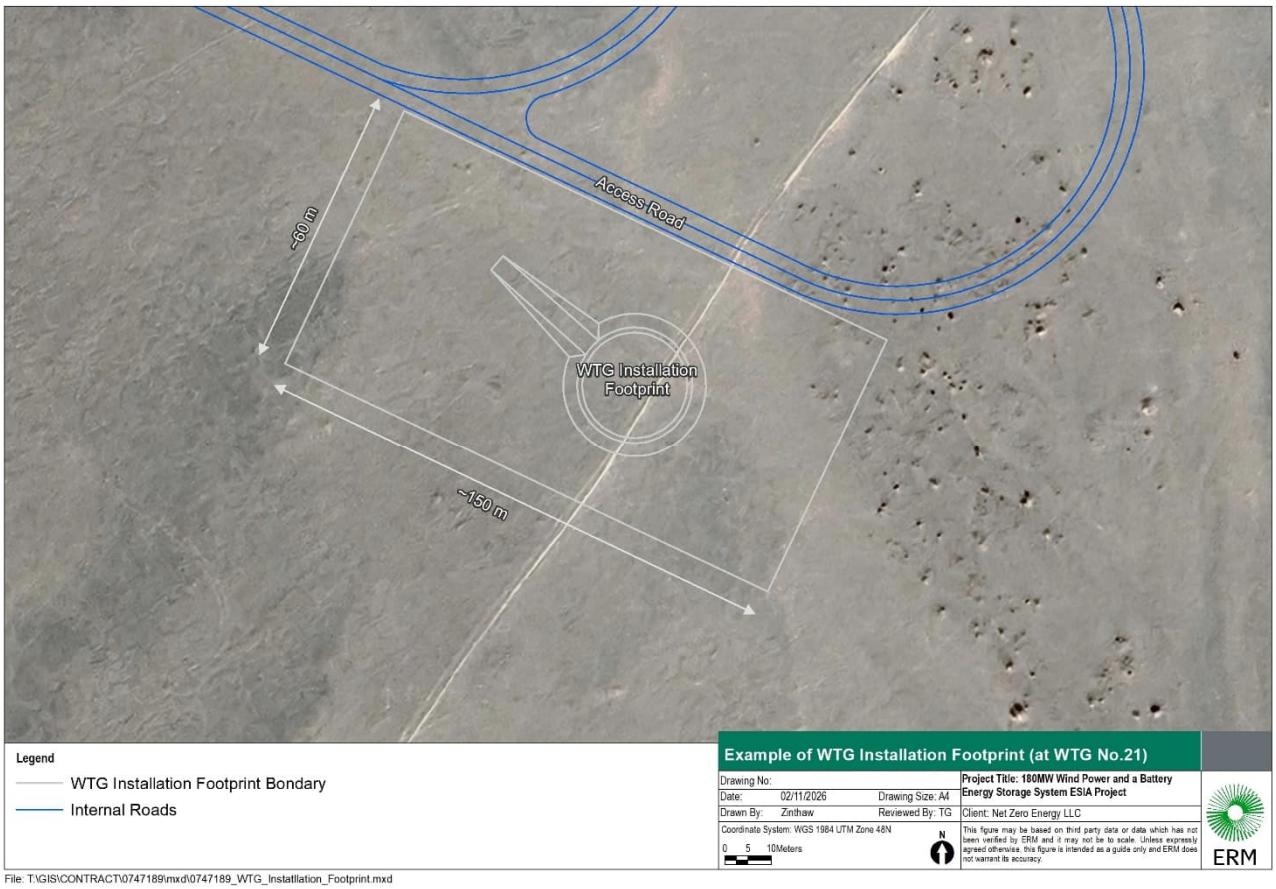


FIGURE 3-10: EXAMPLE OF WTG INSTALLATION FOOTPRINT

3.3.2.6 QUARRY SITES

Aggregate materials will be sourced from nearby quarry sites by the supplier which will be defined later.

3.3.2.7 SPOIL DISPOSAL SITES

At the current design stage, a spoil disposal site has not been designated. Given the topography of the WTG Area and OHL route, it is expected that limited excavation will occur, and the volume of material will be re-used in the Project Site.

[7] For initial installation of 24 WTGs, the crane installation areas will temporarily occupy ~15.1 hectares of which ~5.7 ha will be occupied by permanent hardstand and 0.8 ha for foundations.

3.3.3 OTHER COMPONENTS

Other components of the Project include:

- Wind monitoring system with meteorological sensors (speed, wind direction);
- Anti-lightning system;
- Earthing system;
- Communication system;
- Electricity metering system; and
- Fire protection equipment for fire prevention.

3.4 PROJECT ACTIVITIES

3.4.1 PRE-CONSTRUCTION PHASE

The pre-construction phase of the Project will involve the following activities:

- Land acquisition: Land possession by coordinating with local authorities (local Governors) to complete land acquisition process;
- Design: preparation of the detailed design and layout of wind turbines within the Project Site and other infrastructure (substation, OHL, Control Building, auxiliary works, etc.);
- Project Area preparation: this is expected to include Engineering Procurement and Construction (EPC) contractor mobilisation, waste disposal area, construction of the worker's accommodation facilities, and storage areas; and
- Permitting process: obtainment of all necessary permits and authorizations prior to construction.

3.4.2 CONSTRUCTION PHASE

The construction phase will take up to about 17 months depending on the agreed start date with Oyu Tolgoi (off-taker), and will involve the following activities:

- Workforce mobilization and presence: this will include Engineering Procurement and Construction (EPC) contractor mobilization, construction of the worker's accommodation facilities, and materials storage areas;
- Land preparation (site clearance, excavation, and ground levelling), fencing, and civil works;
- Construction of Access Road;
- Construction of internal roads;
- Construction of WTGs foundations, Substation, BESS and Control Building;
- Construction of the OHL;
- Transportation of WTGs, construction material and machines;
- Extension of the connecting substation (Option 1 and 2);
- Installation of WTGs and internal cabling;
- Installation of the communication system and Supervisory Control and Data Acquisition (SCADA) system;

- Construction and installation of water supply and drainage system, power supply system and fences; and
- Completion of internal electrical connections.

Service providers for necessary construction materials located near the project site are presented in *Table 3-5*.

TABLE 3-5: NECESSARY CONSTRUCTION MATERIALS AND SOURCE LOCATION

Construction Materials	Location	Distance to site (km)	Remarks
Concrete mixture	A (mobile) batching plant will be located in close vicinity of the project site	0.5	Available to supply with no interruption
Cement	From Ulaanbaatar	500	By truck
Gravel	From existing third-party quarries or from new quarry site in proximity to the project site	5 -10	By truck. One time transport of 40 to 60 tonnes
Sand	From existing third-party quarries by the concrete supplier	40	By truck
Reinforcement steel (rebar)	From China	610	By truck
Water	From water supply company in Tsogttsetsii	70	By water tanker truck

Major construction equipment for construction activities is presented in *Table 3-6*.

TABLE 3-6: MAJOR CONSTRUCTION EQUIPMENT

	Machinery	Specifications	Unit	Quantity	Note
1	1000t crawler crane	1000t	Set	3	
2	300t hydraulic truck mounted crane	300t	Set	3	
3	Excavator	2m^3	Set	6	
4	Loader	2m^3	Set	2	
5	Concrete transport mixer	10 m^3	Vehicle	10	
6	Concrete pump		Set	5	
7	Immersion vibrator	CZ-25/35	Piece	12	2 backups
8	Dump truck	20t	Vehicle	6	
9	Motor truck	15t	Vehicle	2	
10	Internal combustion roller	15t	Vehicle	1	
11	Water transporting vehicle	8 m^3	Vehicle	1	

	Machinery	Specifications	Unit	Quantity	Note
12	Sprinkling truck		Vehicle	1	
13	Flat-bed transport vehicle	SSG840	Set	3	
14	Diesel generator	100 kW	Set	3	
15	Steel bar straightener	Within Φ14	Set	1	
16	Steel bar cutter	Within Φ40	Set	2	
17	Steel bar bender	Within Φ40	Set	2	
18	Submerged pump		Set	3	

3.4.2.1 WIND TURBINE CONSTRUCTION

Turbine Foundation

The turbine foundation will be a round shaped shallow mat type foundation. The foundation will include the basement, the mat, and the central pillar.

The area of each WTG foundation is estimated at about 330 m^2 and excavation depth at approximately three (3) m.

Formwork will be installed, braced, and reinforced prior to concrete being poured into the foundation. Formwork can be made of wooden planks. Formwork must be erected and tightened before concreting begins.

The concreting approach for the WTG foundation will include the following:

- Concrete is mixed at the batching plant with an electronic weighing system to ensure the exact quantity and quality of batches;
- Concrete trucks are specialized types to ensure that concrete is not stratified, dehydrated or wasted in transportation;
- Concrete is poured into the foundation by concrete pumps truck;
- Sampling of concrete (directly from concrete trucks) to measure the slump of concrete and use this concrete sample as test samples before concreting (pouring concrete into pumps to pump up construction site);
- Pumping concrete into the foundation by a pump; and
- Compacting concrete by electric batons ensures that the concrete slurry mixture becomes solid, concrete does not generate pores, the outside surface is not porous, and the concrete adheres to the reinforcement.

Maintenance work will include the following:

- Use of jute sacks soaked in water to cover the surface of the foundation to avoid quick evaporation of water causing cracks;
- Concrete is moistened by watering during the curing and shock-proof period to ensure a curing process; and
- The maintenance of concrete is conducted continuously for four (4) days from the time of pouring.

During the winter, concrete work will be challenging. Temperature control may be necessary or shading during the hot summer months. To help solidify the reinforced concrete, dryers or shading techniques may be used. Environmental factors will be accounted for in the construction schedule.

Turbine Installation

After completing construction of the WTG foundation, the next step is to assemble the wind turbine components. Lifting works begins with the lowest tower subsections. Complete nacelles, with gearboxes and generators already installed, will be lifted onto the tower tops. The hub is lifted and installed to the nacelle. A crane will lift each blade and each blade will be fixed to the hub accordingly. It is noted that the installation of some components cannot occur when the wind speed is greater than 12 m/s due to safety constraints of the cranes.

3.4.2.2 OVERHEAD LINE

The construction of OHL includes, but is not limited to, the following activities:

- Building the transmission pylons foundation, including:
  - Soil excavation; and
  - Installing the cast-in place reinforced concrete foundation.
- Assembling the pylons;
- Installation of insulation and accessories;
- Straining of rope to measure deflection;
- String power lines; and
- Grounding installation work.

At the time of writing, area of excavation pit was not available. For the preparation of one (1) OHL pole foundation, it is assumed that the area of an excavation pit can be between 150 and 400 m^2 at a depth between 2.7 m and 3.5 m. It is assumed excavated material will be used as backfilling in Project construction sites/ disposed at spoil disposal sites.

3.4.2.3 WATER USE AND SUPPLY

A water consumption estimation has been prepared and is presented in *Table 3-7* and *Table 3-7*, showing the assumptions and estimated water use by activity and the water use by month, respectively.

The total water consumption for construction, including 1) WTG construction and site civil works, 2) buildings, camp and substation civil works, 3) 220kV OHL (65 km), 4) road dust suppression, and 5) camp and accommodation water, is estimated to be 111,873 m^3. However, NZE have advised that the approximately 25,000 m^3 of water required for concrete / cement purposes would be provided by the concrete / cement contractor, and only 86,000 m^3 would be required by NZE. For the purpose of providing a conservative assessment, a total construction water requirement of 111,873 m^3 has been considered.

The water requirement is not constant over the 27 month construction period (nominally mid November 2026 to end January 2027) and varies from a minimum of 130 – 238 m^3/month at the end of construction up to a maximum of 8,885 m^3/month during peak construction activities in October 2027. Higher water requirements are estimated between March and

November each year (greater than 3,000 m^3/month) compared to December to February (winter, reduced construction activities).

TABLE 3-7: BREAKDOWN OF WATER REQUIREMENTS DURING CONSTRUCTION PHASE – BY USE

Water Use		Total Quantity (m3)	Total Duration (approximate months)		Assumptions
WTG Construction and Site Civil Works	WTG earthworks	288	9	March – November 2027	• 26m diameter working area per turbine, compacted in 300mm layers, at 75 L/m^3. • Applied to 24 turbines.
	WTG foundation concrete	3,360	9		• 700 m^3 of concrete per turbine at 200 L/m^3 mix water. • 24 turbines.
	Foundation concrete washout	840	9		• Mixer, chute and batch plant washout at 50 L/m3 of concrete placed, i.e. 25% of mix water. • Standard allowance for on-site batching.
	Foundation curing	1,008	9		• 500 m^2 of exposed foundation surface per turbine, wet-cured at 12 L/m^2/day for 7 days.
	WTG backfilling	1,260	9		• 700 m^3 of backfill per turbine at 75 L/m^3 compaction water.
	Hardstand construction	3,510	9		• 3,250 m^2 crane pad per turbine, 0.6m thick, at 75 L/m^3.
	Road construction	8,100	9		• 108,000 m^3 of compacted road formation at 75 L/m^3.
	Collection cable trench backfill	4,680	7	April – October 2028	• 62,400 m^3 of trench backfill at 75 L/m^3
Buildings, Camp and Substation Civil Works	Camp establishment	355	4	December 2026 – March 2027	• 300-person camp. • Modular housing blocks on prefabricated foundations, plus four concrete-founded facilities (80-person block, kitchen and canteen, gym hangar, rebar fabrication slab). • Water built up per building from subbase compaction, concrete volume and wet trades.
	Operation and maintenance building	168	4	May 2027 – August 2027	• 480 m^2 GFA, 2-storey RCC frame with masonry block and metal facade.

Water Use		Total Quantity (m3)	Total Duration (approximate months)		Assumptions
	WHS building	53	3	December 2026 – February 2027	• 360 m^2, single storey sandwich panel - low wet-trade content.
	Switchroom building	47	9	May 2027 – January 2028	• 294 m^2, single storey sandwich panel.
	Switchyard platform and foundations	283	9	May 2027 – January 2028	• 6,000 m^2 gravel-surfaced platform plus 900 m^2 of equipment foundations, plinths and cable trenches.
220kV Overhead Transmission Line (65km)	Tower foundation backfill	1,776	7	June 2027 – December 2027	• 228 towers on 912 footings (820 suspension, 92 anchor-angle). • Foundations are Russian standard series 3.407-115 PRECAST reinforced concrete units, cast at a plant and delivered - no pour water, no washout and no curing water is carried for the OHL. • Site water use is excavation backfill only: 23,682 m^3 of backfill at 75 L/m^3, derived from pit volume (footing plan size plus 0.5m working space each side, to founding depth) less the precast unit volume.
	OHTL access track dust suppression	3,731	7	June 2027 – December 2027	• The line is a mobile spread, so only part of the 65km right of way is trafficked at once. • Assumes a 10km active front on a 4m wide track, watered 2 days per week at 1.5 L/m^2/day, gated to the OHTL construction window and scaled by the same seasonal intensity profile as the site roads.
Road Dust Suppression	External road (30km)	27,430	24	November 2026 – October 2028	• 30km x 4.5m carriageway • Watered twice per week at 1.5 L/m^2/day, scaled by the monthly seasonal intensity profile.
	Internal road (10km)	41,837	20	March 2027 – October 2028	• 10km x 6m wide • Watered 7 days per week at 1.5 L/m^2/day, scaled by the same seasonal profile. The internal road takes all turbine component, concrete and spoil haulage.
Camp and Accommodation	Domestic - ablutions and general	7,012	27	November 2026 – January 2029	• 80 L/person/day applied to the monthly manning curve.
	Cleaning and canteen	2,629	27		• 30 L/person/day applied to the monthly manning curve.

Water Use		Total Quantity (m3)	Total Duration (approximate months)		Assumptions
	Laundry	3,068	27		• 35 L/person/day applied to the monthly manning curve.
	Potable / drinking	438	27		• 5 L/person/day applied to the monthly manning curve.
Total	111,873	27	November 2026 – January 2029		

Water usage estimates and assumptions provided by NZE. The water supply requirements are based on the initial Phase 1 construction of 24 turbines. The additional turbines to the maximum project proposed 29 turbines would require additional water supply for the purpose of WTG Construction and Site Civil Works, as well as Road Dust Suppression and Camp and Accommodation (assuming longer construction timeframes).

TABLE 3-8: BREAKDOWN OF WATER REQUIREMENTS DURING CONSTRUCTION PHASE – BY MONTH

Month	WTG Construction and Site Civil Works (m^3)	Buildings, Camp and Substation Civil Works (m^3)	220kV OHL (65 km) (m^3)	Road Dust Suppression (m^3)	Camp and Accommodation (m^3)	Total (m^3)
November 2026				225	126	351
December 2026		105		464	223	792
January 2027		163		186	294	642
February 2027		128		168	327	622
March 2027	1829	13		3623	344	5,810
April 2027	2240			4660	559	7,459
May 2027	2314	63		4816	613	7,807
June 2027	2240	87	662	3495	756	7,240
July 2027	2314	90	978	3612	746	7,740
August 2027	2314	65	978	3612	763	7,731
September 2027	2240	39	1160	4660	753	8,852
October 2027	2082	40	1199	4816	748	8,885
November 2027	793	39	518	1165	750	3,266
December 2027		40	12	241	749	1,042
January 2028		33		241	727	1,000
February 2028				225	638	863
March 2028				3853	578	4,431
April 2028	222			4660	551	5,433

Month	WTG Construction and Site Civil Works (m^3)	Buildings, Camp and Substation Civil Works (m^3)	220kV OHL (65 km) (m^3)	Road Dust Suppression (m^3)	Camp and Accommodation (m^3)	Total (m^3)
May 2028	764			4816	553	6,133
June 2028	739			3495	457	4,692
July 2028	764			3612	427	4,802
August 2028	764			3612	325	4,700
September 2028	739			4660	283	5,682
October 2028	690			4350	274	5,314
November 2028					238	238
December 2028					216	216
January 2029					130	130
Total (m^3)	23,046	906	5,507	69,267	13,147	111,873
Water usage estimates and assumptions provided by NZE						

Water supply for construction is not proposed to be sourced from site and would instead be sourced from offsite groundwater and trucked to site by water tankers, as outlined below.

[redacted]

The key supplier is proposed to be [redacted] which is a local government-owned service company located in Tsogttsetsii soum centre. This company holds a special license covering a broad range of water and wastewater services and currently owns five groundwater wells in Tsogtsetsii soum. [redacted]

[redacted]C

The backup option or supplementary water supply is [redacted] This company holds a special license for groundwater extraction, water supply, wastewater collection, and treatment services. [redacted]

[8] Letter No. 60 dated 29 September 2026.

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

3.4.2.4 POWER GENERATION FOR THE CONSTRUCTION PHASE

Temporary power for the construction phase will be supplied through a combination of a centralised photovoltaic (PV) and battery energy storage system (BESS) microgrid as well as dedicated diesel generators. The project site is not currently connected to the national grid and will therefore operate as a stand-alone power system. The worker accommodation camp, construction office and main laydown area will be supplied by a 650 kW PV array coupled with a 350 KV / 2.0 MWh BESS. A backup diesel generator rated at approximately 330-400 kVA will be provided solely for battery charging when solar generation is insufficient. The other remote with intermittent construction activities will be supplied by separate diesel generators, including a 400-500 kVA generator for the concrete batching plant, 50 kVA and 30 kVA generators for the substation construction area, and portable 4 kW generators at each of the wind turbine construction sites.

Fuel charging trucks of 5-ton capacity will likely be used for diesel supply. A Portable Fuel Station will be established near to the construction sites with location provided in *Figure 3-2*.

3.4.2.5 TRANSPORT AND TRAFFIC

WTGs and BESS equipment manufactured in China by [redacted] will be transported into Mongolia along the G242 road from their factories. From the Mongolia-China border, transport of the equipment will use the heavy-duty coal transportation road and a 30.9 km upgraded access road will be prepared and serve as the main access to reach the Project Site. In the same way, an existing 9.3 km long paved road will be used to access to the southern end of the OHL (refer *Section 3.3.1.5*). The heavy-duty coal transportation road is a 245 km long paved road between Ukhaa Khudag (Tsogttsetsii) and Gashuun Sukhait (Mongolia-China border) was put into operation in 2011. This road is designed for heavy-duty trucks, with a capacity of up to 100 tons, specifically for coal transportation. As such, this road can be used for transporting wind power station equipment, oversized machinery, and wind turbine components. It is unlikely transportation will encounter obstacles such as bridges or tunnels.

The fleet of mobile on-road machinery (refer *Table 3-6*) is estimated to generate maximum Annual Average Daily Traffic (AADT) of up to 440 Heavy Duty Vehicle (HDV) movements and up 7,600 Light Daily Duty Vehicle (LDV) movements during peak construction activity. In practice, vehicle movements will be lower outside peak construction periods.

[9] Letter No. 36 dated 28 September 2026.

3.4.2.6 WASTE GENERATION AND MANAGEMENT

Waste separation will be imposed in all project sites. Construction waste will be separated into hazardous waste and non-hazardous waste. Further breakdown of waste streams is provided in *Table 3-9*.

Waste storage will be at designated temporary waste storage area and hazardous waste sub-area, which will be fenced to prevent access from animals and loss due to wind, fitted with clear signage and hazard, properly sited away from drainage and wells and protected from flooding as well as access from waste collection and firefighting vehicles, bunded and covered in impermeable surface, equipped with emergency spill kits and firefighting equipment.

A verification system and log of disposal trucks for waste transportation off-site will be put in place to ensure that both construction and domestic waste is transported to the selected licenced facilities.

The non-hazardous waste generated by the Project is planned to be disposed through [redacted]C, a licensed waste management company based in Tsogttsetsii soum. The company operates a waste disposal facility on a 13.6 hectare landfill site located at Siirst bagh near Tsogttsetsii and is located about 60 km from the Project site. The disposal site was designated and authorised by the aimag governor under relevant national waste and local governance legislation. The company holds the necessary permits to collect, recycle, dispose of, and bury domestic and non-hazardous waste in accordance with Mongolian regulations. This existing facility serves the local region and has the available disposal capacity to receive the waste generated by the Project. Environmental law enforcement and compliance monitoring of the site are jointly overseen by aimag's Investment and Development Policy Planning Division, its Environment and Tourism Department, the Professional Inspection Agency, and the Governor of Tsogttsetsii soum.

The hazardous waste generated by the Project is planned to be disposed through [redacted]C, based in Gaviluut bagh at Khanbogd soum near the Oyu Tolgoi mine. The company holds a special licence to collect, transport, recycle and dispose of 53 categories of hazardous waste. Waste that is recyclable will be processed and recycled locally, at either the existing recycling facilities in Bayan bagh in Khanbogd soum, or in Siirst bagh in Tsogttsetsii soum. Waste that is not suitable for recycling will be transported by the company to facilities in Ulaanbaatar for further proper handling.

Collection and disposal of wastewater generated by the Project will be through [redacted], a local government-owned service company located in Tsogttsetsii soum centre that holds a special license covering a broad range of water supply and wastewater services. The wastewater will be transported to the Ukhaa Khudag wastewater treatment centre at Tsogttsetsii soum.

TABLE 3-9: WASTESTREAM AND DISPOSAL STRATEGY

Waste Stream	Method /Specifications on construction site	Disposal Site
Non-Hazardous Waste		
Top soil[10]	Strip and stockpile separately for rehabilitation and reinstatement	Reused on-site

[10] Top soil is not considered waste and would be retained for habitat restoration works.

Waste Stream	Method /Specifications on construction site	Disposal Site
Surplus excavated soil	Reuse as backfill and road base material. Only excess material to be disposed.	Primarily reused on-site. Local approved disposal area (confirmed with the Tsogttsetsii Soum Governor)
Concrete waste and surplus concrete	Reuse or recycle where feasible; residual waste disposed off-site	[redacted] disposal facility
Empty cement bags	Collect and dispose	[redacted] disposal facility
Scrap metal (steel offcuts, cable offcuts, reinforcement structural steel, steel banding, electrical installations)	Segregate and reuse where possible: send for recycling	Recycling facilities in Siirst bagh (Tsogttsetsii) or Bayan bagh (Khanbogd).
Timber pallets, crates and wooden packaging	Return to supplier where possible or recycle as timber waste where possible	[redacted] disposal facility
Plastic packaging and wrapping	Segregate into recyclable and residual fractions	[redacted] disposal facility
Cardboard packaging	Segregate and send for recycling	[redacted] disposal facility
Domestic/camp/canteen waste: Food and organic waste	Segregated and stored in sealed containers and routine off-site disposal	[redacted] disposal facility
Domestic/camp/office solid waste: paper, cardboard, glass, plastic bottles, metal cans	Segregated in bins and routine off-site disposal. Recycle where possible	[redacted] disposal facility
Ash and combustion residues (from heaters)	Segregated in sealed containers and send for off-site disposal	[redacted] disposal facility
Wastewater: Sewage water	Collected in septic tank and collected and transported off-site. No disposal to land.	Ukhaa Khudag wastewater treatment centre
Wastewater: Concrete washout water	Collected in septic tank and collected and transported off-site. No disposal to land	Ukhaa Khudag wastewater treatment centre
Hazardous Waste		
Tyre waste	Segregated and send for off-site disposal	Recycling facilities in Siirst bagh (Tsogttsetsii) or Bayan bagh (Khanbogd) or facilities in Ulaanbaatar.
Used lubricating oil	Segregated in sealed containers and send for off-site disposal	Recycling facilities in Siirst bagh (Tsogttsetsii) or Bayan bagh (Khanbogd) or facilities in Ulaanbaatar.
Waste hydraulic oil	Segregated in sealed containers and send for off-site disposal	Recycling facilities in Siirst bagh (Tsogttsetsii) or Bayan bagh (Khanbogd) or facilities in Ulaanbaatar.

Waste Stream	Method /Specifications on construction site	Disposal Site
Oil-contaminated absorbents and rags	Segregated	Recycling facilities in Siirst bagh (Tsogttsetsii) or Bayan bagh (Khanbogd) or facilities in Ulaanbaatar.
Oil-contaminated soils	Segregated	Recycling facilities in Siirst bagh (Tsogttsetsii) or Bayan bagh (Khanbogd) or facilities in Ulaanbaatar.
Empty chemical containers	Segregated	Recycling facilities in Siirst bagh (Tsogttsetsii) or Bayan bagh (Khanbogd) or facilities in Ulaanbaatar.
Chemical waste	Segregated	Recycling facilities in Siirst bagh (Tsogttsetsii) or Bayan bagh (Khanbogd) or facilities in Ulaanbaatar.
Used batteries	Segregated	Recycling facilities in Siirst bagh (Tsogttsetsii) or Bayan bagh (Khanbogd) or facilities in Ulaanbaatar
Fluorescent lamps and e-waste	Segregated	Recycling facilities in Siirst bagh (Tsogttsetsii) or Bayan bagh (Khanbogd) or facilities in Ulaanbaatar

3.4.3 OPERATION PHASE

The Operation and Maintenance (O&M) of the WTGs is estimated at 20-25 years.

Activities that will be carried out during the operation phase include:

- Scheduled annual maintenance activities at each WTG location as per the supplier's specifications;
- Routine inspection of all WTGs as per supplier's specifications;
- Operation and maintenance of ancillary facilities such as Substation, BESS, storage areas, and other existing facilities;
- Inspection and maintenance of OHL; and
- Inspection and maintenance of internal roads and Access Road.

The WTGs will operate at all times, provided that wind speeds are suitable, with the exception of downtime required for maintenance activities. For the most part, day-to-day facility operations will be automated through the use of computerized networking systems.

3.4.3.1 WTG MAINTENANCE

Once constructed, it is expected that the WTGs will have regular gearbox maintenance and blade inspection. Maintenance activities normally consists of the following, but are not limited to:

- Visual inspections;

- Hydraulic system adjustments;
- Gearbox oil sampling, testing;
- Safety systems;
- Filter and oil changes (as necessary); and
- Greasing.

3.4.3.2 TRAFFIC

Traffic during operation will be limited to maintenance vehicles and movement of employees around the Project Site. Maintenance vehicles will use the Access Road for initial service and routine maintenance. It is assumed that a maximum of five (5) passengers per vehicle and one (1) van/light-duty truck will visit the Project Site per day. Thus, operation phase traffic movements are expected to be low.

3.4.3.3 WATER CONSUMPTION AND SUPPLY DURING THE OPERATION PHASE

During the operation, NZE estimates water consumption to be 42 m^3/day (equivalent to approximately 1,260 m^3/month or 15,330 m^3/year). The water demand was calculated by NZE based on the water consumption norms for producing a unit of output, performing work, or providing services, approved by Order No. A/301 of the Minister of Environment and Green Development in 2015. The operational requirement is much lower than the maximum water supply during construction (8,885 m^3/month).

NZE have indicated that no water source has been identified at or close to the site. Therefore, the project proposes to use the same offsite water sources during operations as for construction i.e. [redacted] (as outlined in *Section 3.4.2.3*) and official approval will be sought if needed.

Alternative options also exist for operational water supply, including a [redacted] of Tsogttsetsii soum. This well was built in 2021 and has a flow rate of 0.7 L/sec (60.48 m^3/day), which is equivalent to 726 m^3/month or 22,075 m^3/year. Therefore, this groundwater well could also provide the operational water requirements (42 m^3/day). On 28 September 2026, the National Water Agency indicated that the “exploitable water resource reserve is sufficient to supply the Project's total water demand of 42.0 m^3/day from the well with a yield of 0.7 L/sec (60.48 m^3/day)”.

If an onsite groundwater source is identified in the future, this may also be considered as water supply for the site operations. However, this would be subject to appropriate approvals, including assessment of sustainability and impacts on existing users (specifically the local herders).

3.4.3.4 WORKFORCE

During operation it is expected a limited number of full-time employees working on Project Site during operation, maintenance, and security roles. It is expected that a total of 34 people will be employed for O&M activities with 17 persons per shift.

3.4.3.5 WASTE GENERATION AND MANAGEMENT

Waste during Project operation will consist of domestic waste generated by Project’ workers, non-hazardous and recyclable waste from office activities, replaced mechanical/electrical parts

during repair and maintenance activities, some minor empty chemical containers, contaminated wastes, rags, changed machinery oils and lubricants and welding electrodes.

Routine maintenance waste streams generated from maintenance of the WTGs, OHL, substation, and BESS during Project operation will consist of:

- Used lubricating and gear oil;
- Used filters, rags and small components;
- Worn or damaged WTG components; and,
- Transformer oil

BESS operational waste generated during Project operation will consist of:

- Battery cooling fluid; and,
- Battery management system components

Used lubricating and gear oil will be collected in sealed drums at maintenance workshop and transferred to a licensed used-oil recovery contractor. Used rags and small components will be collected as hazardous waste and disposed of by a licensed contractor. Worn or damaged WTG components will be assessed for reuse, remanufacture or recycling and a component replacement log maintained. Used transformer oil will be collected and disposed by licenced contractor with capability for PCB analysis to confirm it is PCB free before recycling. All battery used cooling fluid changes shall be collected and disposed of as hazardous waste by a licensed contractor. Circuit boards, sensors, and electronic components replaced during operation shall be collected as e-waste and disposed of by the licensed e-waste contractor. Waste from the operations office and welfare facilities will be segregated at source. For waste transportation off-site, a waste permit system will implemented.

3.4.4 DECOMMISSIONING PHASE

At the end of the operational lifespan of the Project, decommissioning phase would take place to remove the WTGs or new application would be made to extend the consent for the existing WTGs or repower them. The decommissioning phase will include workforce mobilization and presence, the dismantling of the WTGs and the WTGs' foundations, Substation and BESS, and internal cabling. Wastes, emissions and discharges generation, handling, storage, and disposal will also be included into the Environmental and Social Management Plan for the decommissioning phase.

There are typically two (2) options for the decommissioning phase of a wind farm project:

1. A well-sited wind farm remains in operation. An out-of-date WTG is replaced with a working turbine of equivalent or even better generation capacity, which depends on the Project Proponent's decision.
2. If the site is to be abandoned after completion of the designed plant life, decommissioning should be initiated by dismantling the turbine components. The tower and blades of the to-be-removed WTG will be taken down by crane, disassembled into smaller components and then the turbines will be refurbished at source or used elsewhere by another project. The blades of wind turbines can be recycled to make alternative types of cement or embankment materials for nearby local construction works. The concrete should be broken up and removed to a landfill site. Infrastructure such as roads and OHL should be handed over to the government for use.

It is noted that decommissioning will need to be conducted under the prevailing laws and regulations of Mongolia available at the time of the decommissioning activities, including a detailed impact assessment, and decommissioning plan (repowering option, dismantling option) that should be developed prior to decommissioning. Repowering option will also be considered internally.

At the time of writing, detailed information of the decommissioning phase is unavailable and no plan for the decommissioning phase has been prepared. For that reason, this phase was scoped out in this ESIA. Decommissioning environmental and social risks and impacts will be addressed and managed through the Project ESMP (refer to *Chapter 11* for outline content of a framework decommissioning plan).

3.4.5 UNPLANNED EVENTS

There is the potential for unplanned events to occur during the construction, operation, or decommissioning phases of the Project. Examples of unplanned events include:

- Leakage and spill incident;
- Fire and explosion;
- Blade throw/ice throw;
- Equipment failure;
- OHL snapping and transmission pylon collapse; and
- Vehicle collision.

3.5 PROJECT MANAGEMENT

Some key parties involved in the project management, include the following:

- Project Proponent: NZE
- Equipment Supplier: [redacted]
- Construction contractor: [redacted]
- O&M contractor: [redacted]

3.5.1 CONSTRUCTION

The main labour source for the construction phase includes (i) local labour supplied by local construction company; and (ii) foreign consultant or Owner's Engineer and project management team.

During construction, the EPC contractor and sub-contractors will arrange for workers to live at a workers' accommodation facility located at the project site.

Project implementation manpower shall consist of management personnel from the Project Proponent, consultants, and personnel from EPC contractor, including sub-contractors, and material, equipment vendors.

During construction the expected personnel employment will be as follows[11]:

- Number of working day/year: ~300 days (average);

[11] All working hours, overtime compensation, and rest entitlements shall be in accordance with the Labour Law of Mongolia (2021).

- Construction period: 17 months;
- Number of shifts/day: Two (2) shifts/day camp – each shift will not exceed twelve (12) hours; and,
- Rotation schedule: Twenty (20) consecutive working days followed by ten (10) days of rest.

3.5.2 OPERATION

The Project Owner will hire a professional company to perform technical and commercial management. The contract time is expected to cover the lifetime of the Project, i.e., 20-25 years. The total employees during the operation and maintenance phase is expected to be 34 people with 17 people working per shift. The O&M services of the WTGs will be performed by [redacted] staff will not be permanently based at the Control Building but will reach the Project Site for periodic maintenance activities.

3.6 PROJECT ALTERNATIVES

In this section, Project alternatives are identified and analysed, including but not limited to the Project Site location, design, technology and a no-project alternative (which is a scenario wherein the Project development does not take place). An analysis of certain alternatives to the Project development in relation to the design and alternatives for power generation are considered.

3.6.1 NO PROJECT SCENARIO

3.6.1.1 MONGOLIA'S ENERGY CONTEXT

Mongolia is heavily dependent on coal for its primary energy source, as demonstrated by the fact that the energy sector is the largest domestic contributor to greenhouse gases, accounting for two thirds of the total amount of greenhouse gas emissions. Currently, coal alone accounts for 60% of the greenhouse gas emissions in Mongolia[12]. The majority of Mongolia's primary energy supply consists of non-renewable energies with 8% of Mongolia's 2024 total primary energy supply having consisted of renewables[13].

The largest portion of the non-renewable energy supply is made up of coal, with gas being the second largest energy source. It was reported that, for instance, in 2018, 93% of all electricity was produced by thermal power plants, and 98% of all district heat was provided by coal-fired systems[14]. Despite having abundant renewable resources to produce electricity, Mongolia currently lacks the sufficient generation capacity required to meet its electricity needs and therefore imports power from Russia and China (amounting to 20.8% in 2024[15]) to compensate for shortfalls of power during the winter peak periods, thereby demonstrating Mongolia's dependence on electricity imports in recent years. Some industries such as Oyu Tolgoi Mine use electricity imports from China. By 2023, Mongolia had three (3) wind farms,

[12] Dolgor, S. 2021. Partnership for Ambitious Climate Action in Mongolia. Available at: https://mongolia.un.org/en/106855-partnership-ambitious-climate-action-mongolia [Accessed May 2025]
[13] https://lowcarbonpower.org/region/Mongolia
[14] Oyunchimeg, C., Tuya, N, Zorigt, D, Sukhbaatar, T., Bayarkhuu, C., 2020. Energy Sector Current Status, Recent Developments and Energy Policies In Mongolia. NAPSNet Special Reports. Available at: https://nautilus.org/napsnet/napsnet-special-reports/energy-sector-current-status-recent-developments-and-energy-policies-in-mongolia/ [Accessed in May 2025]
[15] https://lowcarbonpower.org/region/Mongolia

nine (9) solar farms, and small hydropower plants, accounting for 18.3% of the total installed capacity and only 9.6% of total electricity production[16]. In 2024, it was reported only 5% of electricity supply in Mongolia was from wind farms[17]. The three wind power stations, namely the Salkhit Wind Farm (50 MW), the Sainshand Wind Farm (55 MW), and the Tsetsii Wind Farm (50 MW) have a total capacity of 155 MW. In this context, this Project will more than double the total capacity of electricity generation from wind farms in Mongolia and represent the largest wind farm project to date.

3.6.1.2 MONGOLIA'S RENEWABLE ENERGY POTENTIAL AND POLICY DIRECTION

The main objective of the State Policy on Energy for 2015-2030 is to build energy security for the country, in order to ensure sustainable development of the energy sector and to encourage faster deployment of renewable power generation technologies. With the aim of decarbonising Mongolia's energy sector, ensuring the reliability and stability of the energy sector, and addressing the concern of local air pollution from power and heating plants in urban areas, the Mongolian government aims to increase the domestic share of renewable energy by tapping into its vast renewable energy resources, and focussing in particular on wind and solar power.

The government's aim is to build export-oriented power plants and to attain a share of renewable energy in total installed capacity of 20% by 2023 and 30% by 2030 as announced within the State Policy on Energy, 2015-2030. By doing so, Mongolia aims to become an energy exporting country through the utilization of its renewable energy resources with efficient and environmentally friendly technologies. The National Renewable Energy Centre (NREC) estimated that Mongolia's total renewable energy potential is 2.6 terawatts of electricity[18], far exceeding its current generation capacity of 1.5 GW. The Gobi region in particular has significant renewable energy potential and its favourable weather conditions would allow for the effective use of wind and solar resources, which according to IRENA, if the renewable energy potential is realised, the electricity output from the country's potential solar and wind resources alone could reach 15,000 terawatt-hours of electricity per year in the future[19]. Specifically for wind resource, Umnogovi Province (i.e. the location of this Project) was identified with the most wind resource potential (600,000 to 800,000 MW) in comparison to any other province in the country[20] (*Figure 3-11)*.

The State Policy on Energy for 2015-2030 was split into two stages, with the first stage (2015-2023) being allocated for the development of energy resources, backup capacity, and a foundation for the development of renewables. The installed power capacity is set to double, and advanced critical technologies involving liquefying and carbonating coal and shale will begin to be introduced[21]. It is expected that hydropower will take up at least 10% of the total installed power capacity with its backup capacity also being increased to 10% to aggressively

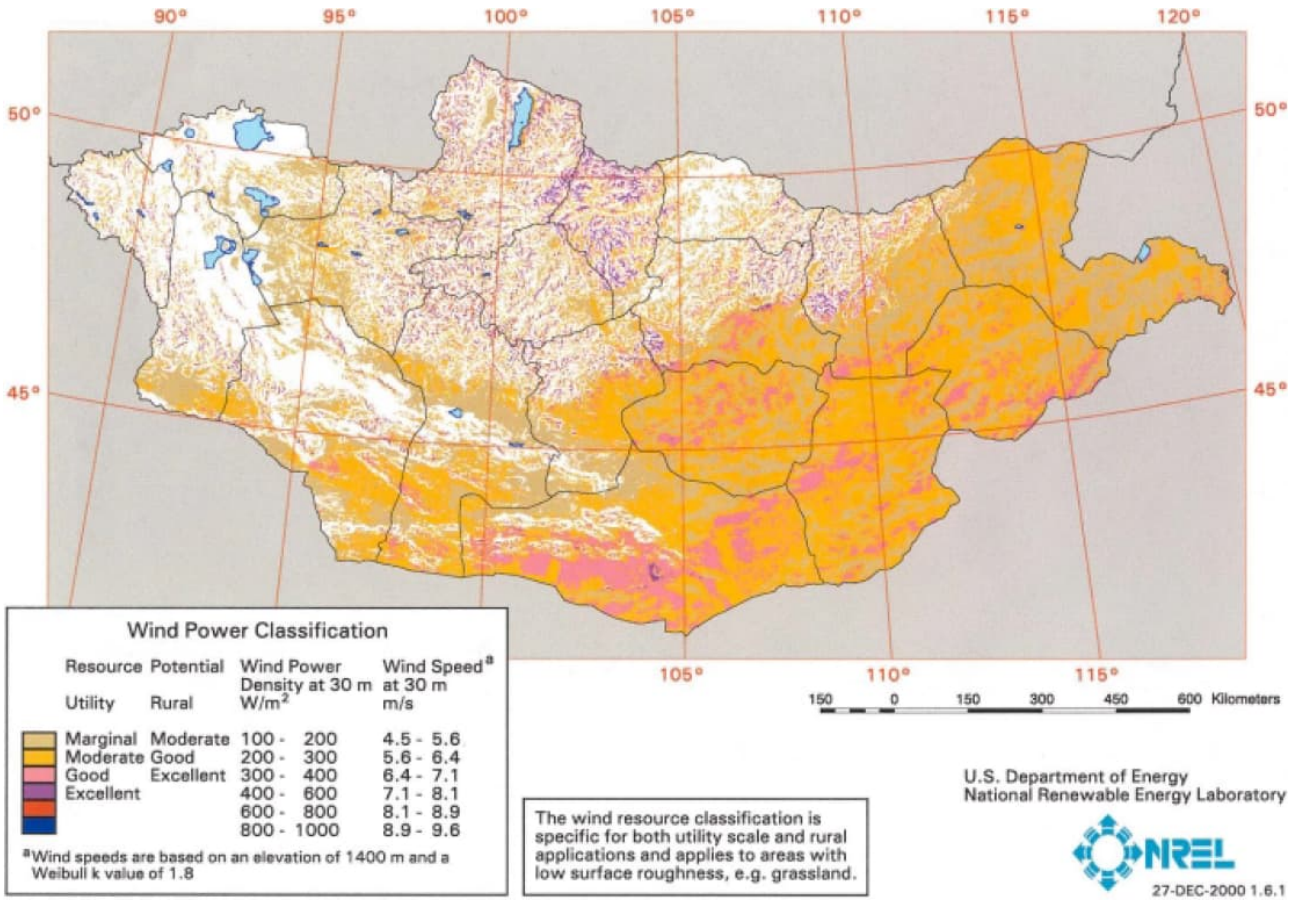
[16] Dimsovska D. 2024 Mongolia's Clean Energy Transition: A Pathway to Sustainable and Inclusive Development. Available at: https://www.undp.org/mongolia/blog/mongolias-clean-energy-transition-pathway-sustainable-and-inclusive-development [Accessed May 2025]
[17] https://lowcarbonpower.org/region/Mongolia
[18] IRENA 2016. Mongolia Renewables Readiness Assessment. Available at: https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2016/IRENA_RRA_Mongolia_2016.pdf [Accessed May 2025]
[19] IRENA 2016. Mongolia Renewables Readiness Assessment. Available at: https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2016/IRENA_RRA_Mongolia_2016.pdf [Accessed May 2025]
[20] Elliot D. et al. Wind Resource Map of Mongolia. Available at https://docs.nrel.gov/docs/fy01osti/28972.pdf [Accessed May 2025]
[21] Ministry of Energy 2019. Energy Sector of Mongolia Country Report. Available at: https://eneken.ieej.or.jp/data/8484.pdf [Accessed May 2025]

progress the development of the renewables sector[22]. During the second stage (2024-2030), the government plans to export secondary energy and develop the renewables sector sustainably. The State Policy for Energy for 2015-2030's aims were affirmed in Mongolia's 'New Revival Policy' in 2021 covering broader economic strategies for the country, with energy revival strategy continuing to aim to integrate Mongolia into regional energy networks and reduce reliance on energy imports. Overall, the government encourages and supports private investment in new power sources to expand the country's power energy consumption.

The financing of clean energy investments is a booming market, and after 2030, with the continued trend of fossil fuels' increasing in price, the investment cost of fossil fuel power sources will increase due to stricter environmental standards while the power production cost of renewable energy sources will fall following improvement in the related technologies. As a result, renewable energy sources will be able to compete economically with traditional power sources.

However, despite the targets set within the State Policy on Energy for 2015-2030, to increase the share of renewable resources to 20% in 2020, the current governmental program only aims at a 3% to 4% share of renewable energy. The Ministry of Energy is constructing two coal fired power plants (24 MW and 40 MW) to supply the Western System, while Chinese investors also plan to construct a 4,800 MW coal power station in Southern Mongolia during the next decade. The plan is for the power station to be supplied with coal from Mongolia and the electricity generated to be exclusively transmitted to China, and thus in practice, making it a Chinese power station located in Mongolian territory which is not connected to the central grid.

[22] Ministry of Environment and Tourism 2017. Mongolia's Initial Biennial Update Report under United Nations Framework Convention on Climate Change. Available at: https://unfccc.int/sites/default/files/resource/Mongolia%20BUR1%20resubmission%20and%20NIR_CMS.pdf [Accessed August 2022]



Source: U.S. National Renewable Energy Laboratory (2000)

FIGURE 3-11: WIND RESOURCE MAP OF MONGOLIA

3.6.1.3 POWER DEMAND AT OYU TOLGOI MINE

As described previously, Oyu Tolgoi Mine currently uses electricity imports from China. The current annual import of electricity for this mine is 1.4 billion kWh, which is expected to increase to 1.9 billion kWh. In response, the Government of Mongolia is implementing the Tavan Tolgoi Power Plant Project. [redacted] Any additional demand estimated to be 600 million kWh can be supplied by domestic renewable energy sources, such as from this Project.

3.6.1.4 NO PROJECT SCENARIO

The 'no project alternative' considers the consequences in case a decision not to proceed with the Project is made. In this scenario, the possible positive and negative impacts of the proposed activities on the receiving environment and social receptors would not occur.

Specific benefits of the no project alternative are considered to be the following:

- The potential adverse impacts on the environment e.g., dust emissions, contamination of soil and water, and to biodiversity habitats e.g., permanent and temporary loss of habitats due to constructing of the Project, including the construction of the transmission line and roads will be avoided;

- The possible social disruption and health impacts arising from the construction and operational activities; e.g., impacts to health and safety of community, unplanned events, loss of land which they depend on, would be avoided; and
- The land within the proposed Project sites would remain in its existing condition and continue to be available for current and alternative use including livestock grazing.

Accordingly, no Project-related impacts on local community (e.g. herders) within the Project Area are anticipated under this scenario.

Conversely, the disadvantages of the no project alternative are that the power supply will continue to be met by other sources, and the country will continue to rely on fossil fuels as its primary energy sources including reliance on electricity imports. As a result of the Project not moving forward, the significant economic and environmental benefits arising from renewable wind power generation would not be obtained including the following:

- If the Project does not proceed, the opportunity to produce clean energy from local renewable resources, thereby enhancing national energy security and reducing dependence on conventional energy sources, would not be realised.
- In the absence of the Project, its contribution to the implementation of the New Revival Policy would not occur, and the country would continue to rely on imported electricity rather than providing competitively priced green energy to the mining sector to enhance export competitiveness.
- Without the Project, rising electricity demand from the Oyu Tolgoi mine would continue to be met through imports, and the current annual import of approximately 1.4 billion kWh of electricity from China would likely increase over the Project's 20-year operational life.
- If the Project does not proceed, the generation of electricity from renewable sources and the associated avoidance of greenhouse gas emissions and air pollutants relative to fossil-fuel-based generation, would not be achieved; and,
- Under the no project alternative, the positive socio-economic benefits anticipated during the construction and operational phases, particularly the creation of local employment opportunities and associated income-generation opportunities would not materialise. No Project-related changes to existing livelihoods, land use patterns, or local economic conditions are therefore anticipated under this scenario.

3.6.2 ALTERNATIVE METHODS OF POWER GENERATION

This section discusses several alternatives to the development of a wind farm project. This mainly includes other suitable renewable energy alternatives in general, as well as other non-renewable alternatives for power generation such as conventional thermal power plants.

There are a range of potential power generation options, and a summary of the advantages and disadvantages of these options are provided in *Table 3-10*. Compared to most other traditional power generation methods, wind power projects have a limited irreversible impact on the environment and contribute to the reduction of reliance on fossil fuel generated energy, which cause increase greenhouse gas emissions levels and aggravates the climate change crisis. With a purpose to improve national electricity demand in the coming years, the wind power method is selected for producing electricity to meet the supply-demand balance of power resource.

The Project is currently consistent with the State Policy on Energy for 2015-2030, which aims to increase the share of renewable energy in the overall electricity mix to reduce greenhouse gas emissions and build energy security and sustainability, with a focus on Mongolia's solar and wind energy potential.

TABLE 3-10: COMPARISON OF POWER GENERATION METHODS

System	Advantages	Disadvantages
Supercritical thermal power	• Large-scale production potential; • Moderate gestation period; • Wider distribution potential; • Provides cheap electricity to the consumer; • Provide stable output and reliable electricity on the grid; • Easily accessible and well-established technology; • Requires less land per MW.	• High fossil fuel consumption; • Large quantities of water required for cooling and steam generation; • High volume of stack gas emission from the operation; • Cause for global warming; • Accumulation of fly and bottom ash (in case of coal powered installations); • Industrial wastewater discharge; • Upstream impact from mining and oil exploration.
Ultra-supercritical thermal power	• In addition to the above advantages: • Improved efficiency by reaching higher pressure and temperatures compared to supercritical boilers; • Reduced emissions, particularly of CO_2 and mercury; • The general rule of thumb is that each percentage point of efficiency improvement yields 2–3% less CO_2; • Potentially lower operating costs.	• As above.
Hydropower	• GHG emission estimated as low; • Do not create any waste by-products during the conversion process; • Some hydropower facilities can quickly go from zero power to maximum output. Because hydropower plant can generate power to the grid immediately, they provide essential back-up power during major electricity outages or disruptions.	• Site specific, dependent on reservoir/run-off-river type; • Long gestation period; • Alteration of river flow regime; • Loss of agricultural productivity in the basin; • Sedimentation; • Alteration of aquatic life in the river; • Microclimate change effects within the basin; • Adverse social and ecological impacts due to inundation and downstream effects; • Risk of dam rupture and downstream floodings; • Livelihood alteration impacts due to high land acquisition demands.
Solar power	• Pollution levels are insignificant; • Inexpensive power generation;	• Large land requirement; • Site-specific, dependent on solar insolation;

System	Advantages	Disadvantages
	• Inexhaustible solar resource; • GHG emissions estimated as low.	• Low efficiency; • Expensive installation; • Reduction of pastureland for herders; • Visual and reflection impacts; • High environmental pollution impacts during manufacturing and decommissioning of the solar panels; • Non-recyclable wastes.
Wind power	• Pollution levels are insignificant; • Inexpensive power generation; • Inexhaustible wind resource; • GHG emissions estimated as low.	• Medium land requirement; • Site-specific, dependent on wind pattern; • Expensive installation; • Impacts to avifauna.
Nuclear power	• GHG emissions estimated as low; • Low fuel cost; • The production of electric energy is continuous. A nuclear power plant generates electricity for almost 90% of annual time. It reduces the price volatility compared to other fuels; • Do not emit smoke particles or gases.	• Availability of fuel source; • High water demand for cooling; • Hazards associated with radioactive material; • High cost of project; • Disposal waste is expensive, as wastes are radioactive in nature; • Long gestation period; • Risk of fallout and meltdown scenarios and its impacts on the local population and environment.

3.6.3 DESCRIPTION OF SITE SELECTION

3.6.3.1 APPROACH

The Project considered feasible alternatives during the early planning stage to identify a site capable of meeting the Project's technical requirements while avoiding or minimizing environmental and social risks. The primary objective was to develop up to 200 MW of renewable energy generation capacity, supported by battery energy storage, to supply renewable power to the Oyu Tolgoi (OT) mining operation. Consequently, proximity to the OT site was established as a fundamental site selection criterion.

Site identification commenced in early 2023 and focused on areas within a 100 km radius of the OT site. Potential locations were screened using available wind resource information and a range of environmental, social, land use, and technical constraints.

The screening process considered:

- Wind resource potential based on ERA5 wind data;
- Availability of a contiguous land area of approximately 10,000 ha suitable for a ~200 MW wind power facility;
- Terrain characteristics, including relatively flat topography suitable for construction;
- Existing land tenure and land possession rights;

- Presence of mineral exploration licences;
- Density of herder winter and spring camp allocations;
- Proximity to strictly protected areas, nationally protected areas, locally protected areas, and lands reserved for special state purposes; and
- Existing infrastructure and access considerations.

The objective of this screening process was to identify a technically viable location while reducing potential conflicts with sensitive environmental receptors, competing land uses, and existing land rights.

3.6.3.2 EVALUATION OF ALTERNATIVE SITES

Based on the desktop review, three potential sites were identified within the study area and advanced for further consideration. The sites were subsequently discussed with the local governments of Bayan-Ovoo, Khanbogd, and Tsogttsetsii soums. Project information and requests for land possession rights were submitted in June 2023 to facilitate consideration within each soum's development planning framework.

The evaluation of alternatives involved both environmental and administrative considerations. Environmentally, preference was given to sites that maintained separation from protected areas and areas designated for special state needs. Social considerations included reducing potential interactions with existing pastoral land uses by favouring areas with comparatively fewer herder camp allocations. Technical considerations focused on wind resource quality, land availability, terrain suitability, and proximity to existing infrastructure.

Following consultations with the respective soum authorities, the alternative sites in Bayan-Ovoo and Khanbogd were not progressed because the local governments indicated that the Project would not be incorporated into their development plans and, consequently, land possession rights would not be granted. As a result, these locations were considered infeasible from a regulatory and land access perspective.

The site within Tsogttsetsii soum remained viable and was advanced to a competitive project selection process initiated by the soum government in late 2023. NZE LLC's proposal was subsequently selected, and a land possession agreement was concluded, granting rights to hold the land and develop the Project.

3.6.3.3 REASONS FOR SELECTION OF PREFERRED SITE

The preferred site in Tsogttsetsii soum was selected because it most satisfied the Project's technical, environmental, social, and land access requirements. Key factors supporting selection included:

- Location within the required proximity to the OT mine, facilitating integration with the intended power supply arrangement;
- Suitable wind resource potential identified through ERA5 wind data analysis;
- Availability of sufficient contiguous land area for the planned renewable energy development;
- Relatively flat terrain suitable for construction;
- Reduced overlap with existing land possession rights and mineral licence areas;
- Lower potential for interaction with herder camp allocations; and

- Separation from protected areas and other environmentally sensitive lands.

Potential sites located south of the OT mine were considered during the initial screening phase but were eliminated from further assessment. These locations generally exhibited lower elevations and correspondingly lower wind resource potential. Furthermore, they were situated closer to specially protected areas, increasing the potential for environmental and biodiversity constraints. On this basis, southern alternatives were screened out as less favourable from both technical and environmental perspectives.

3.6.4 OHL LAYOUT ALTERNATIVES

Two options for the OHL routing have been considered for the Project (refer *Figure 3-12*)

- OHL Option 1 North Route – This ~65 km route traverses from the WTG Area in the Bilgeh Bagh (Tsogttsetsi Soum) through Jargalant Bagh (Manlai Soum) and then through Gavilud and Javhlant Baghs (Khanbogd Soum) to the Oyu Tolgoi mine's central substation. It is the option with the shortest route with a large portion of the route running parallel to an existing TL and is the preferred option because of the flatter, less harsh terrain conditions and because less of the TL route approximately 12.2 km traverses though one locally protected area namely Gurvan gavluud, Har deliin tolgod. Although traversing through locally protected area, construction will not compromise its conservation objectives, since there is no government-recognised management plan in place for the locally protected area and the Khanbogd soum governor officially confirmed no objection to the route[23]. Overall, in developing this option, the route was designed to avoid crossing enterprise and privately owned land (winter/spring camps and residential areas), historical monuments, and specially protected areas. Consideration was also given to avoiding, as much as possible, difficult terrain such as mountainous and deep valley areas along the route; and
- OHL Option 2 South Route – This ~65 km route traverses from WTG Area in the Bilgeh Bagh (Tsogttsetsi Soum) through 1st Bagh (Bayan-Ovoo Soum) and then through Gavilud and Javhlant Baghs (Khanbogd Soum) to connect to the Oyu Tolgoi mine's central substation. This route is longer than the alternative option and would cross more hilly, rocky and hard terrain. Option 1 would also pass through two locally protected areas (Gurvan gavluud, Har deliin tolgod and Ih baga luus) compared to one under the alterative. Approximately 22.3 km of its route would be traverses through locally protected areas.

[23] Official Letter No 01/880 dated 6 October 2026.

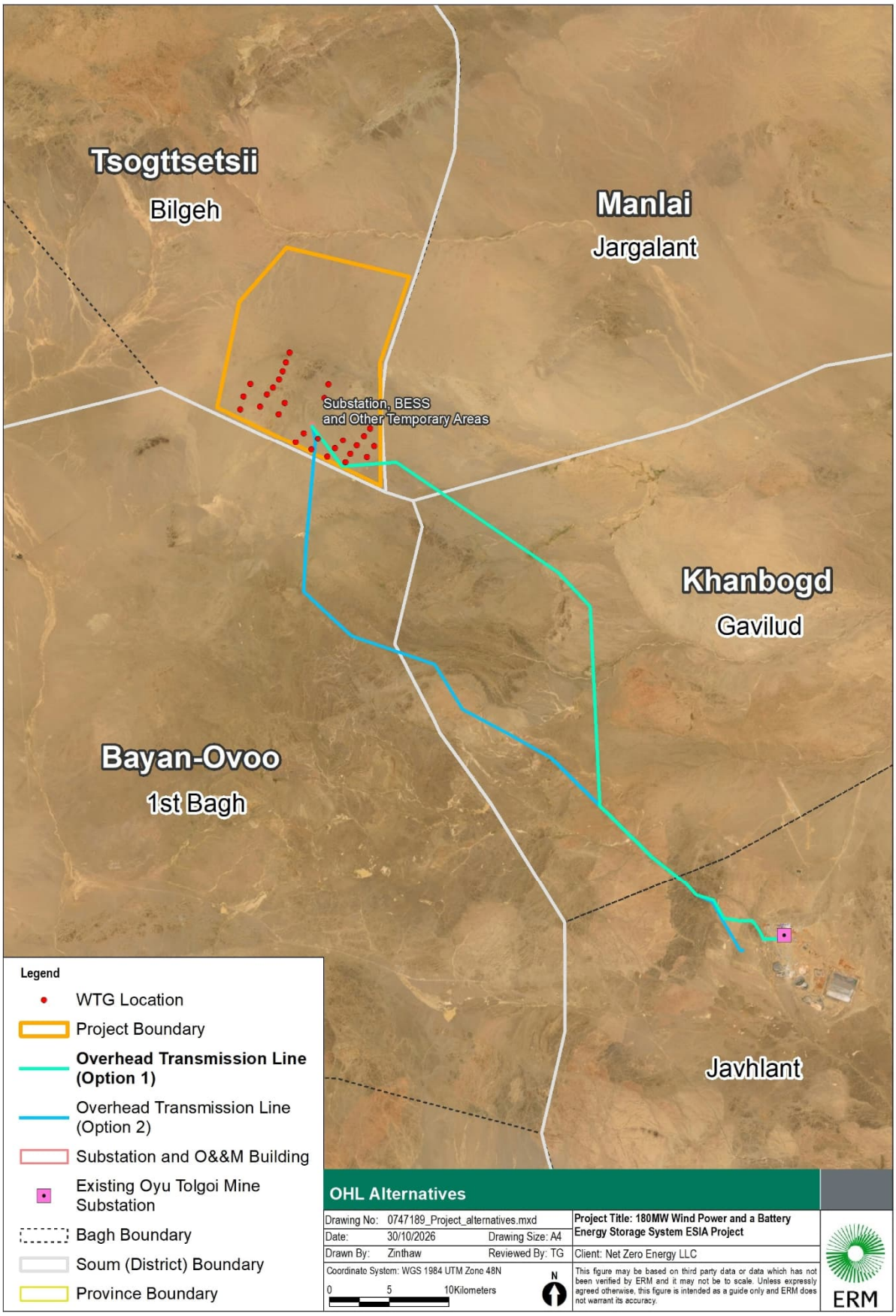


FIGURE 3-12: OHL ALTERNATIVES

3.6.5 WIND TURBINE ALTERNATIVES

The WTG area siting is constrained by land lease area granted for the project which covers 20,438-hectare land located in Tsogttsetsii soum. The Project has chosen WTG model [redacted] with 6.25 MW capacity on the basis that it provides more consistent power generation under the prevailing wind resource condition at the site in comparison to other considered WTG models. During the ESIA process, the Project has adopted the proposed WTG locations layout (as shown in *Section 3.2.1*) instead of an initial alternative WTG layout option. In this way, the siting of the proposed WTG locations was substantially changed so as to avoid herder households from potentially experiencing unacceptable noise generated from the operating WTGs. The WTG Area is located at the southern parts of the land lease area, which corresponds to a closer location to available access to the site and closer to the destination of the TL, thus reducing the requirement for new access roads. This is the final layout which was selected and considered in this ESIA.

3.6.6 PHASED DEVELOPMENT APPROACH

[redacted] To achieve this generation target, the initial solution included the installation of 29 wind turbine generators (WTGs) with a combined installed capacity of 181.25 MW, supported by a 50 MW / 100 MWh battery energy storage system (BESS).

[redacted] In response to this revised demand, the Project configuration was optimized to 24 WTGs with an installed capacity of 150 MW, complemented by a 50 MW / 100 MWh BESS. This optimized configuration is considered the initial development.

The Project Company and OT have, however, acknowledged the potential for future expansion, should OT's energy demand increase or additional offtake opportunities become available. [redacted]

This Environmental and Social Impact Assessment (ESIA) has been prepared to cover the full potential development envelope of the NZE Wind Farm Project—equivalent to the installation of up to 29 WTGs. Therefore, the assessment encompasses both the initial development phase (24 WTGs, 50 MW / 100 MWh BESS) and any future expansion within this predefined capacity and project footprint.

During the effective period of this ESIA, the Project Company will not be required to undertake a new ESIA for the future expansion, provided that the expansion activities remain within the assessed boundaries, technologies, and impact envelope described in this document. Should the future expansion introduce new or materially different impacts, technologies, or land requirements beyond the scope of this assessment, the Project Company will undertake an addendum or targeted supplementary assessment in accordance with applicable national legislation and the Project's Environmental and Social Management System (ESMS).

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