

**East Renewable Energy AB
Syvash Wind Farm
Preliminary Environmental and Social Impact
Assessment - Non-Technical Summary**



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Glossary

Abbreviation or Term	Definition
EBRD	European Bank of Reconstruction and Development
EHS	Environment, Health and Safety
EIA	Environment Impact Assessment
EPC	Engineering, Procurement and Construction
EPs	Equator Principles
ESAP	Environmental and Social Action Plan
ERE-AB	East Renewable Energy AB
ERP	Emergency Response Plan
ESMP	Environmental and Social Management Plan
ESIA	Environmental and Social Impact Assessment
GIS	Geographical Information Systems
Ha	Hectare. Equivalent to an area of 10,000m ²
HGV	Heavy Goods Vehicle
IFC	International Finance Corporation
IUCN	International Union for the Conservation of Nature
LCT	Landscape Character Types
LVIA	Landscape and Visual Impact Assessment
NES	National Environmental Strategy
RDB	Red Data Book. - The IUCN Red List of Threatened Species is a comprehensive, global approach for evaluating the conservation status of plant and animal species.
SEP	Stakeholder Engagement Plan.
VP	Vantage Point when used in the context of ornithological surveys to describe a specific location chosen to undertake bird surveys. Viewpoint when used to describe specific locations used to assess visual impacts.
WMP	Waste Management Plan
WTG	Wind Turbine Generator

1 Introduction

1.1 This Document

This represents a Non-Technical Summary (NTS) of the Environmental and Social Impact Assessment (ESIA) that has been prepared for East Renewable Energy AB (ERE-AB) for the Syvash Wind Farm (the Project). The location of the Project site is illustrated in Figure 1-1.

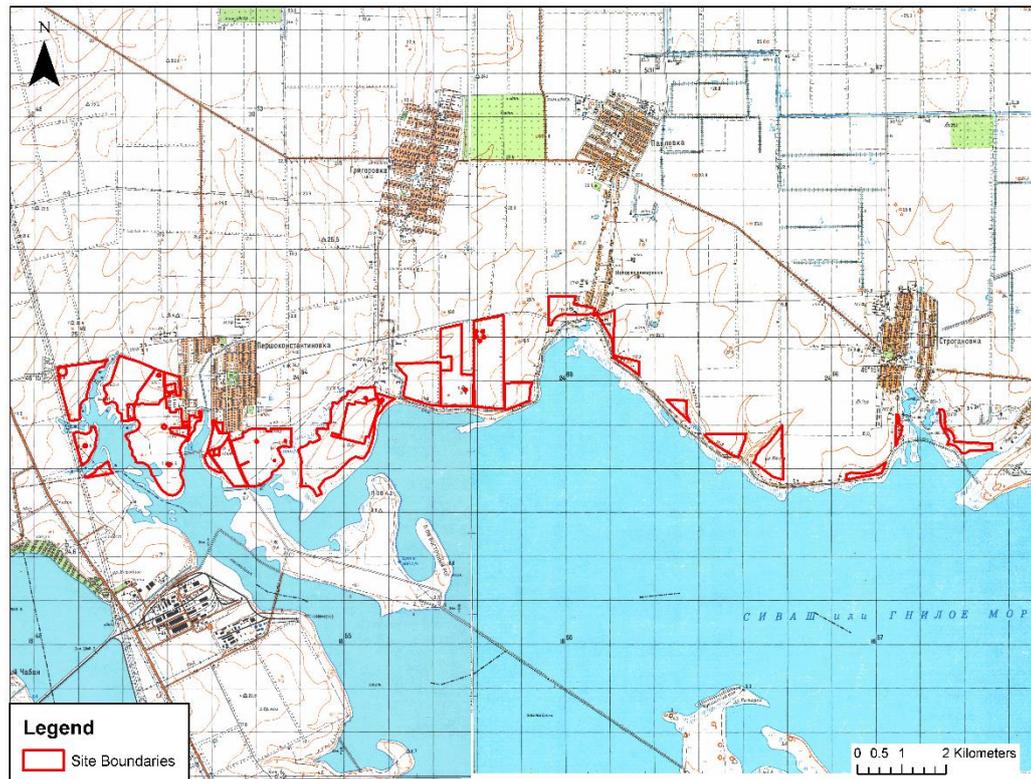


Figure 1-1: Site Location

The ESIA presents information on the identification and assessment of the likely significant environmental and social effects of the Project and its ancillary infrastructure.

The purpose of this NTS is to present key findings from the ESIA in a manner which is accessible to everyone that may be interested in the Project.

1.2 Background to the Project

A wind farm consisting of up to 67 wind turbine generators (WTG), each with an individual capacity of up to 4.2 MW is proposed to be constructed on land within the Chaplynka district in the Kherson region of Ukraine. The Project is currently subject of a layout optimisation process both in terms of environmental and technical constraints. This ESIA therefore considers a worst-case scenario in terms of environmental impact (maximum WTG numbers, elevations and sound power level). It should be noted that the Project maximum capacity is capped at 250 MW, as per the Ukrainian EIA permit and the ESIA has assumed a worst-case scenario of up to 67 WTGs. The Project consists of land plots totalling 1,307.99 hectares leased from reserve lands of Pershokostiantynivska, Hryhorivska, Pavliska and Strohanivska village councils.

It is expected that construction will take place between 2018 and 2019 and, once operational, the Project will supply power to the National Energy Company 'Ukrenergo' State Enterprise grid system.

The ESIA and this NTS will be disclosed to project stakeholders and the public in compliance with the European Bank of Reconstruction and Development (EBRD) guidelines as best practise. All stakeholder and public comments received to date were considered in developing this preliminary ESIA.

1.3 Need for the Project

Renewable energy development in Ukraine is important to provide alternative energy solutions to decrease reliance on fossil fuels and imported energy. The Ukrainian government has developed an Energy Strategy to 2035 setting the target to increase the share of renewables in the energy mix to 25 % by 2035.

To stimulate renewable energy development in Ukraine a feed in tariff was introduced in 2009 and established until 1 January 2030. The National Energy and Utilities Regulatory Commission of Ukraine (the regulatory authority) established a single tariff for all on shore wind energy generation.

1.4 Scope and Content of the Environmental Statement

In order to successfully develop this Project, the following requirements must be met:

- The Project would meet Ukrainian national requirements and international lending standards.
- The Project would include all necessary mitigation measures to minimise any significant adverse change in environmental, health and safety, and socioeconomic conditions.

- Appropriate public consultation and disclosure are undertaken in line with Equator Principles, International Finance Corporation (IFC) Performance Standards and European Bank for Reconstruction and Development (EBRD) Performance Requirements, ensuring all reasonable public opinions are adequately considered prior to a commitment for financing.

To ensure compliance with international lending requirements, the overall scope of this assessment includes:

- Identification of key issues.
- Definition of baseline conditions of key environmental and social resources.
- Assessment of positive and negative impacts of the Project.
- Consultation with people who may be affected by the Project and other stakeholders.
- Development of design and operating practices that are sufficient to avoid, reduce, or compensate for significant adverse environmental and social impacts.
- Development of such monitoring programs as are necessary to verify mitigation is effective in accomplishing its goals, and to develop and refine the effectiveness of mitigation measures.

1.5 Best Practice

The overall approach for the ESIA and reporting were based on IFC Performance Standards and EBRD Performance Requirements. The following sources of guidance were utilised together with additional sources as referenced throughout the text:

- IFC Guidelines, including Environmental, Health and Safety (EHS) *Guidelines for Wind Energy* (IFC, 2015), *General EHS Guidelines* (IFC, 2007), *Draft EHS Guidance for Roads* (IFC, 2006), and *Operational Policy 4.01*.
- EBRD Guidance including E&S Eligibility Criteria for On-shore Wind Power Project.
- European Union Council Directive 85/337/EEC *on the assessment of the effects of certain public and private projects on the environment*, as amended by Council Directive 97/11/EC, Directive 2003/35/EC, Directive 2009/31/EC (Council of the European Union, 1985; 1997, 2003, 2009).

Each of the stages listed in the section above has been completed during the EIA process following the best practice guidelines as closely as possible.

2 Project Description

This is a description of the key project elements; a fuller project description is provided in the ESIA document.

2.1 Site Description

The proposed site comprises approximately 1,307.99 hectares of land within the Chaplynka district in the Kherson region (oblast) of southern Ukraine. The site is located along the northern shores of Lake Syvash and consists of plots leased from reserve lands of Pershokostiantynivska, Hryhorivska, Pavliska and Strohanivska village councils. The southern boundary of the south-western corner of the site lies just north of the Crimean border.

The topography of the site is generally flat. It consists of areas of cultivated land, and sections of the Project area are used by local farmers for cattle and sheep grazing. There are some localised areas of wetland, dominated by reeds. Infrastructure currently located on the site includes large irrigation drains in addition to existing WTGs establishing the presence of renewable energy in the area.

The villages of Novovolodymyrivka, Pershokostiantynivska and Strohanivka are located to the north of the proposed Project site at distances of approximately 700 m from the nearest WTGs.

2.2 Site Layout

The final Project layout and final WTG to be installed on site is yet to be determined. This ESIA therefore assesses the impacts of an indicative, worst case, layout at the Project site, presenting the maximum number and dimensions of WTGs. The maximum capacity Project will 250 MW. The proposed layout has been selected with the aim of minimising conflicts with existing roads, residential areas and on-site constraints. The proposed Project will comprise up to 67 WTGs each with a maximum capacity of up to 4.2 MW. The indicative WTG layout is shown in Figure 2-1.



Figure 2-1: Proposed WTG Layout

2.3 Summary of Key Components

The proposal is for the construction, operation, and decommissioning of a wind farm comprising the following components:

- Access road from paved highway to the Project site.
- Grid connection and substation.
- On-site access roads from the control centre to the WTGs and underground cables to carry electricity from the WTGs to the substation.
- Construction compound.
- Control room.
- 67 WTGs.

2.4 Other Wind Farm Developments in the Area

A review of wind farms within a 60 km radius of the Project site will be undertaken. Those identified are shown in Figure 2-2. Note that the Syvash project is at the centre of the image.

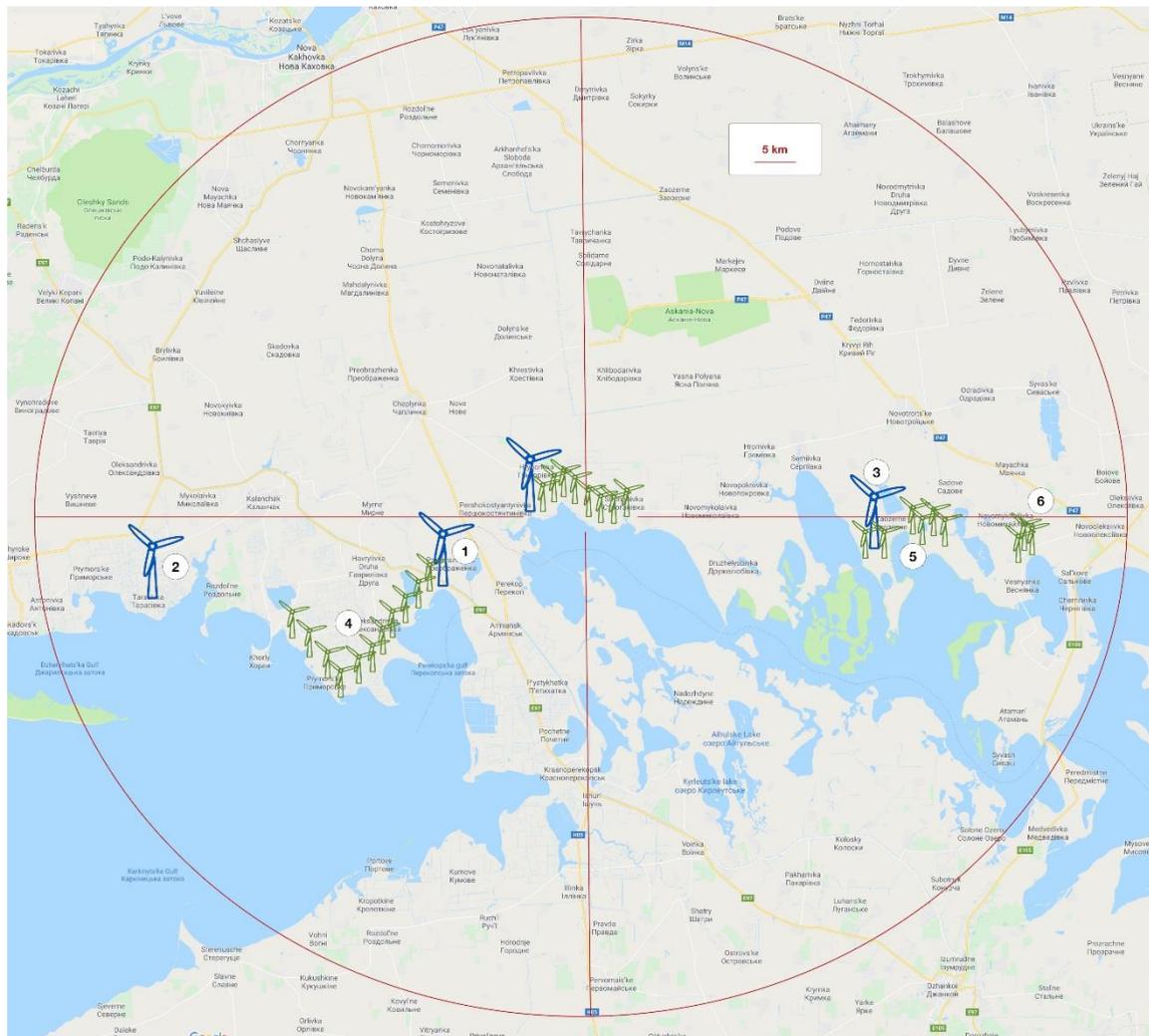


Figure 2-2: Cumulative developments within 60 km of the Project

A full cumulative assessment will be completed during the 60 day disclosure period to consider the impacts of this project together with others that are operational, under construction or at the development stage.

2.5 Protected Sites

A total of three protected sites were identified within a 30 km radius of the Project (Figure 2-3). The three sites are:

- National Biosphere Reserve Zapovednik
- Azovo-Sivashskiy National Park
- State Zakaznik



Figure 2-3: Protected Sites within 30 km of the Project

3 Assessment Methodology

The impact assessment considered the condition of the existing environment (the baseline conditions), the impact of the environment that would occur from the construction and operation of the wind farm, how these impacts could be reduced (or mitigated) and the residual impact after the mitigations have been implemented.

3.1 Environmental Monitoring

Where there is uncertainty over the potential significance of an impact, mitigation may include monitoring of that impact to determine whether additional measures are required. It is recommended that Project monitoring be described in a corresponding Environmental and Social Management Plan (ESMP), a framework ESMP accompanies the ESIA.

3.2 Scope of ESIA

It is proposed that air quality impacts do not need to be considered in the ESIA due the fact that the Project will have negligible emissions during normal operation. Air quality issues such as dust emissions during construction will be considered as part of the assessment of construction impacts and managed as part of the ESMP.

4 Landscape and Visual Impact Assessment

4.1 Baseline

The landscape is dominated by the Syvash, Europe's largest shallow salt-water bay (lagoon of the Azov Sea). The Syvash is one of the most valuable territories within the Azov-Black Sea ecological corridor and Europe as a whole.

Inland from the Syvash the land is primarily used for large scale arable farming. The principal crops are wheat and other grain crops, sunflowers and soya. Across this area irrigation infrastructures are present in the form of large drains and associated irrigation equipment. Field sizes are very large with sparse/scattered deciduous trees marking some field boundaries. No significant areas of woodland were noted in the vicinity of the wind farm and surrounding area. Housing in this area is concentrated in distinct settlements with no single farm buildings present outside of the towns and villages.

The following landscape character types (LCTs) have been identified within the Project's area of influence.

- Syvash-Pryazovia lowland steppe.
- Syvash lake.
- Small villages and settlements.

4.2 Key Potential Impacts and Mitigation

4.2.1 Operation

Potential landscape and visual impacts primarily arise during operation of the wind farm primarily as a result of the erection of the WTGs.

The potential visual impacts were assessed based on views from six representative viewpoints. The impacts experienced from five of the six receptors are assessed as not significant and therefore no specific mitigation is considered. Only the closest receptor has been identified as experiencing a Moderate Adverse impact.

For all LCTs the greatest impacts would be experienced during operation, particularly at distances of less than 10 km from the proposed site. However, the presence of existing industrial facilities, overhead lines and operation wind turbines of varying scales, both reduces the sensitivity of the LCTs, and provides adequate capacity to absorb this level of impact without materially affecting the key characteristics of each LCT. Therefore, the magnitude of impact is likely to be Medium at distances of up to 10 km reducing to Low at further distances. As a result, the significance of the impacts on all LCTs is Slight and not significant.

Mitigation options are fairly limited during operation and would be focused on the full implementation of the community benefits package to ensure that any visual impacts on the local population is offset by an appropriate level of community benefit.

4.2.2 Construction and Decommissioning

Potential landscape and visual impacts during construction and decommissioning are temporary and medium term with the significance being Slight and not significant. These impacts are reasonably easily mitigated through “good house-keeping” to keep the site tidy and considerate construction practices such as restricting vehicle movements to surfaced roads.

5 Plants, Animals and Habitats

5.1 Baseline

An assessment of impacts on plants, animals, and habitats (collectively referred to as terrestrial ecology) was undertaken. There are no designated sites included within the search area around the Project that are designated specifically for their value for terrestrial ecology or terrestrial receptors they support.

The habitats present within the Project site are farmland, fallow fields and grassland all of which have been subject to various levels of human disturbance.

It is assumed that large mammals including Wild Boar, Deer and Eurasian Otter could be present within and/or adjacent to the Project based upon species range. Eurasian Otter are listed as Vulnerable in the National Red Data Book, Near Threatened by the IUCN and are also included on Annex II of the EU Habitats Directive.

Reptiles and amphibians such as toads, frogs, lizards and snakes were identified on the site. Four species of snake identified (or assumed to be present) within the study area are listed as Vulnerable in the Ukraine Red Data Book.

Habitats on the site, such as trees in shelter belts and buildings, are considered to be suitable for bats. A total of 14 bat species were identified within and adjacent to the wind farm. The most frequently recorded bats were Common Noctule, Kuhl's & Nathusius' Pipistrelle and Parti-colored bats

5.2 Key Potential Impacts and Mitigation

Potential impacts on terrestrial ecology are primarily anticipated during the construction phase of the Project.

Potential construction stage impacts on flora and habitats include the following:

- Direct loss of vegetation and habitat (including food sources).
- Indirect impacts associated with construction include potential pollution of water courses and or other areas of higher habitat value as well as disturbance of fauna as a result of construction activities, noise, lighting and movement of vehicles and people.

Unmitigated, the potentially negative impacts of pollution on habitats and flora of Project are considered to be of low to moderate significance.

The following mitigation will be adopted to address these potential impacts:

- Avoidance of habitats that support fauna receptors of moderate to high sensitivity.
- Speed limits enforced on the construction site.
- Clearly sign any animal crossings during construction and, if necessary, employ additional mitigation to reduce conflict with on-site traffic.

- Enforcement of standard pollution control measures during construction such as storage of fuel and lubricants in double-bunded containers and ensuring availability of spill kits in appropriate locations.
- No hunting or collecting of flora or fauna within the Project area.
- Shelter belts protected from felling and / or collection of fire wood by construction areas.
- Prohibit setting fire to woodland areas and / or meadow habitats.
- Maintenance of excellent house-keeping practises and high levels of recycling.

Potential construction phase impacts on fauna (excluding birds) include the following:

- Disturbance of fauna from presence of people, machinery, traffic, and noise.
- Indirect impacts associated with pollution incidents could affect habitats and breeding sites. This is of low to moderate significance.
- High sensitivity bat species could be indirectly affected through noise disturbance and/or lighting impacts considered to be moderate to high significance.

Construction phase mitigation in relation to species and habitats will also address the potential impacts identified here in relation to fauna.

The operation of the wind farm will not result in impacts on habitats and flora of designated sites or habitats and flora present within the Project site.

Operational impacts are limited to disturbance and/or killing and injuring of fauna as a result of operational traffic around the site. It is also possible that the operational WTGs will result in killing and injuring bats through collision impacts and barometric trauma.

Mitigation measures adopted during operation will include:

- Enforcement of speed limits on site.
- Monitoring of road conditions and any damages repaired.
- Maintenance of any animal crossings.
- Completion of carcass searching programmes for at least three years of operation.
- Additional bat surveys recommended to further inform potential mitigation.
- Maintain the ban on hunting and collecting of firewood.
- Prohibit fires to wooded areas or meadow habitats.
- Implement enhancements where possible including increasing the quality and amount of wet meadow habitat and improving woodland areas.

Similar to construction, the main impacts during decommissioning are likely to comprise habitat loss, loss of small numbers of faunal species as well as disturbance impacts. Following decommissioning, reinstatement will be important to re-establishing more natural meadow habitats across the site previously occupied by WTGs, site roads and other structures. Similar mitigation to that described in relation to the construction phase will be adopted during decommissioning.

5.3 Further Work

Further survey work is required to better inform adaptive management strategies to reduce potential impacts, this includes:

- Pre-construction habitat survey.
- Pre-and during construction amphibian surveys.
- Pre-operational bat surveys (between May and October).
- Pre-construction otter surveys.

5.4 Residual Impacts

Provided that the proposed mitigation measures are fully and successfully implemented, the overall effect of the Project on species and habitats will be low adverse to not significant in the long-term. Taking in to consideration proposed enhancements to the site it is considered that if this is achieved the Project will result in a positive impact of low to moderate significance.

6 Bird Impacts

6.1 Baseline

The following protected areas were identified which are important areas for birds:

- Karkinit's'ka and Dzharylgats'ka Bays IBA, 10 km south-south-west of the Project site.
- Askania Nova Biosphere Reserve, 23 km north of the Project site.
- Syvash Bay IBA, 24 km south-east of the Project site.

Each of which have populations of bird species, some of which are listed as being of conservation concern on the IUCN Red List.

Baseline data for the Project area was collected by the Melitopol State Pedagogical University. Over the course of spring migration surveys in 2013, 2015 and 2017, 48 notable species were recorded. These included five species of conservation concern (IUCN status given in brackets):

- Common Pochard (Vulnerable).
- Red-footed Falcon (Near Threatened).
- Northern Lapwing (Near Threatened).
- Black-tailed godwit (Near Threatened).
- Bar-tailed godwit (Near Threatened).

During Autumn migration surveys undertaken in 2017, 22,976 individuals of 51 species were recorded of which 69% were in buffer zones and adjacent territories and 31% within wind park area. Most numerous on the Project site were rook, barn swallow, ruff and black-headed gull; totalling 16,002 individuals (70% of total birds) within the Project. 79% of registered flights were up to 25m with 20% of flights between 26 and 50m and virtually no flights above 50m.

Breeding bird surveys have been completed within and/or in the vicinity of the proposed wind farm in 2013, 2015 and 2017. 2017 breeding bird surveys were conducted from the end of March to May. In 2017 a total of 37 species and 638 nests were recorded, although just 12 species were observed in the area of the Project with 38 nests confirmed. Largest numbers of nests were for great reed warbler, which are common in the region. Over 100 individuals of Caspian gull were recorded in colonies in Syvash area near Strohanivka. Three pairs of red-footed falcon bred within the Project site and a further eight pairs in immediately adjacent areas. Four Red Book of Ukraine species, glossy ibis (15 pairs), red-crested pochard (2 pairs), black-winged stilt (2 pairs) and oystercatcher pairs) were recorded. None were confirmed as nesting within the Project area, although they were present in wetland habitats immediately adjacent. Agricultural habitats within the Project area were confirmed as being suitable for breeding demoiselle crane but none were recorded during the surveys.

Wintering bird surveys have been completed within and/or in the vicinity of the proposed wind farm in 2013, 2015 and 2017. In 2017 a total of 11,189 individuals of 30 species recorded but only 165 individuals recorded within Project site, which was attributed to poor food supply. Most numerous birds within Project site were mallard (70) and common starling (40). Four Red Book Ukraine species were recorded: ruddy shelduck, hen harrier, white-tailed eagle and lesser short-toed lark

6.2 Assessment of Impacts and Mitigation

There are three ways in which the Project may have an adverse effect on birds: direct loss of habitat; increased mortality rate through collision with WTGs; and loss of habitat through disturbance.

Construction impacts are likely to include habitat loss and possible nest destruction for passerine and ground nesting bird species as well as disturbance impacts in the Project and adjacent areas.

Potential impacts during operation of the Project include disturbance of birds from WTG operation and loss of birds from collision with WTGs.

WTGS will be constructed to avoid areas of highest quality habitats and if possible buffer zones between wet grasslands and marshes should be set in order to ensure these areas can be used during periods of migration and or staging. Habitats that are being lost to construction activity should be removed outside of the breeding bird season (March to August) and if this is not possible after a check has been completed by the on-site ecologist to ensure that breeding birds are not directly affected by construction.

Potential impacts during operation of the Project include disturbance of birds from WTG noise, shadow flicker, people, and traffic and loss of birds from collision with WTGs. During operation it is considered likely that the Project site is subject to levels of migratory and wintering bird activity that would merit operational mitigation and monitoring for a minimum of three years.

Enhancement measures are also proposed to include installation of nesting boxes and development and enhancement of wet meadow habitat and shelter belts / small copses.

6.3 Further Survey and Assessment

Spring migration surveys are currently being completed in Spring 2018 until the end of May 2018. A supplementary report will be prepared setting out the survey results, impact assessment and outlining appropriate mitigation.

Further surveys are proposed during autumn and winter of 2018, the results of which will be used to further inform and iterate recommended operational mitigation and monitoring.

6.4 Residual Effects and Conclusions

Provided that the proposed mitigation measures are fully and successfully implemented, the overall effect of the Project on species and habitats will be low adverse to not significant in the long-term. Following decommissioning, reinstatement will re-establish the ecosystem in the areas previously occupied by the WTGs, site roads and other structures.

Taking in to consideration proposed enhancements to the site it is considered that if this is achieved the Project will result in a positive impact of low to moderate significance.

7 Hydrology and Hydrogeology

7.1 Baseline

The Project site is located in close proximity to the Gulf of Central Syvash water body. No major water courses / rivers are identified within the site boundary. Within the Project site, surface water is characterised by artificial ponds, drainage channels (Figure 7-1), streams and marsh / wetland areas (Figure 7-2) with excess moisture. Irrigation infrastructure is present in the form of large drains and associated. Localised wetland areas are present on the low lying coastal areas of the site.



Figure 7-1: Drainage / Irrigation Channel



Figure 7-2: Typical Ponding / Wetland Area

Detailed topographical surveys and ground investigations are currently being carried out on site. The baseline will be updated once information becomes available.

There is a high water consumption in the region from irrigation systems for agricultural operations. There is one ground water well in place associated with the existing wind farm on site and is located adjacent to the current operations building.

There is a high water consumption in the region from irrigation systems for agricultural operations. Two further ground water wells are located within the site boundary associated with irrigation uses.

Average precipitation is in the region of 400 mm. Most of the precipitation occurs in summer as rainfall. During winter in the coastal area snow fall typically amounts to approximately 15 days.

Hydrogeological conditions at the Project site are characterized by the presence of subterranean waters at the level approximately three to four meters above the Syvash water level. Shortage of fresh groundwater is a key issue in the Kherson region due to current irrigation practices, aquifer overexploitation and a complex of natural conditions.

The WHO has developed a flood hazard map for the Ukraine region¹. The Project site is located predominately within an area of low flood risk, with some areas of higher risk of flooding identified associated with surface water bodies feeding into the Syvash Bay.

¹ <http://data.euro.who.int/e-atlas/europe/images/map/ukraine/ukr-flood.pdf>

7.2 Key Potential Impacts and Mitigation

Potential impacts on water resources are primarily associated with the construction phase of the Project but can occur to a lesser extent during operation and decommissioning. Potential impacts include:

- Water consumption, potentially affecting local water resources.
- Alteration of surface and groundwater flow as a result of construction earthworks, road construction and use of heavy vehicles.
- Water discharge and pollution.

Micro-siting of WTGs and Project infrastructure will be undertaken during the detailed design process to maintain an appropriate buffer distance (50 m recommended) from any hydrological features on site.

To reduce the potential for erosion of drainage channels during road construction, routes should be selected to avoid existing drainage channels where possible. Culverts or other drainage control features should be installed where crossings of drainage routes are unavoidable. Vehicle movements should be restricted to defined routes and sealed tracks.

Standard pollution control and waste management measures will be enforced during all stages of the Project to prevent pollution of hydrological and hydrogeological features.

A water availability / resource use assessment and management plan will be developed to confirm construction and operational phase water requirements and the capacity of the proposed supply to meet these requirements without adversely affecting existing users.

During decommissioning, after roads or other compacted areas have been removed and / or abandoned, previously compacted soils will be dug-up/loosened native grass seeds planted. This should be monitored and repeated until reclamation is successful for at least two growing seasons after the last planting / seeding.

7.3 Residual Impacts

With the implementation of mitigation measures outlined above, it is considered that there will be no significant residual impacts on the water environment.

8 Geology and Soils

8.1 Baseline

The Project site is predominately of flat terrain, absolute heights vary between 6 and 21 m above sea level. In the south and especially in the south-east, the flatness of the surface is disturbed by the pools (their depth is of 6-8 m (sometimes up to 15 m)) and gullies (the depth of their inlets reaches 10-15 m).

Soils in the Project area are identified as vulnerable to erosion. In particular, soil erosion caused by vehicles on unimproved tracks and water erosion that occurs during the winter period.

From review of Mineral Resources of Ukraine online databases no records of mineral resources have been identified on the Project site area.

8.2 Key Potential Impacts and Mitigation

The most significant impacts on soils have been assessed as occurring during construction as a result of vehicle traffic, topsoil stripping, use of heavy equipment and blasting. However, soils will remain vulnerable during the operation phase. Soils are assessed as a medium sensitivity receptor.

Soil compaction and loss of vegetation as a result of vehicle movement (particularly when vehicles drive off-road) and other construction activities on the site, increases the soils' vulnerability to erosion. During operation and decommissioning there should be no requirement for vehicles to drive off-road due the presence of prepared on-site roads built during the construction phase. The main risks during these later stages are associated with vehicles leaving the prepared roads and driving cross-country.

There is also potential for soils to be contaminated by waste.

Proposed mitigation measures are as follows:

- Clearly demarcate storage and staging areas and store all materials, equipment and vehicles in demarcated area to reduce soil damage. Furthermore, vehicles should be confined to demarcated roadways.
- Establish native grasses in erosion control channels and in other areas immediately after final disturbance.
- Salvage and store topsoil and subsoil before areas are excavated, with topsoil stripped and stockpiled separately.
- Segregate excavated soils into stockpiles dependant on material type and provide erosion control while stockpiled.
- On completion of earthworks, backfill material in the same stratigraphic sequence.
- When wide roads are narrowed after WTG construction, dig-up and loosen soils in previously compacted areas and establish native grasses.

- Once construction and road-building are complete, dig-up and loosen soils in areas compacted by off-road vehicle / equipment movements and establish native grasses.
- Store all materials within designated areas of temporary storage facilities and provide supplies to clean-up of minor spills.
- Confine all vehicles and equipment to the roadway and, to extent possible, minimize activities during wet conditions. When activities must occur in wet conditions, control storm water by using fabric, straw bales and other measures to impede storm water flow and prevent erosion.
- When damage to wet soil occurs, repair once dry conditions return.
- For storage of oil, establish a designated storage area, with impervious base and impermeable bund walls. Capacity must be sufficient to contain full volume within a bund and secured area.
- Store all fuel, oil and chemical storage in the designated storage area.
- Check hoses and valves regularly for signs of wear and ensure they are turned off and securely locked when not in use.
- Place diesel pumps and similar items on drip trays to collect minor spillages. Check trays regularly and remove any accumulated oil.
- Reduce the amount of waste to the maximum extent possible.
- Collect all solid waste and store until transported to the designated disposal site.

During decommissioning, after roads and other compacted areas are removed and / or abandoned, soil should be dug-up/loosened and native grass seeds planted.

8.3 Residual Impacts

Impacts should be relatively short in duration, lasting only through construction of the WTG foundations and the roads. Following implementation of mitigation measures, no significant effects are anticipated.

During operation, impacts on soils are less significant and mainly confined to continued vehicle traffic. With mitigation implemented, these risks should be reduced, resulting in minimal residual impacts.

9 Archaeology and Cultural Heritage

9.1 Baseline

The Office for Cultural Affairs of the Kherson District State Administration confirmed that the following monuments are present within the Project area:

- 10 monuments - 1.2 m - 3.2 m high mounds, 25-40 m in diameter, respectively; on the territory of the Hryhorivka village council: ten 0.8-2.8 m high mounds, 20-30 m in diameter,
- A mound group, consisting of three mounds. The height of the mounds is - 1.4, 1.5 and 0.9 m, 29, 32 and 30 m in diameter, respectively.

The identified mounds have been excluded from the site boundary to ensure no direct impacts occur.

Further features were identified during the site visit outwith the site boundaries, including a war memorial and grave sites located to the south of Novovolodymyrivka. A cemetery is also present to the south of Pershokostyantynivka.

9.2 Key Impacts and Mitigation

As a result of the presence of known archaeological, religious and aesthetic sites within close proximity to the Project site boundary, the site sensitivity is assessed to be Medium. The magnitude of direct impact on known features is assessed as Low, due to appropriate exclusion zones having been applied to identified features. Therefore, the impact significance is Low and not significant.

Due to the presence of archaeological features within the area there remains the potential to uncover previously buried archaeology (chance finds) during construction works. The magnitude of impact on unknown features is assessed as Medium therefore the impact significance is Moderate and significant.

Detailed archaeology surveys are currently being carried out on site. The results of this survey will be fed into the detailed design process for the Project with infrastructure micro-sited to ensure that direct impacts on any additional archaeological or cultural heritage features are minimised.

A cultural heritage management plan will be developed. This will outline actions and measures necessary for the effective management of risks and impacts to cultural heritage during all phases of the Project.

A chance find procedure will be developed. This will be applied in the event that previously unknown features of archaeological/cultural heritage importance are discovered. ERE-AB or its contractors will not disturb any chance find further until an assessment by a competent professional is made and appropriate actions identified.

9.3 Residual Effects

With mitigation, it can be concluded that there would be no significant impacts associated with cultural heritage as a result of the Project.

10 Noise

10.1 Introduction

This chapter considers the likely significant effects in terms of noise of the Project WTGs at noise sensitive receptors (NSRs).

Construction noise effects are normally of a temporary nature and result from both moving and static sources. Assessment allows the temporary impact of construction noise to be understood and for suitable mitigation measures to be identified to minimise any potential adverse effects.

When operational, WTGs emit two types of noise – mechanical noise and aerodynamic noise. The main sources of mechanical noise are from internal components housed within the nacelle, such as gearbox and generator. Mechanical noise from a modern WTG is negligible as designs are highly refined. Aerodynamic noise occurs from the movement of the blades passing through the air. At high wind speeds, that aerodynamic noise is usually masked by the increasing sound of wind blowing through trees and around buildings, and turbulent noise within the air itself. The level of masking determines the perceived audibility of the wind farm. The noise impact assessment establishes the relationship between WTG noise and the natural masking noise and assesses levels against established standards.

Noise propagation has been modelled in accordance with International Standard ISO 9613-2: 1996 Acoustics – Attenuation of Sound Propagation Outdoors – Part 2: General Method of Calculation².

The impact of operational noise has been assessed in accordance with the IFC Environmental, Health, and Safety (EHS) Guidelines for Noise Management³, along with ETSU-R-97⁴, taking cognisance of the most recent good practice guide (GPG) of the Institute of Acoustics⁵, and Supplementary Guidance Notes⁶.

² International Standard ISO 9613-2: 1996, *Acoustics – Attenuation of Sound during Propagation Outdoors*

³ International Finance Corporation - Environmental, Health, and Safety (EHS) Guidelines, *Noise Management*, 2007

⁴ ETSU-R-97 (2007) *The Assessment and Rating of Noise from Wind Farms*, ETSU for the Department of Trade and Industry

⁵ *A Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise*, Institute of Acoustics, May 2013

⁶ *A Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise*, Supplementary Guidance Notes 1-5, November 2013 - September 2014

10.1.1 Construction Phase

Construction noise effects are normally of a temporary nature and result from both moving and static sources. Assessment allows the temporary impact of construction noise to be understood and for suitable mitigation measures to be identified to minimise any potential adverse effects.

10.1.2 Operations Phase

When operational, WTGs emit two types of noise – mechanical noise and aerodynamic noise. The main sources of mechanical noise are from internal components housed within the nacelle, such as gearbox and generator. Mechanical noise from a modern WTG is negligible as designs are highly refined. Aerodynamic noise occurs from the movement of the blades passing through the air. At high wind speeds, that aerodynamic noise is usually masked by the increasing sound of wind blowing through trees and around buildings, and turbulent noise within the air itself. The level of masking determines the perceived audibility of the wind farm. The noise impact assessment establishes the relationship between WTG noise and the natural masking noise and assesses levels against established standards.

10.2 Baseline

The operational noise of wind farms is assessed by comparison with the existing background noise (BGN). BGN is usually measured in the external amenity of nearby NSRs. Measurements are made in ten-minute intervals over an extended period.

BGN monitoring was undertaken at a total of four locations representative of settlements in close proximity to the Project. BGN was measured for two weeks between 29 March 2018 and 12 April 2018 at Pweahokoatyantynivka (Location A), Hryhorvika (Location B), Novovolodymyrivka (Location C) and Strohanivka (Location D). Measurements were made in accordance with best practice set out in ETSU-R-97.

The measured noise levels at 10-minute intervals have been correlated with the wind speed measurements at the same 10 minute intervals standardised to a height of 10m. IFC EHS guidelines, on which the Project WTGs operational noise assessment is based, use one hour L_{Aeq} (dBA). On review of the data obtained, it was decided that the guidance of ETSU-R-97 (UK) provides the most accurate description of background noise at the site.

Table 10-1: Background Noise Levels⁷

Receptor	Location A		Location B		Location C		Location D	
	Quiet Day	Night-time						
4	33.8	28.5	30.3	24.9	35.0	32.9	33.8	28.5
5	36.0	30.6	31.8	26.4	36.7	34.0	36.0	30.6
6	39.0	33.0	33.6	28.7	38.7	35.8	39.0	33.0
7	42.6	35.5	35.9	31.9	41.0	38.2	42.6	35.5
8	46.9	35.5	38.5	31.9	43.7	38.2	46.9	35.5
9	46.9	35.5	38.5	31.9	43.7	38.2	46.9	35.5
10	46.9	35.5	38.5	31.9	43.7	38.2	46.9	35.5
11	46.9	35.5	38.5	31.9	43.7	38.2	46.9	35.5
12	46.9	35.5	38.5	31.9	43.7	38.2	46.9	35.5

10.3 WTG Noise Emission Data

As the specific WTG model to be implemented for the Project is still under consideration, it has been agreed that the modelling will be based on the WTG input from the worst case sound power level. The operational noise has been assessed based on the input noise levels emitted from Vestas type V136-3.45MW WTGs, using information supplied by manufacturer specification documents for Mode 0 (full power) between 6 and 10 m/s.

10.4 Key Impacts and Mitigation

The assessment showed that the predicted levels for total operational noise only exceed the limit at Location A. There the night-time limit of 43 dB is exceeded for wind speeds between 6 and 9 m/s by a maximum 0.6 dB at 7 m/s (see Table A3 and Figure A18). All other NSRs meet the day-time and night-time limit criteria. For Location A the effect is assessed as significant, for all other NSRs the effect is assessed as not significant. This assessment was conducted as a worst case conservative approach.

⁷ Noise levels assessed as $L_{A90} + 2$ dB, (Approximate L_{Aeq})

10.4.1 Construction Mitigation

Construction activities will be scheduled, unless otherwise agreed, from Monday to Saturday 0600 to 2000. Unattended plant equipment should be kept to a minimum. Construction activities outside of these times, short term high transient noise events, or activities relatively close to NSRs should be scheduled in consultation with the residents to minimise their inconvenience.

The contractor should produce and implement a Noise Management Plan for the construction phase.

10.4.2 Operational Mitigation

At the stage of this preliminary worst case scenario assessment, mitigation would be required where the night time limit of 45 dB is breached at Location A. Where additional exposure levels at NSRs equate to an increase of 10 dB or more by, it is recommended that mitigation be considered. An increase of 10 dB or more is an indication of significant adverse impact.

As previously stated, the applicant intends to conduct a revised assessment for any changes in the WTG type or layout. Additional modelling when the final WTG model and type has been decided would be able to accurately assess the need for mitigation curtailment, and the specific schemes available to reduce the impact effects.

It may be necessary that a number of WTGs will need to be run in a curtailed mode for specific wind speeds at night to reduce the additional exposure at NSRs. For Location A, it would be necessary to run some of the WTGs in a curtailed mode during night-time between wind at wind speeds between 6 - 9 m/s, to ensure levels below 45 dB at night. In addition, curtailment should be implemented at speeds between 4 - 6 m/s to ensure maximum increase above background levels do not exceed 10 dB. For Location D, it would be necessary to run some of the WTGs in a curtailed mode at a wind speed of 4 m/s to ensure levels do not exceed background by 10 dB.

11 Shadow Flicker

11.1 Introduction

This chapter presents an assessment of the shadow flicker effect of the development on nearby sensitive receptors. The assessment considers shadow flicker effects from the operation of the proposed wind farm.

Shadow flicker occurs during the operational phase of a wind farm when the sun passes behind the WTG and casts a shadow. As the rotor blades rotate, shadows pass over the same point causing an effect termed shadow flicker. Shadow flicker may become a problem when potentially sensitive receptors (residential properties, workplaces, learning spaces and health care settings are all potentially sensitive to shadow flicker) are located near, or have a specific orientation to, the wind farm.

Limits on shadow flicker are applied primarily to avoid nuisance and preserve amenity. It is generally accepted that there are no health or safety concerns associated with shadow flicker. The IFC Environmental, Health and Safety Guidelines for Wind Energy (2015) recommend the use of the 30 hours per year and 0.5 hours per day limits for shadow flicker, based on worst-case scenario modelling.

11.2 Baseline

The identification of potential shadow flicker receptors was based on inspection of topographical maps, satellite imagery and the site visits undertaken in March 2018. Identified residential areas are shown in Figure 11-1.

11.3 Key Impacts and Mitigation

Shadow flicker impacts were predicted, based on 67 WTGs with a rotor diameter of 136 m and a hub height of 112 m, using the Shadow Flicker module of the ReSoft WindFarm software. The WindFarm analysis reports the 'worst case' scenario, directly comparable with the limits provided in the IFC guidance.

Using the WindFarm software, a potential shadow flicker impact area map was produced based on the assumption that shadow flicker impact is negligible beyond a distance of 10 rotor diameters (1360 m). This is shown in Figure 11-1.



Figure 11-1: Predicted Shadow Flicker Impact Zone (shading illustrates areas predicted to experience over 30 hours of shadow flicker per year)

A number of residential properties (approximately 115 properties based on the worst case layout) are predicted to experience shadow flicker effects in excess of the limits within the IFC guidance. Consequently, a procedure will be put in place to mitigate potential impacts.

If any complaints are raised by the local community (through the grievance mechanism or other channels) relating to shadow flicker from the wind farm, the wind farm operator shall investigate and instigate, at their own expense and within one month of being advised of the complaint, appropriate measures to mitigate the shadow flicker effects.

Measures to mitigate shadow flicker effects in the first instance include provision of additional screening or provision of window blinds at the affected receptor. Should this not adequately address impacts WTGs will be programmed to shut-down during periods when shadow flicker is predicted to occur at the affected receptors in order to ensure impacts are reduced.

Should changes be made to turbine model or project layout the shadow flicker assessment will be re-done and any required mitigation will be implemented.

11.4 Residual Effects

Shadow flicker effects are predictable and easily mitigated. Consequently, with the adoption of the above proposed mitigation strategy, no residual effects are anticipated.

12 Transportation and Access

12.1 Introduction

This Chapter describes the likely effects of the Project including a description of the access route and the likely extent of highway works along the route, and presents the assessment of the significance of these effects.

12.2 Baseline

12.2.1 Transport Route

It is envisaged that the WTG components will be shipped to Mykolaïv Port however it is also considered that Odessa Port could be a potentially suitable alternative. The total distance from port (Mykolaïv) to site is approximately 270 km with a journey time of 4 to 5 hours (longer for abnormal load deliveries).

The roads leading to the site are in poor condition and would need to be upgraded to accommodate HGVs and abnormal loads. The typical state of the roads is illustrated in Figure 12-2. Traffic volumes are typically low and consist predominately of car traffic with very limited HGV traffic observed in the Project region.



Figure 12-1: Road Condition leading to Site (T2206)

12.2.2 Roads on Site

There are some existing unpaved dirt tracks on site however these will need to be upgraded to accommodate construction works (see Figure 12-2).



Figure 12-2: Typical Existing Site Road

12.3 Key Potential Impacts and Mitigation

Significant transportation and access impacts are primarily associated with the construction phase of the Project and include:

- Impact of the Project HGV / abnormal load traffic during construction on the existing road.
- Increased total daily traffic flow on the local road network.
- Damage to road edges and general 'wear and tear' of the road may occur through increased HGV movements.

The transportation of abnormal loads from Nikolaev Port in Mykolaiv to site is likely to require works to be carried out particularly when the loads reach the T2206. Once the transportation route is finalised, a full transport study will be required to identify potential pinch points, constraints and further works requirements.

A Construction Transport Management Plan (CTMP) will be developed to manage potential impacts on the road network and its users.

12.4 Further Work

The proposed transportation route for the delivery of WTGs needs to be assessed and finalised. It is recommended that the route, particularly where it crosses any bridges, be verified through further assessment (including site swept path analysis and route inspection). Furthermore, the method of transportation for other materials and equipment should be verified through further studies.

12.5 Residual Impacts

The effect of the Project's construction HGV / abnormal load traffic on the existing roads cannot be quantified given the lack of traffic data however, considering all construction traffic and proposed mitigation, the impact is likely to be of Minor to Moderate significance during construction and Negligible during operation.

13 Social Impact Assessment

13.1 Introduction

This chapter sets out details of information disclosure, consultation and participation that have been undertaken as part of the ESIA process and assesses the potential socio-economic impacts of the Project and associated works.

13.2 Information Disclosure, Consultation and Participation

This section details the information disclosure, consultation and participation activities undertaken as part of the ESIA process, the outcomes of these activities and details of additional activities planned throughout the planning process.

13.2.1 ESIA Consultation Activities to Date

Six meetings have been held with local communities and groups. The primary goals of these meetings were to:

- Describe the proposed Project and ESIA process.
- Discuss and identify potential Project impacts associated with the construction and operation of the wind farm.
- Understand local land use, activities and populations living and working within or near the Project site.
- Identify the most effective ways of information dissemination in the future.
- Develop a list of stakeholder groups and local people most likely to be affected by the Project.

The key topics that came out of the above meetings were in relation to queries regarding how the wind farm would benefit local communities in terms of employment opportunities and upgrade of infrastructure; affect grazing land available to local livestock farmers; and how the development would affect human health.

13.2.2 Future Consultation Activities

Additional consultation activities are proposed as the Project progresses. ERE-AB would seek to undertake the following at a minimum:

- Disclosure of Preliminary ESIA at locations accessible to local communities and other stakeholders. Provision of Preliminary ESIA on ERE-AB website. Documents to include ESIA Non-Technical Summary.
- Invite comment on Preliminary ESIA.
- Disclosure of Final ESIA to local communities and other stakeholders. Provision of Final ESIA on the SyvashEnergProm website.
- Preparation and disclosure of a Stakeholder Engagement Plan (SEP) to include setting out future community /stakeholder consultation.
- Implementation of Grievance Mechanism to be in place throughout construction, operation and decommissioning of the wind farm.
- Disclosure of monitoring reports.

A Project Community Health and Safety Plan will also be developed. This will describe the potential hazards of the Project during construction and commissioning to local communities and how these will be controlled. The document will also outline emergency preparedness and response along with a grievance mechanism to ensure that feedback is acknowledged and addressed appropriately.

In addition, a Grievance Mechanism will be developed for worker grievances to raise reasonable workplace concerns.

13.3 Baseline

13.3.1 Population and Demographics

Communities located within approximately 5 km of the Project site include: Pershokostyanivka, Hryhorivka, Pavlivka, Novovolodymyrivka, Strohanivka and Ivanivka.

The primary employment sector within the local communities and the greater Chaplynka district, is agriculture: more than 78% of the employable population is engaged in this industry.

13.3.2 Social Infrastructure

Social infrastructure is relatively basic, with groundwater being used as a source of fresh water in the Kherson region, lack of municipal waste collection services and public roads in a state of disrepair. Each of the following villages has one health clinic and one school: Grigorievska, Pavlivska, Stroganivska, Ivanivska and Pershokonstantinivska⁸.

13.3.2.1 Human Health

According to WHO data⁹, life expectancy (at birth) for males and females in Ukraine (in 2012) was 66 years and 76 years, respectively.

The top five causes of death in the Ukraine in 2012 were:

- Heart disease (48%);
- Stroke (17.1%);
- HIV/AIDS (3%);
- Cirrhosis of the liver (2.5%); and
- Cancer of the lungs, bronchus and trachea (2.1%).

A number of health-related problems were identified in Ukraine:

- Fifth-highest prevalence of multidrug-resistant TB (MDR-TB) in the world
- TB presents a major public health challenge
- Low quality of primary care available to mothers and babies. Access to such services, especially for socially vulnerable groups and the rural population, is limited.
- Parents lack knowledge about childcare, nutrition and development as well as the related skills.
- The exclusive breastfeeding rate in Ukraine is only 18 percent, one of the lowest in the region¹⁰.
- Ukraine has been experiencing one of the fastest growing HIV epidemics in the world¹¹.

Health response to the humanitarian crisis in Ukraine

⁸ UA governmental sources

⁹ WHO (2015)

¹⁰ https://www.unicef.org/ukraine/activities_11382.html

¹¹ https://www.unicef.org/ukraine/activities_11384.html

The humanitarian crisis in Ukraine, due to the conflict in the east of the country, has affected 4.4 million people and led to the displacement of 1.6 million. Of those affected, 3.4 million are currently in need of humanitarian assistance. Access to primary, secondary and emergency health-care services and medicines has been disrupted on both sides of the contact line.

13.3.2.2 Language and Culture

According to national statistics, Ukrainian (official language) is spoken by 67.5% of the population and Russian (regional language) by 29.6%. Other languages include Crimean Tatar-, Moldavian-, and Hungarian-speaking minorities, which account for 2.9% of the population¹².

13.4 Key Potential Impacts and Mitigation

13.4.1 Population and Employment

The anticipated employment related impacts are as follows:

- Temporary jobs during the construction phase of the Project.
- Long-term, high quality jobs created for the life of Project.
- Indirect job creation from service and supply jobs (eg shops, hotels and restaurants) to meet demands from resident workforce.
- Potential to fail to meet community expectations for job creation due to a) lack of suitability of local candidates, especially during construction and b) during the transition from construction to operations.

A local hiring plan will be developed by the Project. ERE-AB estimate that between 80 and 100 local people (i.e., from neighbouring villages) will be employed during the construction phase of the Project.

Mitigation measures will be adopted to ensure local communities' expectations are managed with regard to the availability of jobs, to avoid disappointment.

Enhancement measures will also be adopted to expand the positive, long-term, impacts of Project employment such as utilising local suppliers for required materials equipment, investing in capacity building of local small businesses and working with local vocational training schools to develop curricula which will qualify local students to better meet the needs to the developing wind industry locally.

¹² <https://knoema.com/atlas/Ukraine/Regions-profiles>

The key impact on land use associated with the Project will be loss of land for use for livestock grazing / arable uses utilised by the local community. To minimise associated livelihood impact access to agricultural lands will be maintained as far as practicable during the construction phase for local communities use. During operation the Project site area, excluding land lost to the Project infrastructure, will be available for agricultural uses.

13.4.2 Economic Displacement

Economic displacement is identified as the main social impact in the ESIA study and in particular it is important to avoid reducing people's livelihoods as a result of the project. There is the potential for construction works to result in economic displacement if not properly managed. In terms of economic displacement, the project could have two key impacts: Direct loss of land from construction of tracks, hardstandings and foundations; and, construction works preventing free access to land. To address this, an additional land use survey and displacement assessment is being undertaken during the disclosure period. If this assessment work identifies significant economic displacement impacts then a Livelihood Restoration Plan will be developed and implemented to manage such impacts.

13.4.3 Construction Camps and Construction Workers

In the event that an accommodation camp is constructed for construction workers coming into the area, there is potential for conflict between local livestock farmers and construction workers. Minor adverse impacts are predicted. These effects are likely to be short to medium term during construction. Establishing clear rules for worker behaviour will avoid these issues. Further detailed assessment will be undertaken to determine the impacts of population influx and, if significant impacts are expected, an Influx Management Plan will be developed to set out measures to manage the influx of migrant labour during construction minimising impacts on local communities.

13.4.4 Social Infrastructure

13.4.4.1 Roads

The Project will involve the construction of new roads and the upgrade of existing roads in the area. The road construction activities, as well as the construction HGV traffic that will be required to transport the WTG materials to site, will be moderate adverse for the short time that that material and equipment are being transported. Overall, the impact on existing transportation infrastructure will be minor adverse to negligible, and of short duration.

13.4.4.2 Medical facilities

The negative impact of population influx creating pressure on existing social infrastructure will be most felt during the peak period of construction activities with the potential influx of employees and jobseekers. This would increase the risk of adding pressure to already stretched medical resources. It is anticipated that the continual presence of workers during the operational phase of the Project will have a negligible effect on the demand for medical care in the area.

13.4.4.3 Electricity Generation

The Project will add 250 MW generating capacity to Ukraine's existing renewable energy capacity.

13.4.4.4 Mitigation

The Project will, where required, invest in local, social infrastructure (e.g. hospitals, schools, roads) to mitigate potential impacts of increased pressure on existing social infrastructure and to meet the needs of the community in partnership with local government and in accordance with community demands as established from public consultation activities, without seeking to supplant or replace the role of the government in providing social services.

Water use and resource studies will be conducted to understand the water use requirements of the Project and the water resources available in the region, to ensure that the Project does not have a negative impact on the current water supply for local communities and agriculture in the area.

13.4.5 Human Health

13.4.5.1 Safety Risks from Traffic

The increase in HGV traffic due to the Project construction presents a risk of accidents that could result in anything from minor injury to serious injury or death. Injury or death from traffic impacts is a direct negative impact that will be localised and short term, occurring during the construction and decommissioning phases.

To mitigate the potential traffic related impacts from the Project, a Traffic Management Plan, comprising strategies to manage vehicles and equipment during the execution of the Project will be implemented. In addition, local communities will be provided with information via the SEP that they should not enter the construction area.

13.4.5.2 Increased Risks to Personal Safety from Population Influx

Increased risks to community safety and security are likely as a result of influx of workers and other individuals to the area. While worker camps are 'dry' and Camp Management Procedures will govern the behaviour of workers, potential risks to local communities may still exist from both workers and other migrants attracted to the area in search of income generating opportunities.

The following mitigation will be implemented:

- Appropriate training of security staff.
- Develop a code of conduct for security personnel and the general workforce.
- Introduce head of security personnel to neighbouring.
- Promote awareness of the Grievance Mechanism within local communities.
- If necessary a Population Influx Plan will be developed for the Project.

13.4.5.3 Injury or Death from Construction Activities and Unforeseen Events

Risks to community health from construction activities such as accidents, chemical releases are low provided the community or their livestock does not trespass within the construction area, particularly the WTG foundation excavations.

To mitigate the risk of severe injury and death from emergency events such as equipment/machinery accidents, the following mitigation measures will be implemented:

- Develop an emergency response plan (ERP).
- Liaise with local emergency responders.
- Communicate potential risks and ERP to local communities.

13.4.5.4 Respiratory Effects from Poor Air Quality

Construction activities will result in fugitive dust generated by vehicle traffic on unpaved roads, naturally occurring windblown dust from disturbed lands and dust generated during construction activities. This could result in respiratory impacts for the local community, ranging from minor irritation of the throat, eyes, nose to chronic irritation, asthma and other respiratory effects. To mitigate the potential air quality related impacts from Project activities, a Dust Management Plan (part of the overall ESMP) will be developed.

13.4.5.5 Spread of Food and Water-Borne Diseases

Population influx and increased Project waste and effluents may increase pressure on local waste management and sanitation services and infrastructure. This is within an area that is currently not serviced by municipal sewer systems or waste (refuse) collection services. To mitigate these impacts, the Project will promote healthy working and living conditions on the suite, develop and implement a Waste Management Plan and support public health campaigns.

13.4.5.6 Introduction and Spread of Communicable Diseases

The rapid increase in population associated with the construction phase of the Project increases the risk of introducing and spreading communicable diseases. To mitigate these potential impacts, the Project will conduct health screening of employees and contractors, provide awareness training to workers on communicable disease prevention and identify opportunities to support local public health campaigns.

To mitigate potential spread of disease from sewage effluent, the Project will develop and implement a detailed Waste Management Plan and the construction camp will have a local effluent collection and/or treatment system.

13.4.5.7 Increased Pressure on Health Services and Infrastructure

Project activities will result in an increase of non-resident population and workforce, which in turn could increase pressure on local health services and infrastructure. To mitigate the potential pressure on health services resulting from population influx, the Project will ensure that all Contractors are provided with adequate health care that is independent of the local health care system and liaise with local health professionals to identify ways that the Project can provide sustainable investments in the health care facilities used by their workers.

13.4.5.8 Increase in the Use of Alcohol

Population influx associated with the Project activities will increase the size of the workforce with disposable income in a generally impoverished area. This is likely to result in increased demand for alcohol in the area.

Alcohol use will be managed to some extent within the Project construction camps as they are designated “dry” areas. However, it is likely that during time off workers may leave the camp site to frequent local bars. This could also result in a potential increase in aggression or conflicts between workers and community members.

13.4.6 Occupational and Public Health and Safety

Occupational and public health and safety concerns associated with operation and construction of the Project will be similar to those from construction and operation of any industrial facility in a remote area. The major potential hazards include injury or death of humans or livestock caused by movement or operation of vehicles and equipment, accidents associated with the use of hand tools, falling objects and falls from height. Injury caused by blasting or contact with electrical lines or transformers are also potential impacts.

These potential impacts will be mitigated through adherence to international Health and Safety regulations and standards in addition to Ukrainian safety standards. A safety program will be developed to cover construction and then operation of the site. The program will describe in detail the potential hazards and the ways in which they will be prevented or avoided. All construction workers will be required to complete a training program that covers the safety program. Beyond the safety program, the Developer will compensate farmers for livestock that may be killed as a result of site-related traffic.

14 Impacts on Civilian Aviation

WTG blade tips may impact aircraft safety directly through potential collision or alteration of flight paths, or indirectly through impacting on aviation radar.

A consultation process is underway with civil / military aviation bodies to identify potential impacts and determine any required mitigation. Relevant mitigation will be included within the ESMP.

15 Environmental Management

This ESIA has summarised the EIA process undertaken to identify the impacts that will arise from the Project construction and operation and the mitigation measures required to prevent or reduce these. During the detailed design stage, further consultations and surveys will be undertaken to refine the design and construction techniques. One of the key mechanisms for environmental management during the design and construction stages is the Environmental and Social Management Plan (ESMP) and associated subject plans which will be developed by ERE- AB.

The most effective form of mitigation is to design the Project to avoid environmental impacts at source. Many environmental impacts have been avoided by sensitive layout and/or by commitment to the use of particular construction techniques and mitigation measures. In addition, construction and reinstatement techniques, that minimise environmental impacts, are well established.

The ESMP will ensure that the requirements detailed within this ESIA together with the Equator Principles, EBRD Performance Requirements and IFC Performance Standards are incorporated into the construction and operation of the Project.

15.1 Environmental and Social Action Plan

An important part of ongoing project management is the Environmental and Social Action Plan (ESAP). The ESAP is a separate document which lists a series of actions that the developer will undertake throughout the Project lifetime. This will include:

- Noise monitoring will be undertaken as part of EHS management measures
- Project design to take account of further studies still being carried out and in particular any issues that may be identified.
- EHS management plan will include independent bird observers (IOE) on site who will monitor bird flights across the site and who will be able to decide if action must be taken.
- Where large numbers of birds are recorded or where there is an important species of bird, the project is designed to shut down on demand to avoid bird collisions.
- As part of the developer's commitment to Corporate Social Responsibility (CSR) a list of CSR plans and activities will be prepared and will be discussed with local communities.

16 Corporate Social Responsibility

East Renewable Energy are committed to Corporate Social Responsibility and will develop a Community Investment / Community Benefit Package to ensure that the local community benefits as far as possible from hosting this Project in their community. The Community Benefits Package will be developed through ongoing consultation with the local community and stakeholders to ensure that the Package is tailored to local conditions and best meets the needs of local people. This consultation will begin in June 2018 and will continue to be developed through the lifetime of the Project. The Benefit Package will be implemented during the operational phase of the Project.

17 Contact Details

For any questions in relation to the project please contact:

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Further project information and the disclosure documents can be found at: www.nbtas.no