Cumulative Impact Assessment Report

460.8 MW Vifor Wind Farm, Buzau County, Romania

First Look Solutions S.A.

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1. INTRODUCTION

1.1 Background

Vifor Wind Farm (the Project) will be developed in Buzău County, Romania. The Project includes 72 wind turbine generators (WTGs) resulting in a total capacity of 460.8 megawatts (MW). All WTGs will be connected via underground cable lines to a single transformer station, and from there through a short overhead transmission line (OHL) to the national grid. The wind farm (WF) will be connected by a network of existing agricultural roads and newly constructed access roads. The main road artery will be the East-West construction corridor. Underground cable lines will be installed along the construction corridor.

ERM Environmental Resources Management SRL (ERM) was contracted by First Look Solutions S.A. (FLS, the Client, the Project Company), as independent environmental and social practitioners to undertake an Environmental and Social Impact Assessment (ESIA) for the Project. The Client is seeking to finance the Project based on international loans, and the ESIA Report has been produced specifically for the potential Lenders of the Project that may be providing funds/financial support.

This Cumulative Impact Assessment (CIA) Report is a part of the ESIA Report.

1.2 Project Description

The Project's 72 wind turbine generators (WTGs) are grouped into five sub-projects located in the Costești, Gherăseni, Smeeni, Luciu and Țintești communes of Buzău County (Figure 1-1).

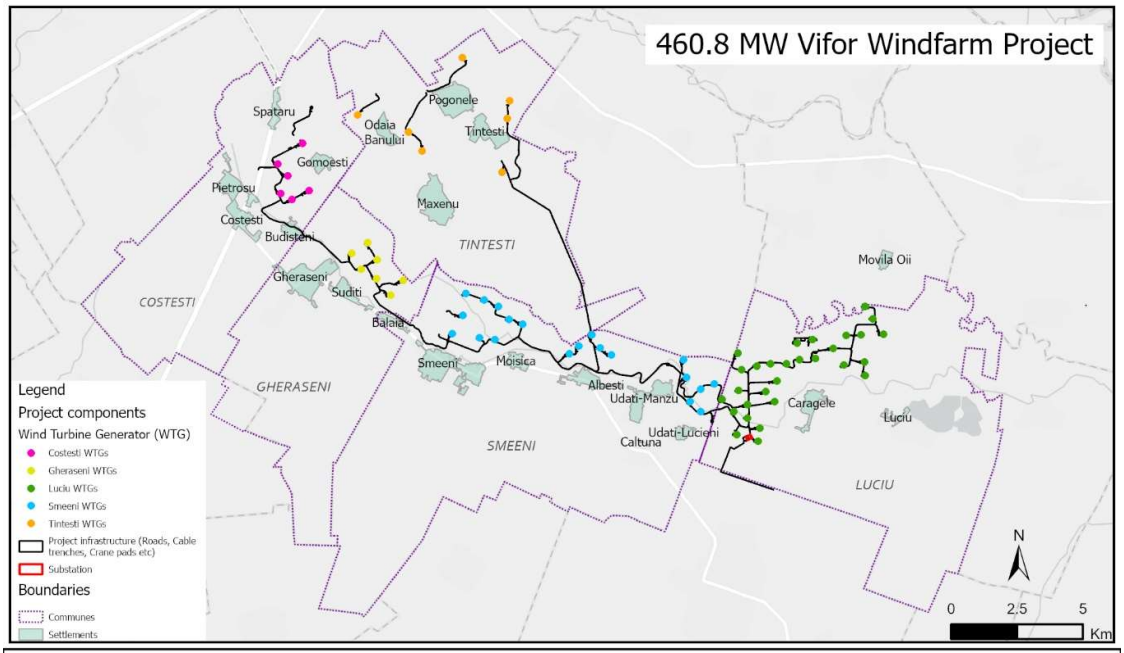

Figure 1-1 Project Location

The Project will be built on leased public land, owned by the Local Councils of the above-mentioned administrative areas. The land is currently being leased to local farmers who use and maintain the pasture, benefiting from agricultural subsidies provided by the state.

The area around the Project already has smaller renewable energy projects and other project that can contribute to the cumulative impact :

- Existing and operational projects:

- Pogoanele 8 MW wind farm, consisting of 4 WTGs that has been operated since 2014.
- Two Photovoltaic parks administrated by Engie, located in Stalpu settlement and installed capacity of 5 MW.

- Projects under construction:
  - A 2.25 MW photovoltaic power plant is currently being constructed in Costești.
  - A7 Moldova Motorway construction has been awarded favourable approval in February 2022 and expected to be completed in 2026. The motorway crosses the region of Stalpu, Ulmeni and Movila Banului settlements – West side of Vifor project.
- Planned projects:
  - Gherăseni Local Council is also working with a Romanian investor to develop a photovoltaic installation on a 6-ha arable land plot, via a concession contract.
  - A 39.2-ha land plot is planned for a future wind park between Țintești and Buzău. No information on the installed capacity is available. The wind park is currently in the design stage.
  - A 1.5 MW PV plant in the Țintești commune, on an area of 29,7 ha and installed capacity 1.5 MW.
  - A 165 MW wind farm on the land belonging to Stalpu (8 WTG), Ulmeni (7 WTG) and Movila Banului (10 WTG) settlements.

1.3 Purpose of this Document

This CIA Report presents the Cumulative Impact Assessment for the Project, designed to meet the International Finance Corporation's (IFC) Performance Standards and considers the cumulative effects or impacts that result from the combination of the Project and other existing or proposed developments in the area.

Cumulative effects/impacts [1] are often overlooked but can be highly significant for sensitive species and ecosystem services. The need for an assessment of cumulative effects must be considered throughout the ESIA process and generally include an analysis of clusters of projects, land use change trends, and/or foreseeable developments within, or near the Project Area of Influence (AoI).

The objectives of this CIA are to:

- Identify other existing and planned projects that could cumulatively impact the Project AoI;
- Identify the Valued Environmental and Social Components (VECs) that could be impacted cumulatively;
- Assess the cumulative impacts on VECs, considering the other projects; and
- Propose a Management Framework to avoid or minimise the cumulative impacts.

1.4 Relevant Standards and Guidelines

The IFC Performance Standards, 2012 are most relevant to this assessment.

[1] Cumulative impacts refer to successive, incremental and/or combined (aggregated) impacts from a project and the impacts from other past, existing and reasonably foreseeable future projects or activities that could affect the same biodiversity or natural resources, collectively affecting habitat, water quality or flow, or impacting the same locally endemic species. When project impacts make a significant contribution to cumulative impacts, and cumulative impacts are considered material, project impacts should be regarded as material and therefore significant too, and appropriate mitigation measures (starting with avoidance) should be applied (Ekstrom *et al.*, 2015).

Regarding CIA, IFC Performance Standard 1 (PS1): Assessment and Management of Environmental and Social Risks and Impacts [2] does not expressly require private sector clients to undertake a CIA. In paragraph 11 it states that the impact and risk identification process "*will take into account the findings and conclusions of related and applicable plans, studies, or assessments prepared by relevant government authorities or other parties that are directly related to the project and its area of influence*", including "*master economic development plans, country or regional plans, feasibility studies, alternatives analyses, and cumulative, regional, sectoral, or strategic environmental assessments where relevant*." Furthermore, footnote 17 states, "*the client can take these into account by focusing on the project's incremental contribution to selected impacts generally recognized as important on the basis of scientific concern or concerns from the Affected Communities within the area addressed by these larger scope regional studies or cumulative assessments*."

Performance Standard Guidance Note 1 (GN1), in paragraph GN38, states, "*in situations where multiple projects occur in, or are planned for, the same geographic area...it may also be appropriate for the client to conduct a CIA as part of the risks and impacts identification process*" and in paragraph GN41, it recommends that this assessment should (a) "*be commensurate with the incremental contribution, source, extent, and severity of the cumulative impacts anticipated,*" and (b) "*determine if the project is incrementally responsible for adversely affecting an ecosystem component or specific characteristic beyond an acceptable predetermined threshold (carrying capacity) by the relevant government entity, in consultation with other relevant stakeholders*."

1.5 Key Terminology

The following are definitions for key terms used in the CIA (IFC, 2013):

- **Cumulative Impact:** Impacts that result from the successive, incremental, and/or combined effects of an action, project, or activity added to other existing, planned, and/or reasonably anticipated actions, projects, or activities. For practical reasons, the identification, assessment, and management of cumulative impacts are limited to those effects generally recognized as important on the basis of scientific concern and/or concerns of affected communities.
- **Cumulative Impact Assessment (CIA)** is an instrument to consider cumulative impacts of the Project in combination with impacts from other relevant past, present, and reasonably foreseeable developments as well as unplanned but predictable activities enabled by the Project that may occur later or at a different location3.
- **Other projects:** Existing, planned, or reasonably expected future developments, projects and/or activities potentially affecting VECs.
- **External Stressors or Drivers:** Sources or conditions that could affect or cause physical, biological, or social stress on VECs, such as natural environmental and social drivers, human activities, and external stressors. These can include climate change, population influx, natural disasters, or deforestation, among others.
- **Valued Social and Environmental Components (VEC)** that are considered as important by the scientific community and/or potentially-affected communities. VECs may include:
  - Physical features, habitats, wildlife populations (e.g., biodiversity, water supply);
  - Ecosystem services (e.g., protection from natural hazards, provision of food);
  - Natural processes (e.g., water and nutrient cycles, microclimate);
  - Social conditions (e.g., community health, economic conditions); and

[2] International Finance Corporation (2012). Performance Standards on Environmental and Social Sustainability. Available at: https://www.ifc.org/wps/wcm/connect/Topics_Ext_Content/IFC_External_Corporate_Site/Sustainability-At-IFC/Policies-Standards/Performance-Standards

[3] World Bank (2018). Environmental and Social Framework (ESF). ESS1: Assessment of Management of Environmental and Social Risks and Impact. Annex 1, (d).

- Cultural heritage or cultural resources aspects (e.g., archaeological, historic, traditional sites).

VECs reflect the public and scientific community's "concern" or special interest about environmental, social, cultural, economic, or aesthetic values. VECs are considered the ultimate recipients of cumulative impacts because they tend to be at the ends of ecological pathways.

2. APPROACH AND METHODS

2.1 Approach

Unlike an ESIA, which focuses on a project as a generator of impacts on various environmental and social receptors, a CIA focuses on VECs as receptors of impacts from different projects and activities (Figure 1-1). In a CIA, the overall resulting condition of the VEC and its related viability are assessed.

ESIA: Project-Centered Perspective **CIA: VEC-Centered Perspective**

Source: IFC (2013)

Figure 2-1 Comparing ESIA and CIA (after IFC, 2013)

CIA is an evolving practice and there is no single accepted state of global practice (IFC, 2013). That being said, the IFC (2013 [4]) suggests that 'good practice' requires that, at a minimum, project sponsors assess whether their development may contribute to cumulative impacts on VECs and/ or may be at risk from cumulative effects on VECs they depend on during the ESIA process.

IFC's *Cumulative Impact Assessment and Management: Guidance for the Private Sector in Emerging Markets Good Practice Handbook* (IFC, 2013) outlines a six-step process (see Figure 2-2), which is iterative and flexible, with some steps having to be revisited in response to the results of others.

Based on the IFC guidance (2013), the approach to the CIA was undertaken in an iterative manner based on the 6-step process recommended in Figure 2-2, which included the following:

- Identify the spatial and temporal boundaries of the CIA, considering the combination of potential effects of multiple impacts on biodiversity from existing, proposed and anticipated projects;
- Identifying VECs in consultation with affected communities and key stakeholders where necessary;
- Evaluate the status and condition of the VECs (where possible, based on available data);
- Identify other developments and external natural and social stressors that may affect the VECs;
- Assess the combined impact of the Project and other developments and potential stressors, and the potential contribution of the Project to the cumulative impacts identified;
- Evaluate the potential significance of cumulative impacts on the VECs predicted future conditions;
- Based on the findings of the cumulative assessment, identify appropriate measures to manage cumulative effects/impacts, in addition to those recommended already for the Project and other developments.

[4] IFC (International Finance Corporation). 2013. Good Practice Handbook: Cumulative Impact Assessment and Management: Guidance for the Private Sector in Emerging Markets. Available online at: https://www.ifc.org/wps/wcm/connect/58fb524c-3f82-462b-918f 0ca1af135334/IFC_GoodPracticeHandbook_CumulativeImpactAssessment.pdf?MOD=AJPER S&CVID=kbnYgI5

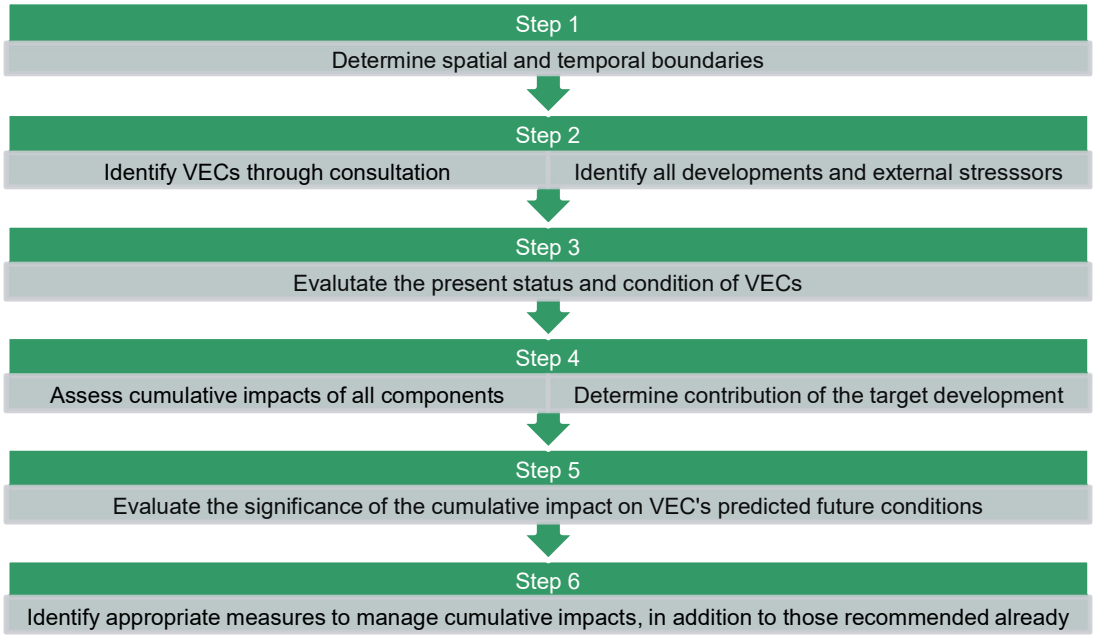

Figure 2-2 IFC's Six Step Approach to CIA

2.2 Information Sources

Information used to inform the CIA was sourced from the following:

- Environmental and Social Gap Analysis for Vifor Project (2021);
- Environmental and Social Scoping Report for Vifor Project (2023);
- Information and documentation provided by the Client during ESIA development;
- Publicly available information on the Project and environment;
- Technical Memorandum for the 1.5 MW PV Project in the Țintești commune (MEMORIU TEHNIC (primariabuzau.ro));
- Article on two photovoltaic parks in Stalpu settlement with total capacity of 5 MW (Engie cumpără încă două parcuri fotovoltaice în România - Tranzacție EXCLUSIV | PROFIT.ro).
- Public sources on other projects.

2.3 Assumptions & Limitations

The following limitations and caveats are to be considered:

- Incomplete information about other projects and activities (e.g., the information which may not yet be available in the public domain or where only short excerpts of survey findings are available with little information on bird collision risk assessment, for example);
- For the purpose of this CIA, it was assumed that condition of the VECs in the AoI is similar for the various wind farm projects given the close proximity of the various project sites to one another;
- Incomplete baseline information for selected VECs; and
- Uncertainty with respect to the implementation of future wind farm and transmission line projects in the region.

3. CUMULATIVE IMPACT ASSESSMENT

3.1 Boundaries of the CIA

Cumulative impacts are contextual and encompass a broad spectrum of impacts at different spatial and temporal scales (IFC, 2013). It is therefore important to establish upfront the spatial and temporal boundaries of the study.

3.1.1 Temporal boundaries

Temporal boundaries of the CIA included the following:

- past activities associated with historic practices by local communities and other land uses (e.g., agriculture) for example, based on historical imagery in Google Earth™ and literature dating back to the 2010 (approximately 10 years);
- the state of the environment and land uses based on the current status quo; and
- activities associated with other renewables and transmission line projects scheduled to commence with construction or become operational within the next 5 years (note that we have included projects that are currently operational, under construction, or in the active permitting process, based on the available information).

3.1.2 Spatial boundaries

Spatial boundaries of the CIA were defined as follows:

- The Project development area and AoI defined for the biodiversity baseline and impact assessment (including substations, access roads and final transmission line routes);
- The Project and neighbouring municipalities which encompass all other known operational and planned wind farms and photovoltaic (PV) plants in the local area;
- Protected Areas, Important Bird Areas (IBAs) and Key Biodiversity Areas (KBAs) within a 30 km radius of the Project area;
- Ecologically Appropriate Areas of Analyses (EAAAs) for volant and non-volant species identified for the Critical Habitat Assessment (ERM, 2023) to account for ecologically important/sensitive ecosystems, habitats and species that may be affected by the Project;
- Corridors of more intact, contiguous habitat for non-volant species;
- Known volant species movement corridors / flyways;
- Administrative boundaries of the municipality.

3.2 VEC Identification

Valued Social and Environmental Components (VECs) were identified through the ESIA process based on the outcomes of the baseline biodiversity and social assessment findings, as well as any stakeholder and expert consultations.

Importantly, the IFC (2013) states clearly "***VECs for which the project will have no direct or indirect impact do not need to be the subject of CIA***". Priority should rather be given to those VECs that are likely to be at the greatest risk from the development's contribution to cumulative impacts. In order to contextualize and inform the CIA and VEC identification and selection process, the key findings of the biodiversity and social baseline and impact assessments undertaken for the Project (ERM, 2022) was reviewed, and is presented in Table 3-1.

The following five (5) VECs have been included in the CIA given the potential minor to moderate Project-level impact significance/risk which could be significant when considered in aggregation with other wind farm and transmission line development impacts and existing land uses in the AoI:

- **VEC 1: Avifauna (birds and bats);**
- **VEC 2: Small mammals (subterranean);**
- **VEC 3: Employment;**
- **VEC 4: Traffic;**
- **VEC 5: Climate.**

The following aspects have been screened out of the CIA as the Project is not considered to be a significant risk or contributing factor to cumulative impacts:

- Other non-volant (ground dwelling) fauna;
- Flora;
- Natural habitat;
- Critical habitat;
- Aquatic ecosystems;
- Designated and protected areas;
- Ecosystem services;
- Water quality;
- Noise;
- Air quality;
- Landscape and visual;
- Socio-economic displacement;
- Archaeology and cultural heritage;
- Pasture land use and local livelihoods.

Table 3-1 VEC identification to inform the CIA

Aspect	Project Risk	Include as VEC?
	Environmental and Biodiversity	
Birds & bats	Typically, the largest operational risk of wind farms pertains to the potential collision of wind turbines with birds and bats and result collision-related injury and mortality effects. The baseline surveys undertaken for the Project suggest that there are several conservation important species at risk of collision with wind turbines and electrocution risk from planned transmission lines. This is reflected also in the biodiversity impact assessment in the ESIA. Multiple WF projects in the AoI may possibly have an appreciable influence on the local populations of threatened bird and bat species through both direct and indirect impacts. Unmitigated, the cumulative impact of multiple wind farm developments in the region could potentially result in negative population-level effects on birds and bats. Further analysis of the biodiversity impact assessment and collision risk modelling outputs for birds is therefore considered necessary to understand possible cumulative effects on birds and bats in the Project AoI.	**Yes**
Non-volant fauna (small mammals & reptiles)	In terms of non-volant fauna, two threatened mammal species and one reptile species were recorded in the Project area. Besides the species of conservation value, surveys also confirmed the presence of common species. Whilst the European Souslik (EN) and was found to not qualify the study area habitats as critical habitat, this species is still considered 'priority biodiversity' given its globally endangered threat status and presence within the Natura 2000 degraded steppe habitats in the Project area. Therefore, non-volant fauna (small mammals) were included as a VEC and further analysis of potential cumulative effects on subterranean small mammals was flagged for further analysis as part of the CIA.	**Yes**
Other non-volant fauna	The findings of baseline surveys and impact assessment indicate that other non-volant fauna are unlikely to be significantly affected directly or indirectly (e.g., through barrier to species movement) by the Project, given the nature of the landscape at the site and surroundings, and the fact that non-volant fauna of conservation importance are unlikely to depend on the modified and degraded habitats in the AoI and the risk of impact to populations of species will probably be insignificant at both local and regional scales. Common species of non-volant fauna are scoped out of the CIA and are not considered a VEC.	No, scoped out of CIA
Flora	No plant species of conservation concern were found to occur in the Project area, with all species listed as LC (Least Concern). No endemic plant species or species listed on the Red List of Plants in Romania were recorded. Flora was therefore scoped out of the CIA and not considered a VEC due to the rather insignificant nature of impact.	No, scoped out of CIA
Natural habitat	Most of the priority habitat (1530* Pannonic salt steppes and salt marshes) identified is in poor condition due to drought, continuous intensive grazing with unstainable stocking densities. Forests in the Project area occupy insignificant surfaces and are represented by plantations and wooded habitats that are mixed forests or slightly open woodlands. Modified/artificial habitats are largely represented by agricultural land under active cultivation for crops, and the cluster of settlements located south of Călmăţui river, and mostly south of the Project's components. The findings of the biodiversity impacts assessment for the Project determined that potential natural habitat loss, degradation (including introduction of invasive alien species) and fragmentation impacts can be mitigated such that residual impacts are unlikely to negligible. Natural habitat was therefore scoped out of the CIA and is not considered a VEC.	No, scoped out of CIA

Aspect	Project Risk	Include as VEC?
Critical Habitat	The Critical Habitat Assessment (CHA) compiled for the ESIA concluded that the study area and associated habitats do not qualify as critical habitat, as the IFC PS6 criteria and thresholds have not been met. The steppe (grassland) habitats in the study area are considered degraded and largely unsuitable for critical habitat qualifying species, with the CHA findings suggesting that these are unlikely to support a globally and regionally significant population of the three candidate species (European Souslik, Common Hamster and Saker Falcon), and therefore the study area does not qualify as critical habitat. *Refer to the CHA report contained in the ESIA for further information.* Critical habitat was therefore excluded as a VEC in this assessment.	No, scoped out of CIA
Aquatic ecosystems	There are no major perennial rivers or large wetlands on the development site or in nearby areas, that could be at risk of impact. Given the very limited risk of wind farm projects in general to aquatic ecosystems, and the limited risk and lack of important aquatic ecosystems in the AoI, aquatic ecosystems have been scoped out of the CIA and are not considered a VEC.	No, scoped out of CIA
Designated and protected areas	Infrastructure elements of the Project are planned to be partially located within ROSCI0259 Valea Călmățuiului Site of Community Importance and ROSPA0145 Valea Călmățuiului Special Protection Area (Natura 2000 protected areas) which will occur in direct habitat loss and degradation. According to the biodiversity impact assessment, 0.4% and 0.04% of the protected area habitats will be temporarily and permanently disturbed, respectively. The assessment predicts that with appropriate mitigation, significance will be minor (very small) for a post-restoration scenario of the temporarily affected habitats, which are in fact mainly modified agricultural land and/or degraded natural habitat. Given the limited impact of the Project that is unlikely to be a key contributor to cumulative loss of protected areas habitats and the modified/degraded nature of those habitats, protected area impacts are not considered a VEC for this assessment.	No, scoped out of CIA
Ecosystem services	Ecosystem services associated with the site are considered negligible, the majority of ecosystem services are not considered to be supplied at high levels and Demand for ecosystem services is typically low (see findings of the baseline ecosystem services assessment component of the ESIA). Overall, no priority ecosystem services (in terms of the IFC PS6 and EBRD PR6 definition) were identified for the Project area. Ecosystem services have been scoped out of the CIA and are not considered a VEC.	No, scoped out of CIA
Water quality	No planned discharges nor use of large volumes of hazardous materials during construction/operation and negligible risk of accidental release of pollutants. Sanitary wastewater generated on-site will be collected in sealed tanks and disposed of by authorized contractors. Also, there are no major or particularly important aquatic ecosystems such as large perennial rivers or significant wetlands nearby. Risks to drainage canals in mainly agricultural areas due to the OHL will also be low (see comments above under item 5 'Aquatic Ecosystems'.	No, scoped out of CIA
Climate	The renewable nature of the Project, in conjunction with other renewable energy projects in the AoI, is likely to contribute positively in terms of contributing to climate change mitigation by providing an alternative source of 'clean' energy and reducing dependence regionally on fossil fuels and related impacts.	**Yes**
	Cultural Heritage	
Archaeology and Cultural Heritage Resources	There is no mention of any linear or extensive archaeological sites that could be affected by more than one of the WFs (either alone or in combination with other known or reasonably foreseeable projects / activities), or any archaeologically significant	No, scoped out of CIA

Aspect	Project Risk	Include as VEC?
	sites where the setting would be compromised by the presence of multiple projects. Any impacts on archaeology and cultural heritage resources, if they do occur, are therefore considered to be local, with no identified cumulative effects.	
	Socio-economic	
Traffic	Given that the construction phase of smaller PV and wind farm projects in the AoI are likely to overlap, there is a risk cumulatively that pressure on the existing road transportation infrastructure will increase traffic impacts and risks appreciably, particularly if same regional access roads will be used by several projects to transport plant, equipment, workers and materials to sites.	**Yes**
Landscape & visual	Project is expected to have minor impact on landscape and visual.	No, scoped out of CIA
Employment	The Project, in conjunction with other projects that have been permitted in the AoI, will bring short-term and long-term employment opportunities to the region, mostly linked with the construction phase over a period of approximately 24 months per project. Long term operational opportunities are limited due to only a few staff being onsite for operational and maintenance phases. During decommissioning, crews of construction workers will be appointed.	**Yes**
Noise	Whilst the construction phase of the Project will generate noise, this will be short-term and is unlikely to be of great significance, pertaining mainly to increased traffic. Operationally, noise is unlikely to be an issue given the nature of the Project and distance from nearby villages.	No, scoped out of CIA
Air Quality	There will be no significant emissions to air during operation.	No, scoped out of CIA
Socio-economic displacement	The Project is unlikely to not result in physical relocation of any infrastructure or residences.	No, scoped out of CIA
Pasture land use and local livelihoods	The overall reduction in land available for pasture is not expected to have a major effect on the local livelihoods of farmers, due to the availability of significant areas of land in the wider area, relatively minimal proportion of land required by the projects, and the implementation of negotiated agreements and compensation strategies.	No, scoped out of CIA

3.3 VEC Status and Condition

CIA is built on an understanding of whether cumulative impacts will affect the sustainability or viability of a VEC as indicated by the predicted condition of the VEC (IFC, 2013). The significance of cumulative impacts is therefore contextualized in terms of 'thresholds or limits of acceptable change', beyond which further change in VEC condition would be considered unacceptable.

The viability or sustainability of VECs depends upon both the forces that affect them and their social and ecological resilience, which factors in receptor vulnerability/sensitivity (i.e., the degree to which they are susceptible to and unable to cope with disturbance, damage or injury).

Defining thresholds of acceptable change in VEC condition typically involves social and ecological scoping informed by scientific understanding, and can often be challenging to determine in light of limitations in available data. That being said, identifiable or known **trends of change in VEC condition** can be used as a proxy to indicate the level of concern for cumulative impacts. For example, if there is a recorded history of a long-term or steep decline in VEC condition, it may be inferred that an ecological threshold of concern is being approached, at which a VECs response to additional impacts may change abruptly (IFC, 2013).

3.3.1 VEC 1: Status of birds and bats

The approach of **identifying and documenting known trends in bird and bat species populations and key threats driving these trends** was undertaken for the CIA, by focusing on the key species VECs identified in Table 3-1. Several key threats to these species are documented in Table 3-2, all related in some way to human activities both past and present, either directly or indirectly. This was based on information contained in the IUCN Red Data List of Threatened Species online database [5], the findings of the baseline biodiversity assessment consisting of bird survey information (ERM, 2023), general documentation on the biodiversity of Romania and other information from projects and studies in the area of study/region.

Birds:

- A combined total of 99 species of birds were recorded during the baseline surveys. Of these species, several are migratory and species of conservation importance (i.e., threatened species), that include *Circus macrourus, Corvus frugilegus, Coturnix coturnix, Falco columbarius, Falco vespertinus, Numenius arquata, Philomachus pugnax, Streptopelia turtur* and *Vanellus vanellus.*
- A total of 31 species were confirmed as breeding in the study area. The baseline data reveals that most are wetland breeding birds or relatively common and/or widespread farmland birds whose nesting habits are likely to be linked to changing crop patterns and/or retained habitat features such as ditches, thickets and trees. Nest sites for species of LC, *Falco tinnunculus*, *Ciconia ciconia* and *Athene noctua,* were confirmed.
- No distinct migratory corridors were recorded in the Project area and the area is not a key wintering bird area.
- The preliminary Collision Risk Model (CRM) developed by ERM for the Project focused on 15 candidate target bird species, that included all raptors, waterfowl, waders and soaring birds:
  - Many species were excluded from the target species list based on low flight activity and low likelihood of collision within the lifetime of the WF;
  - Species of LC including *Pelecanus onocrotalus, Egretta garzetta* and *Circus cyaneus* attained the highest collision risk modelled (8.4%, 7.1% and 6.2% respectively);

[5] The IUCN Red List of Threatened Species: online database located at: https://www.iucnredlist.org

- Species with highest counts from VP surveys included common species of LC: *Anas platyrhynchos, Anser albifrons* and *Ciconia ciconia* which were among the species modelled in the CRM as having higher risk of collision at 4.6%, 5.4% and 6.3% respectively;
- In terms of threatened species, *Falco vespertinus, Vanellus vanellus* and *Numenius arquata* were the most notable based on abundance records at the site, with modelled collision risk of 4.1%, 4.2% and 4.7% respectively;
- In terms of estimated mortality (with avoidance), the common Mallard (*Anas platyrhynchos*, LC) which had the highest counts during surveys, is predicted to have the highest mortality at ~9.6 collisions per year with threatened species (*Numenius arquata, Falco vespertinus and Vanellus vanellus* and *Numenius arquata)* predicted to incur mortalities once every 34 years, 18 years and 3 years, respectively;
- In terms of mortalities for four species (White stork, Ruff, Collard pratincole, and Eurasian curlew) that are qualifying species for the Valea Călmățuiului Natura 2000 site (SPA), these species are estimated to incur less than 2 mortalities per year (modelled range: ~0.03 – 1.3 mortalities per year).
- Annual fatality thresholds for these species have not been determined.

Potential VEC bird species have been screened in Table 3-2 based on migratory status, conservation/threat status, key threats, habitat requirements/preferences and population trends, with species of conservation concern recorded in the Project area, with population trends that are generally decreasing (globally or in Europe) and birds at particular risk of collision and mortality in terms of the literature and known/observed bird behaviour in combination with the outcomes of the preliminary CRM in the context of wind farm development. Based on the VEC screening, none of the candidate species in Table 3-2 are considered priority VECs that could incur significant cumulative impacts as a result of the Project operation, from the perspective that these species are either:

- are not particularly susceptible to wind farm collisions;
- limited to very limited collision risk potential due to observed flight height and behaviour; or
- the CRM predicts that significant detrimental population level effects based on Potential Biological Removal (PBR) are unlikely over the lifetime of the WF.

This is further supported by the findings of the biodiversity impact assessment for the ESIA, which predicts that in terms of the operational phase (when the greatest impacts to avifauna are likely to occur), that the wind farm is likely to have a negligible effect on bird species through direct mortalities should appropriate mitigation be effective in reducing initial risks.

Table 3-2 Summary of VEC Birds Status and Species/Population Trends

Common / Species Name	IUCN Global RDL Status	Status	Range	Habitat (IUCN)	Key Threats (IUCN)	Population Level Trends & Risks (IUCN)	Vantage Point (VP) Survey & Collision Risk Model (CRM) Findings	Included as VEC bird species?
European Turtle-dove *Streptopelia turtur*	VU	Full Migrant	Large range over Europe, including Romania	The species uses a wide variety of woodland types, as well as steppe and semi-desert, frequently relying on agricultural land for feeding.	Transformation of agricultural land, including destruction of hedges and areas of scrub is thought to be an important factor in the decline of this species as well as the loss of semi-natural habitats. Changes in agricultural practices have several impacts on the species, as they can reduce both food supply and nesting habitat availability, and it is likely that the decline in food is the main limiting factor rather than decline in nest site availability. Hunting is also significant during migration and in its wintering range. A loss of suitable autumn stopping sites (field crops and trees around oases) may also have contributed to the population decline.	Decreasing. The European population is estimated at 3,150,000-5,940,000 pairs, which equates to 6,310,000-11,900,000 mature individuals. Europe forms 25-49% of the global range, so a very preliminary estimate of the global population size is 19,300,000-71,400,000 individuals. This roughly equates to 12,800,000-47,600,000 mature individuals.	VP survey did not identify birds flying at potential collision risk height Not included in CRM	No – not particularly susceptible to wind farm collisions, very limited collision risk potential due to flight height
Red-footed falcon *Falco vespertinus*	VU	Full Migrant	Large range over Europe, including Romania	Breeds in open lowlands with trees and plenty of insects and small vertebrates, on which it feeds, including steppe and forest-steppe, open woodland, cultivation and pastureland with tall hedgerows or fringing trees, agricultural areas with shelterbelts and, in the north-east, boggy areas and taiga edge.	The greatest threats are loss and degradation of foraging habitats and loss of nest sites. Intensification of agriculture has resulted in conversion of natural habitats to agricultural fields and a decrease in extensive grassland management, especially grazing, reducing the availability of suitable foraging habitats.	Decreasing. The European population, forming c.40% of the global population, is estimated to be 115,000-160,000 mature individuals. The global population is therefore suspected to be 287,500-400,000 mature individuals. The European population of 57,800-84,800 pairs (forming c.40% of the global population) suffered a large decline during 1970-1990 and continued to decline during 1990-2000, with overall	VP survey identified birds flying at potential collision risk height (18 flights in total) CRM: • Collision risk 4.1% • Annual mortality rate 0.06 (once every 18 years)	No– limited collision risk, despite decreasing population trend, species conservation status, unlikely to incur significant detrimental population level effect based on Potential Biological Removal (PBR) given low mortality

Common / Species Name	IUCN Global RDL Status	Status	Range	Habitat (IUCN)	Key Threats (IUCN)	Population Level Trends & Risks (IUCN)	Vantage Point (VP) Survey & Collision Risk Model (CRM) Findings	Included as VEC bird species?
						declines exceeding 30% in 10 years. The European population is now estimated to be decreasing at a rate of 35-40% in 12 years.		rate over the lifetime of the WF
Northern Lapwing *Vanellus vanellus*	NT	Full Migrant	Large range over Europe, including Romania	he species shows a preference for breeding on wet natural grasslands, meadows and hay meadows. It will also breed on grassy moors, swampy heaths, bogs and arable fields.	This species suffered past declines as a result of land-use intensification, wetland drainage and egg collecting. Important migratory stop-over habitats for this species on the Baltic Sea coastline are threatened by petroleum pollution, wetland drainage for irrigation, land abandonment and changing land management practices leading to scrub overgrowth.	Decreasing. The global population is estimated to number c. 5,600,000-10,500,000 individuals. The European population is estimated at 1,590,000-2,580,000 pairs, which equates to 3,190,000-5,170,000 mature individuals. The overall population trend is decreasing, although some populations have unknown trends. In Europe, trends since 1980 show that populations have undergone a moderate decline.	VP survey identified birds flying at potential collision risk height (16 flights in total) CRM: • Collision risk 4.2% • Annual mortality rate 0.3 (once every 3 years)	No – limited collision risk potential, unlikely to incur significant detrimental population level effect based on Potential Biological Removal (PBR) given low mortality rate over the lifetime of the WF
Eurasian Curlew *Numenius arquata*	NT	Full Migrant	Large range over Europe, including Romania	The species breeds on upland moors, peat bogs, swampy and dry heathlands, fens, open grassy or boggy areas in forests, damp grasslands, meadows. It also utilises wet grassland and arable fields during migration.	The species is threatened by the loss and fragmentation of moorland habitats as a result of afforestation and of marginal grassland habitats as a result of agricultural intensification and improvement. Expansion of renewable energy projects including wind farms can also have an impact although more studies are required.	Decreasing. The global population is estimated to number c.835,000-1,310,000 individuals. The European population is estimated at 212,000-292,000 pairs, which equates to 425,000-584,000 mature individuals and is roughly equivalent to 647,500-876,000 individuals. The European population is estimated to be decreasing by 30-49% in 31.2 years.	VP survey identified birds flying at potential collision risk height (2 flights in total) CRM: • Collision risk 4.7% • Annual mortality rate 0.03 (once every 34 years)	No – project area is not a key migration route, limited collision risk potential and unlikely to incur significant detrimental population level effect based on Potential Biological Removal (PBR) given low mortality rate over the lifetime of the WF
Rook *Corvus frugilegus*	LC, VU*	Full Migrant	Large range over Europe,	This species prefers agricultural land, wooded steppe and riverine plains with fragmented	Populations of this species have fluctuated since 1900. The main causes of fluctuations are changing	Decreasing. In Europe, the breeding population is estimated to number 8,170,000-14,200,000 pairs,	VP survey identified birds flying at potential collision risk height (4 flights in total)	No – not particularly susceptible to wind farm collisions,

Common / Species Name	IUCN Global RDL Status	Status	Range	Habitat (IUCN)	Key Threats (IUCN)	Population Level Trends & Risks (IUCN)	Vantage Point (VP) Survey & Collision Risk Model (CRM) Findings	Included as VEC bird species?
			including Romania	woodland or stands of trees. It is also found in the fringes of cities, towns and villages with large trees.	agricultural land-use (notably the loss of extensive pasture), the application of pesticides and seed dressings (mercury) and persecution through shooting.	which equates to 16,300,000-28,400,000 mature individuals. Europe forms c.30% of the global range, so a very preliminary estimate of the global population size is 54,300,000-94,700,000 mature individuals, although further validation of this estimate is needed.	Not included in CRM	limited collision risk potential due to flight height
Merlin *Falco columbarius*	LC, VU*	Full Migrant	Large range over Europe, including Romania	Broad range of habitats, including forest, shrubland, grassland, wetlands and artificial.	Population declines have also been attributed to loss of suitable habitat through overgrazing or conversion of native grassland into cultivated farmland, insensitive management, and increased tourism disturbing nest sites. The species also suffers collisions with man-made objects	Stable. The European population is estimated at 20,000-41,700 pairs, which equates to 40,100-83,400 mature individuals. Europe forms approximately 15% of the global range so a very preliminary estimate of the global population size is 267,000-556,000 mature individuals. In Europe, the breeding population size is decreasing by at least 30% over 13 year.	VP survey identified birds flying at potential collision risk height (2 flights in total) Not included in CRM	No – population trend stable, low collision risk
Common quail *Coturnix coturnix*	LC, NT*	Full Migrant	Large range over Europe, including Romania	It is found in open habitats including agricultural land.	Agricultural intensification has led to the loss of rough grass and uncultivated land and an increase in the use of herbicides and insecticides which have led to a reduction on the availability of weeds, seeds and insects. Other potential threats driving declines in Europe are hunting, long-term climactic fluctuations and drought.	Decreasing. This species is declining owing to netting of migrating birds. Local declines may be caused by changing agricultural practices, especially increased use of pesticides. The European population is estimated at 3,320,000-6,720,000 calling or lekking males, which equates to 6,630,000-13,400,000 mature individuals. Europe forms approximately 40% of the global range, so a very preliminary estimate of the global population size is 16,575,000-33,500,000	VP survey did not identify birds flying at potential collision risk height Not included in CRM	No – not particularly susceptible to wind farm collisions, very limited collision risk potential due to flight height

Common / Species Name	IUCN Global RDL Status	Status	Range	Habitat (IUCN)	Key Threats (IUCN)	Population Level Trends & Risks (IUCN)	Vantage Point (VP) Survey & Collision Risk Model (CRM) Findings	Included as VEC bird species?
						mature individuals, although further validation of this estimate is needed. The population is therefore placed in the band 15,000,000-35,000,000 mature individuals.		
Ruff *Philomachus pugnax*	LC, NT*	Full Migrant	Range overlaps with Romania	This species is fully migratory and travels on a broad front across Europe. It shows a preference for dry mounds and slopes with low willow Salix spp. and dwarf birch Betula spp. as lekking areas and dry patches of tall sedge as nesting sites.	The species is threatened by petroleum pollution, wetland and flood-plain drainage (for irrigation and water management), peat-extraction, and land abandonment and changing land management practices that lead to scrub and reed overgrowth.	Decreasing. The European population is estimated at 265,000-1,650,000 calling or lekking males, which equates to 531,000-3,310,000 mature individuals or 797,000-4,970,000 individuals. Europe forms approximately 50% of the global range so a very preliminary estimate of the global population size is 1,594,000-9,940,000 individuals. The global population was previously estimated to number 2,000,000-2,600,000 individuals. The overall population trend is decreasing, although some populations have unknown trends.	CRM: • Collision risk 3.6% • Annual mortality rate 0.57 (once every 1.6 years)	No – limited collision risk potential due to flight height, unlikely to incur significant detrimental population level effect based on Potential Biological Removal (PBR) given low mortality rate over the lifetime of the WF in comparison to number of birds observed and both the European and global population size which is large
Pallid Harrier *Circus macrourus*	NT	Full Migrant	Range overlaps with Romania	Breeds in semi-desert, steppe and forest-steppe up to 2,000 m, where its favoured nesting sites are wet grasslands close to small rivers and lakes, and marshland. Also found to breed in agricultural areas, at least when agriculture is non-intensive. Mosaics of forest/ shrubland and grassland and, to a	Primarily threatened by the destruction and degradation of steppe grasslands through conversion to arable land, burning of vegetation, intensive grazing of wet pastures and the clearance of shrubs and tall weeds.	Decreasing. The European population is estimated at 1,000-2,200 breeding pairs, which roughly equates to 2,000-4,400 mature individuals. Europe comprises about 40% of the species' global breeding range but holds a much smaller proportion of the global population. More recently, the European population trend was assessed as stable in the	VP survey identified birds flying at potential collision risk height (2 flights in total) Not included in CRM	No – not particularly susceptible to wind farm collisions, very limited collision risk potential due to flight height

Common / Species Name	IUCN Global RDL Status	Status	Range	Habitat (IUCN)	Key Threats (IUCN)	Population Level Trends & Risks (IUCN)	Vantage Point (VP) Survey & Collision Risk Model (CRM) Findings	Included as VEC bird species?
				lesser extent, agricultural land, are used in winter.		2021 European Red List of Birds (BirdLife International in prep.), partly due to an increasing breeding population in Northern Europe.		
Key to species threat status: VU = Vulnerable, NT = Near Threatened, LC = Least Concern * European Red List status								

Bats:

- As bats are typically long-lived and have exceptionally low reproductive rates, fatalities of significant bat numbers could affect local populations of recorded species.
- 15 species of bats were recorded during surveys. Bat species of Least Concern were specifically excluded from the CIA, which focused on potential impacts to populations for threatened species only.
- There was no obvious evidence of autumn migration, with no evidence of the use of the Project AoI as a migration flyway for bats.
- Two roosts of *Pipistrellus kuhlii* were confirmed during the summer survey - an abandoned church in Maxenu and an abandoned house in Pogoanele, while the autumn survey confirmed the maternity roost of *Eptesicus serotinus* in an abandoned house in Udati- Lucieni.
- A small number of migratory bat species of conservation concern (VU and NT at the global level) were recorded through bat surveys for the study area, including two insectivorous bat species: (*Barbastella barbastellus* – Western Barbastelle and *Nyctalus lasiopterus* – Giant Noctule) (see Table 3-2). These species show a preference for woodland and edge habitat, which is present in fragmented patches in the study area and AoI. These two species are considered to have decreasing global population trends, with key threats being largely due to habitat transformation and fragmentation.
- *Nyctalus lasiopterus* is considered to be at particularly high risk from wind turbine collisions and mortality (Table 3-3) based on information from EUROBATS concerning collision risk and flight height. This species of bat was therefore included as the primary bat species VEC. The other species of bat concerned have comparatively lower collision risk (Rodrigues *et al.,* 2014[6]) based on observed flight heights and with lower reported bat fatalities in Europe (EUROBATS).
- Fatality threshold targets cannot be determined for priority bat VECs due to a lack of information on the regional size and status of these populations.
- The findings of the biodiversity impact assessment for the ESIA, which predicts that in terms of the operational phase (when the greatest impacts to bats are likely to occur), that the wind farm is likely to have a potentially significant effect on bat species through direct mortalities should appropriate mitigation be ineffective in reducing initial risks and adaptive management be unsuccessful. Since local bat activity can change after WF construction, pre-construction studies have consistently proven to be poor predictors of the scale and magnitude of bat fatality impacts at species and population levels (Hein *et a*l., *2013*, Lintott *et al*., 2016). Given the constraints in determining bat fatality impacts prior to operation of the WF, it will be necessary to undertake further operational monitoring to validate cumulative operational impacts and to inform adaptive management if required.

[6] Rodrigues et al., 2014. EUROBATS Publication Series No 6: *Guidelines for consideration of bats in wind farm projects*.

Table 3-3 Summary of VEC Bat Status and Species/Population Trends

Common / Species Name	IUCN Global Threat Status	Status	Range	Habitat (IUCN)	Key Threats (IUCN)	Reported bat fatalities in Europe (2003 – 2016) according to EUROBATS [7]	Turbine Collision Risk (EUROBATS[8])	Flight Height (EUROBATS)	Population Level Trends & Risks (IUCN)	Recorded Behaviour at Project Site	Included as VEC bird species?
Western Barbastelle *Barbastella barbastellus*	NT (VU in EU*)	Full Migrant	Large range over Europe, including Romania	In summer, roosting sites occur in mature woodlands and occasionally in older buildings. This bat shows a high fidelity to roosting and foraging areas but not to single trees, which are changed frequently. Forages in mature woodland and woodland edges, feeding mostly on large moths.	Loss of old mature woodland and ancient trees with loose bark or wood crevices (reforested areas are not suitable for this species); disturbance and loss of underground habitats, disturbance and loss of roost sites in older buildings. Accidental mortality (roadkill) is also a problem.	Low (5)	Medium	>25 m	Decreasing. A rare or infrequent species. Population decreases are widely reported and it is considered threatened in many range states. Very small numbers in large part of the range with large temporary aggregations in areas without natural caves.	Low (34 contacts)	No – not at particular risk from wind farm impacts (medium collision risk rating according to EUROBATS, with few fatalities recorded in Europe)

[7] Rodrigues et al., 2014. EUROBATS Publication Series No 6: *Guidelines for consideration of bats in wind farm projects.*

[8] https://www.eurobats.org/sites/default/files/documents/publications/publication_series/pubseries_no3_english.pdf

Common / Species Name	IUCN Global Threat Status	Status	Range	Habitat (IUCN)	Key Threats (IUCN)	Reported bat fatalities in Europe (2003 – 2016) according to EUROBATS [7]	Turbine Collision Risk (EUROBATS[8])	Flight Height (EUROBATS)	Population Level Trends & Risks (IUCN)	Recorded Behaviour at Project Site	Included as VEC bird species?
Giant Noctule *Nyctalus lasiopterus*	VU (DD in EU*)	Full Migrant	Large range over central and eastern Europe, including Romania	Largely insectivorous, foraging over mixed and deciduous forest and wooded river valley. highly dependent on mature forest for colonies. Trees and rock crevices may also be used as hibernacula in winter.	Little is known about potential threats, but loss of mature woodland habitat and disturbance to roost sites as well as renewable energy projects are key threats.	Low (36)	High	>40 m	Decreasing. Although the global population trend is unknown, a decline is suspected in many regions, with mortality caused by wind farms that could noticeably reduce the population.	Moderate (115 contacts)	Yes –particular risk from wind farm impacts (high collision risk rating according to EUROBATS, but with relatively few fatalities recorded in Europe)

Key to species threat status:
VU = Vulnerable, NT = Near Threatened

3.3.2 VEC 2: Small Mammals (European Souslik)

During the baseline surveys, two threatened species of small mammal were recorded in the Project area, including European Souslik (*Spermophilus citellus*, EN) and Eurasian Otter (*Lutra lutra,* NT). One threatened reptile species (European Pond turtle *Emys orbicularis*, NT) was recorded. *L. lutra* and *E. orbicularis* are both freshwater/aquatic species and given that impacts of the Project on aquatic habitat are considered to be limited, it is unlikely that these species will be affected to a large extent.

In terms of the European Souslik (EN), whilst this candidate species was determined not to qualify the study area habitats as critical habitat, Souslik is still considered 'priority biodiversity' given its globally endangered threat status and presence within the Natura 2000 degraded steppe habitats in the Project area. The biodiversity impact assessment for the ESIA determined that the potential for direct loss of this species during construction is significant, and unmitigated, the wind farm development could potentially affect local Souslik populations negatively. However, with appropriate mitigation that aim to avoid entirely such direct impacts on Souslik populations, the post-mitigation impact is unlikely to be significant (negligible effect). Since baseline surveys revealed that the species was found to be confined mainly to canal embankments that are unlikely to be affected by construction (as the turbine infrastructure will be located away from these areas), this further substantiates the impact assessment findings.

3.3.3 VEC 3: Traffic

Transport infrastructure in the AoI includes local and regional roads.

The AOI includes all existing public roads connected to internal Project roads, including:

- E85 (also called National Road DN 2): one Project access point north of Costești;
- County Road (DJ) 203D: five Project access points including one west of Pogoanele and four Project access points north of Smeeni;
- DJ 203I,four Project access points, including three north of Caragele and one north of Pogoanele;
- Communal Road (DC) 37: two Project access points between Spătaru, and Gomoeşti;
- DC 33: one Project access point north of Odaia Banului;
- DC 176 (Str. Unirii): one Project access point northwest of Pogoanele;
- DC 241: two access points east of Gherăseni;
- DC 18: two access points east of Țintești;
- A local road - Str. Ing. Constantin Garofild one access point south of Ţintesţi. A portion of this road would become an internal Project road;
- A local road – Str. Berindeasca: two Project access points north of Pogoanele;
- A local road – Str. Călmăţui – within the town of Budişteni: one Project access point.

Based on the partial estimate of truck traffic (not including aggregates/sand and substation/cable components), Project construction could generate an average of 392 truck deliveries monthly (784 one-way trips) when all phases of construction are overlapping, or an average of 16 daily deliveries (32 one-way trips) assuming deliveries occurred 6 days per week. During peak periods, truck deliveries would be more frequent, although the extent of peak-period Project traffic has not yet been determined. While traffic volumes on E85 and DN 2C are unknown, the Project's daily trips are unlikely to represent a meaningful increase in existing volumes. More important, Project construction would likely result in a notable increase in the number and proportion of large trucks on those roads, as compared to current traffic. Project truck deliveries, and especially oversized truck transport, would

result in frequent, temporary periods of traffic slow-downs and backups during the 18 months construction period.

3.3.4 VEC 4: Employment

In 2021, the active population of Buzău County was approximately 134,000 people and included 82,000 people in employment. Over 25,000 people are engaged in agriculture, however with the lowest employment level. The highest employment was in manufacturing and trade, while the highest level of female employment was recorded in health and education.

The highest unemployment level in the Social AoI was noted in Luciu commune (12%), while Costești commune had the smallest rate registered. Overall, unemployment is higher for men than women. Main employment sectors include the public sector - administration, education and health and the private sector - mainly manufacturing, construction, commerce, transport and agriculture companies present in the local area. Many workers commute from the Social AoI to Buzău City. Additionally, pensioners represent a significant group in the community with many identified challenges.

3.3.5 VEC 5: Climate

Climate change at various scales (local to global) is likely to affect all aspects of biodiversity and human life on earth in one way or another and this depends on multiple interconnected factors. Climate change in the context of the site may affect the availability of water, wind probability and direction, altered fire regime, more extreme weather, etc. Modelled projections of future climate identify a likely increase in the frequency and severity of fire weather occurrence in this region, including an increase in temperature.

Climate change adaptation is considered a necessary aspect of project development globally for the future, and whilst projecting climate change in Romania can be considered complex, in general the frequency and intensity of extreme events (i.e., wild fires, extreme heat, floods and drought) will likely increase.

3.4 Potential Cumulative Impacts

Priority VECs identified for the CIA include avifauna (birds/bats) as well as socio-economic related VECs such as traffic. Therefore, other potential threats, land use activities and existing/future developments in the area that could present a cumulative risk/threat to the key bird/bat species in particular were selected for further investigation. These were identified both in terms of potential direct/indirect impacts to avifauna (injury/fatality) as well as habitat destruction that could affect nesting sites and reduce habitat supporting these key species.

3.4.1 General Regional and Local Level Threats and Risks

3.4.1.1 Habitat loss

Cumulative habitat loss is a major regional trend due to a range of legacy impacts associated with land uses such as human settlement, forestry, agriculture and infrastructure development. A general trend of extensive losses of viable steppe and forest habitat have already been documented for the 'Pannonian mixed forests' ecoregion, which was once covered by large tracts of oak-dominated forests, steppes, and lakes. The situation now is that the forests of the landscape have been almost completely used, transformed, or altered by human activities, being maintained for centuries by low-lying grazing and cultivation. Source of information: https://www.oneearth.org/ecoregions/pannonian-mixed-forests/

Cumulative natural (forest and steppe) habitat loss needs to be considered from the perspective of habitat loss for supporting key threatened bird species and European Souslik and potential impact to nesting sites and breeding colonies for example (as the priority VECs for the CIA). This indirectly

affects key threatened species through a reduction in available steppe and forest habitat and potentially impacting on nesting and breeding sites.

Whilst some species such as European Souslik have adapted to the change in land use (adapted to agricultural fields where displaced from their natural habitat), there are certainly other more specialized species that may not be able to adapt effectively.

3.4.1.2 Hunting pressures

Local hunting activity in the region may pose a potential threat to species considered pests as well as birds.

Key bird species (as the priority VECs for the CIA) are likely to be less vulnerable in terms of local and regional hunting pressures, in that they are unlikely to be directly targeted by poachers due to a lack of demand for these species for food or other purposes.

3.4.1.3 Human-wildlife conflict

Whilst human-wildlife conflicts are apparent threats to species, this is typically the case for large predators, animals considered dangerous to humans and nuisance-causing animals (pests).

Bird/bat species (as the priority VECs for the CIA) are less of a concern from a human-wildlife conflict perspective.

3.4.1.4 Traffic

Based on the partial estimate of truck traffic (not including aggregates/sand and substation/cable components), Project construction could generate an average of 392 truck deliveries monthly (784 one-way trips) when all phases of construction are overlapping, or an average of 16 daily deliveries (32 one-way trips) assuming deliveries occurred 6 days per week. During peak periods, truck deliveries would be more frequent, although the extent of peak-period Project traffic has not yet been determined. While traffic volumes on E85 and DN 2C are unknown, the Project's daily trips are unlikely to represent a meaningful increase in existing volumes. More important, Project construction would likely result in a notable increase in the number and proportion of large trucks on those roads, as compared to current traffic. Project truck deliveries, and especially oversized truck transport, would result in frequent, temporary periods of traffic slow-downs and backups during the 18 months construction period.

Higher traffic volumes will tend to result in increased risk of road incidents and crashes and more frequent incidents of travel congestion and delays, especially during peak traffic periods.

3.4.1.5 Socio-Economic

The need for construction workers can partially be met through a direct employment in the AoI and the wider area of Buzău County. It is assumed that the Project will employ daily around 500 to 600 people for the duration of construction phase currently estimated in 18 months. However, in case the Project timeline is accelerated at a later planning stage, there will be a need to engage additional workforce. Other smaller renewables projects in the AoI will also require workforce the amount of which is unknown but is unlikely higher than that of the Project.

The influx of workers and a potential increase in income of the local community will indirectly benefit the service and supply sectors where many local citizens will be able to find at least temporary jobs. Indirect and induced employment will particularly provide more opportunities to women, as opposed to direct employment in construction works, where more men are anticipated to be involved. What is more, the wages earned by construction and decommissioning workers can be spent in the vicinity of the Project's activities, therefore further feeding the local economy. The hotels and restaurant sector contributed 1/5 to the gross value in Buzău county in 2017, therefore the potential of the Project's

workforce use of such facilities and accelerated growth of this sector of local economy is expected to be significant for local small and medium enterprises (SMEs).

3.4.2 Natural Drivers

In addition to other human activities, IFC (2013) highlights the importance of identifying and characterizing natural ecological drivers and environmental processes that may exert an influence on VEC condition. From the perspective of potential cumulative impacts to the priority VECs, several natural ecosystem drivers and processes have been identified and described in terms of their potential influence on the trajectory of change for the priority VECs and overall relevance to the CIA, as per Table 3-4.

Of the drivers considered, none of these are expected to be materially exacerbated (cumulatively speaking) by the WF Project within the Project temporal boundary considered (relatively short-term), however it is acknowledged that these drivers could affect the Project in terms of potential damage to infrastructure and repair/maintenance costs in the future. Whilst awareness around how the Project design and implementation can reduce potential risk associated with extreme events related to natural drivers, particularly climate change (arguably human-induced), the complexity of natural processes and uncertainty of future events makes these aspects inherently difficult to internalise.

Table 3-4 Natural Drivers and Relevance to the CIA

Driver	Description	Association to VECs	Relevance to the CIA
1 Earthquakes	The earthquake risk for Buzau is classified as 'medium' according to the information that is currently available, which means that there is a 10% chance of potentially-damaging earthquake shaking in your project area in the next 50 years (https://thinkhazard.org/en/report/2456-romania-buzau/EQ).	Earthquakes can severely disrupt local transport networks, damage vehicles, destroy agricultural fields, affect water availability, affect electricity grid, potentially affecting traffic and, temporarily, employment.	Earthquakes, given their relative infrequency of occurrence, are unlikely to play a major factor in terms of the CIA given the temporal boundaries of the study. This has therefore not been considered further.
2 Soil erosion, slope stability and mass wasting	Soil erosion and mass wasting events (such as earth slips and landslides) are natural events. Landslide susceptibility is classified as medium. Meaning that that this area has rainfall patterns, terrain slope, geology, soil, land cover and (potentially) earthquakes that make localized landslides an infrequent hazard phenomenon (https://thinkhazard.org/en/report/2456-romania-buzau/LS).	Natural processes of erosion and mass wasting can be exacerbated by processes such as vegetation clearance. This is unlikely to have much relevance to the VECs considering also that erosion and mass wasting risks are likely to be minimal.	Given that the wind farm Project will not have a significant role in contributing to erosion risk, especially in the long-term during operation, the relevance of this driver to the CIA is considered limited and has not been considered further
3 Flood	For Buzau, river flood hazard is classified as low based on modelled flood, which means that there is a chance of more than 1% that potentially damaging and life-threatening river floods occur in the coming 10 years (https://thinkhazard.org/en/report/2456-romania-buzau/FL).	Floods can have a devastating effect on the identified VECs, including disruption of local transport networks, damage to vehicles, destroy agricultural fields, alter habitat for flora and fauna and affect water availability.	Given that the wind farm Project will not have a significant role in contributing to fire risk and water availability, this has not been considered further.
4 Drought	Water scarcity for the region is considered low, which means that there is up to a 1% chance droughts will occur in the coming 10 year (https://thinkhazard.org/en/report/2456-romania-buzau/DG).	The effect of droughts on the VECs could be pronounced as this will likely affect water availability for both species of fauna and flora and agricultural production in the region.	Given that the wind farm Project will not have a significant role in contributing to water availability or scarcity, this has not been considered further.
5 Fire regime	Buzau has a high risk level in terms of wildfires, meaning that there is greater than a 50% chance of encountering weather that could support a	Natural fires are likely to be few, however accidental wildfires caused by humans may be relevant. These could	Given that the wind farm Project will not have a significant role in contributing to fire risk,

Driver	Description	Association to VECs	Relevance to the CIA
	significant wildfire that is likely to result in both life and property loss in any given year (https://thinkhazard.org/en/report/2456-romania-buzau/WF)	affect nesting bird species, however most species are unlikely to be directly affected due to their high mobility.	this has not been considered further.
6 Climate change	Climate change at a global scale is likely to affect all aspects of biodiversity and human life on earth in one way or another and this depends on multiple interconnected factors. An altered climate will influence aspects that include altered fire regimes, increased and prolonged periods of drought and flood event magnitude, more extreme temperatures and weather conditions, altered soil moisture and various effects on animal and plant behaviour and conditions that are inherently difficult to predict. Climate change in the context of the site may affect the availability of water, wind probability and direction, altered fire regime, more extreme weather, etc. Modelled projections of future climate identify a likely increase in the frequency and severity of fire weather occurrence in this region, including an increase in temperature and greater variance in rainfall (https://thinkhazard.org/en/report/2456-romania-buzau/WF). Climate change is likely to alter slope and bedrock stability through changes in precipitation and/or temperature, however it difficult to determine future locations and timing of large rock avalanches, as these depend on local geological conditions and other non-climatic factors as well. Climate change adaptation is considered a necessary aspect of project development globally for the future, and whilst projecting climate change in Romania can be considered complex, in general the frequency and intensity of extreme events (i.e. floods and droughts) will likely increase.	Climate change impacts could compound any Project related and cumulative development impacts on VECs in numerous, complex ways, and enhance the magnitude, duration and severity of floods and droughts for example.	With little information available on this subject and much uncertainty affecting the confidence of predictions, the local level effects are unknown but could be significant in the long-term. This is however likely to be outside of the temporal boundaries set for the CIA and has therefore not been considered further in more detail.

3.4.3 Other Developments in the AoI

The renewable energy sector is already represented in the AoI, with several operational and planned wind farms and solar energy projects (at various stages in the permitting / authorisation process) in the AoI considered for the CIA. In addition, other major projects that can contribute to the cumulative impact are present in the area. These projects include:

- Existing and operational projects:
  - Pogoanele 8 MW wind farm, consisting of 4 WTGs that has been operated since 2014.
  - Two Photovoltaic parks administrated by Engie, located in Stalpu settlement and installed capacity of 5 MW.
- Projects under construction:
  - A 2.25 MW photovoltaic power plant is currently being constructed in Costești.
  - A7 Moldova Motorway construction.
- Planned projects:

- Gherăseni Local Council is also working with a Romanian investor to develop a photovoltaic installation on a 6-ha arable land plot, via a concession contract.

- A 39.2-ha land plot is planned for a future wind park between Țintești and Buzău. No information on the installed capacity is available. The wind park is currently in the design stage.

- A 1.5 MW PV plant in the Țintești commune, on an area of 29,7 ha and installed capacity 1.5 MW.

- A 165 MW wind farm on the land belonging to Stalpu (8 WTG), Ulmeni (7 WTG) and Movila Banului (10 WTG) settlements.

3.5 Significance of Cumulative Effects

In the context of a CIA, the incremental cumulative impact of a development under review is considered in terms of the following two scenarios:

- Scenario A: the anticipated future condition of the VECs when impacted only by the other developments in the future baseline.
- Scenario B: the anticipated future condition of the VECs taking into account both other developments and the Vifor WF Project, collectively.

The CIA for these scenarios was completed and is summarized in Table 3-5, providing an indication of cumulative impacts of other WF development projects, historic impacts and current land use trends (under scenario A) and the relative contribution of the Vifor WF Project (under scenario B).

Table 3-5 Cumulative Impact Assessment Summary

VECs	Scenario A: Cumulative Impact of other developments and land uses	Scenario B: Contribution of Vifor WF to Cumulative Impact
1 Birds & Bats	**Habitat loss and fragmentation effects:** Cumulative habitat loss is a major regional trend due to a range of legacy impacts associated with land uses such as human settlement, agriculture and infrastructure development. What is probably the most important is the existing pressures by agricultural activities and the consequent loss of large areas of steppe and forest habitat for supporting key species, which has arguably reached an unacceptable threshold. Given that the habitat within the region represents a mixture of degraded natural habitat and agricultural land (under active or recent cultivation), the effects of further habitat loss due to multiple renewable energy projects (existing and planned) for birds and bats may not be considered very significant, as there will still remain alternative habitat in the broader AoI. **Displacement and disturbance:** Of particular concern can be the combination of multiple wind farm projects potentially displacing birds and bats in the region and affecting their flight, hunting, mating and breeding behaviour. This may be particularly significant for certain target species such as migrants and threatened bird species for example. **Barrier effects to species movement:** Barrier effects of multiple wind farms operating in close proximity and in combination could be of concern, particularly for on migratory species, but there is limited existing information to indicate how significant this could be for the region. The cumulative effect of construction and operation of the proposed WFs could potentially, in the absence of mitigation, lead to an appreciable disturbance to flight paths habitually used by resident bats species, leading to potential displacement and changes in species behavior patterns at a local scale. This is likely to be exacerbated where placement of turbine infrastructure occurs within the areas of higher value to bat species, particularly key roosting, hunting and foraging sites (probably linked mainly to wooded habitat and edges). As bats are typically long-lived and have exceptionally low reproductive rates, fatalities of significant bat numbers could affect local populations of recorded species. A regional assessment of the effect of multiple wind projects on species migrations would be required to provide information to support further impact analyses.	**Impact contribution statement:** **Birds: T**he findings of the biodiversity impact assessment for the Vifor WF project ESIA predicts that in terms of the operational phase (when the greatest impacts to avifauna are likely to occur), that the wind farm is likely to have a relatively 'negligible' effect on bird species through direct mortalities by turbines/transmission lines should appropriate mitigation be effective in reducing key risks. Whilst threatened bird species may be affected negatively, but the CRM predicts that significant detrimental population level effects based on Potential Biological Removal (PBR) are unlikely over the lifetime of the WF. In light of these assessment outcomes, the WF project is therefore unlikely to contribute significantly towards cumulative impacts on populations of threatened bird species and other important birds from the perspective of the proximal Natura 2000 sites. **Bats:** The findings of the biodiversity impact assessment for the ESIA, which predicts that in terms of the operational phase (when the greatest impacts to bats are likely to occur), that the wind farm is likely to have a potentially significant effect on bat species through direct mortalities should appropriate mitigation be ineffective in reducing initial risks and adaptive management be unsuccessful. Only Giant Noctule (NT globally) was identified as a VEC in terms of bat species and is considered to be at risk from wind turbine collision and mortality. This species may possibly utilize grassland/steppe habitat and where necessary the agricultural fields on the site for foraging, but in general, available literature on this species and others indicates they are more active and present foraging within dense wooded habitats (e.g. deciduous woodland, riverine forests and orchards) and associated clearings of forest/woodland, rather than open steppe and agricultural fields. There is no evidence of the use of the site as a migratory flyway for bats, such that mortalities due to collision are expected to be relatively few and therefore probably of limited significance for local bat populations. The contribution of the Vifor WF to cumulative risks on bat species populations is expected to be relatively minor.

VECs	Scenario A: Cumulative Impact of other developments and land uses	Scenario B: Contribution of Vifor WF to Cumulative Impact
	Collisions with turbines resulting in mortality: Existing and planned wind farms will likely increase the statistical chance of collisions as the network of turbines and grid connections grows in the region. The presence of several species such as raptors, waterfowl, large-bodied birds and bats known to be collision risk species in the region, including several threatened species, raises the concern that the potential cumulative effect of direct mortality could be considered a potentially significance impact. **Electrocution from transmission lines resulting in mortality:** Whilst it is difficult to quantify this impact (with limited published information), available information suggests that residual bird interaction impacts with power lines can probably be effectively mitigated such that this is potentially of limited significance, but this is purely speculative at this stage as poorly planned electricity transmission infrastructure can have potentially disastrous effects on avifauna such as birds in particular. Bat species in the region are typically small bodied and less likely to be of electrocution risk.	**Selected project ESIA information for informing the impact statement:** **Birds:** ■ No distinct migratory corridors were recorded in the Project area and the area is not considered a key wintering bird area based on the baseline survey findings for the ESIA. ■ Key bird species at risk of collision impact with the wind farm were screened (see Table 3-2). ■ Based on the VEC screening, none of the candidate species in Table 3-2 are considered priority VECs that could incur significant cumulative impacts as a result of the WF operation, from the perspective that the majority of these species are not particularly susceptible to wind farm collisions, there is limited to very limited collision risk potential due to observed flight height and behaviour and.or the CRM predicts that significant detrimental population level effects based on Potential Biological Removal (PBR) are unlikely over the lifetime of the WF. **Bats:** ■ As bats are typically long-lived and have exceptionally low reproductive rates, fatalities of significant bat numbers could affect local populations of recorded species. ■ From the baseline surveys for the ESIA, there was no obvious evidence of autumn migration, with no evidence of the use of the Project AoI as a migration flyway for bats. ■ Giant noctule, *Nyctalus lasiopterus* (globally VU), is considered to be at particularly high risk from wind turbine collisions and mortality (Table 3-3) based on information from EUROBATS concerning collision risk and flight height. This species of bat was therefore included as the primary bat species VEC. The other species of bat concerned have comparatively lower collision risk (Rodrigues *et al.,* 2014[9]) based on observed flight heights and with lower reported bat fatalities in Europe (EUROBATS).

[9] Rodrigues et al., 2014. EUROBATS Publication Series No 6: *Guidelines for consideration of bats in wind farm projects.*

VECs	Scenario A: Cumulative Impact of other developments and land uses	Scenario B: Contribution of Vifor WF to Cumulative Impact
2 Small Mammals (European Souslik)	A general trend of extensive cumulative losses of viable natural steppe habitat have already been documented for the 'Pannonian mixed forests' ecoregion, which was once covered by large tracts of oak-dominated forests, steppes, and lakes, due to a range of legacy impacts associated with land uses such as human settlement, agriculture and infrastructure development. Since the habitat within the region represents a mixture of degraded natural habitat and agricultural land (under active or recent cultivation), the effects of further habitat loss for European Souslik are not considered significant, as there will still remain abundant alternative habitat in the broader AoI. Additional habitat loss or fragmentation will be both temporary during the construction and decommissioning phases and permanent during the operational phase of multiple windfarms. The scale of total habitat loss is quite unlikely to be significant.	**Impact contribution statement:** Field surveys in the study area indicate that *S. citellus* is confined mainly to canal embankments that are unlikely to be affected by construction (as the turbine infrastructure will be located away from these areas). As such, the contribution of the Vifor WF project to declines in regional Souslik populations is likely to be negligible at most. **Selected project ESIA information for informing the impact statement:** ■ Despite not qualify the site as critical habits, European Souslik (EN) is still considered 'priority biodiversity' given its globally endangered threat status and presence within the Natura 2000 degraded steppe habitats in the Project area. ■ The biodiversity impact assessment for the ESIA determined that the potential for direct loss of this species during construction is significant, and unmitigated, the wind farm development could potentially affect local Souslik populations negatively. However, with appropriate mitigation that aim to avoid entirely such direct impacts on Souslik populations, the post-mitigation impact is unlikely to be significant (negligible effect).
3 Traffic	**Impact statement (other WFs and PV plants):** A smaller windfarm and a PV project could be under construction simultaneously with Vifor WF. These will require truck deliveries of equipment, supplies, and materials. If multiple projects use same roads to transport materials to the respective project sites, traffic will experience increased congestion, delay, travel risks and road surface wear and deterioration. Due to the small volume of traffic generated by windfarm operations, and the uncertainty of the timing and likelihood of windfarm decommissioning, only the construction phase is considered for cumulative impacts. **Selected data informing the impact statement:** ■ Based on the current known status and schedules, 1 smaller windfarm and 1 PV plant could be in the construction phase at the same time as Vifor WF.	**Impact statement (with Vifor WF):** With the mitigations recommended in the ESIA, Vifor WF construction is anticipated to have minor negative impacts on road congestion, safety and condition. The contribution of Vifor WF to cumulative impacts on road traffic is also considered to be minor. **Selected data informing the impact statement:** ■ Recommended traffic management measures would reduce the impact of the added truck traffic and oversized loads on other road users by scheduling truck deliveries during non-peak hours, coordinating with local police and stakeholders in scheduling, and providing public information on planned scheduling.

VECs	Scenario A: Cumulative Impact of other developments and land uses	Scenario B: Contribution of Vifor WF to Cumulative Impact
	■ Cumulative effects on transportation would arise if projects under construction during the same time period also use the same road for truck transport and worker commuting. Each windfarm would use local and agricultural roads within and adjacent to its particular project area. For purposes of this analysis, only shared use of regional roads would result in cumulative impacts.	■ Recommended safety measures include ensuring driver training and monitoring, good vehicle maintenance, and proper loading. ■ Vifor WF will have an incremental contribution to the cumulative impact on road congestion, safety and condition. Traffic management plans must include coordination between WF construction projects to manage deliveries, avoid severe congestion or delays, promote worker ridesharing, ensure uniform implementation of vehicle and driver safety measures, and coordinate with road authorities on road maintenance and repairs.
4 Employment	**Impact statement (other WFs):** In respect to cumulative socio-economic effects to the area, no adverse effects are identified. The most significant cumulative effects are beneficial and are related to increase of community revenues and, to a certain extent, increase of employment. The beneficial cumulative effect on municipal revenues and social investment programmes is likely to be significant. The construction of windfarms is expected to create both direct and indirect employment opportunities. **Selected data informing the impact statement:** ■ Development projects are likely to stimulate the local economy and provide both temporary and permanent jobs. ■ Municipal budgets are likely be increased as a results of agreements between the windfarm operators and local municipalities (e.g., profit sharing agreements or similar) and social investment programmes. ■ Each windfarm project will also result in some development of the local area, in particular in terms of improving access between local communities..	**Impact statement (with Vifor WF):** The Project will encourage the Contractors to recruit the construction and operation workers from the nearby communities whenever possible and appropriate. The addition of the Vifor Windfarm to the other renewables projects planned will enhance the positive impacts on local employment and incomes, given the increased demand on specialised local manpower. **Selected data informing the impact statement**: ■ The Project is expected to generate positive impacts on local economic and employment conditions at the regional level throughout its life cycle. Primary impacts are expected to take place during the construction phase through the creation of temporary employment opportunities. ■ Opportunities for economic development and diversification may also result from the use of local goods and services during the construction phase, in particular through sourcing of significant quantities of construction materials and expenditures associated with the running costs of vehicles (i.e., fuel, lubricants, and additives).
5 Climate	Wind energy projects do typically have positive effects as well. One such effect is the potential to create more sustainable, renewable and clean energy and shift away from traditional approaches to energy production involving fossil fuels that are unsustainable, non-renewable and polluting. Cumulatively speaking, together with the numerous renewable energy solar	Whilst considered minor, the contribution of the Vifor WF towards sustainable development and reduced dependency on non-renewables through clean-energy production and therefore a positive impact to climate change mitigation will probably be minor and at the local scale.

VECs	Scenario A: Cumulative Impact of other developments and land uses	Scenario B: Contribution of Vifor WF to Cumulative Impact
	and wind) projects operating or planned in the region, wind farm energy projects can be seen as having a positive biodiversity impact through their role in moving towards a low carbon economy, and reducing the effects global climate change may have on the region[10]. Replacing traditional approaches in the energy sector with less impactful solutions such as wind energy is documented to have a net positive impact on both global climate and biodiversity. The potential averted biodiversity loss that could be anticipated to occur in the Project area or further afield from typical fossil-fuel extraction, processing and power-generation projects could be significant. However, this would typically need to be evaluated at national and global scales (possibly regional), which is beyond the scope of what this assessment can achieve. Such benefits are also inherently difficult to predict and quantify.	

[10] WWF, 2018. Wildlife in a Warming World: The effects of climate change on biodiversity in WWF's Priority Places. Available online at: https://www.wwf.org.uk/sites/default/files/2018-03/WWF_Wildlife_in_a_Warming_World.pdf

3.6 Recommend Appropriate Mitigation

The estimate of the cumulative project impact, together with ESIA results, is used to inform the need for further project-specific mitigation. Overall, the Vifor WF project is unlikely to be a major contributor to cumulative impacts to the VECs identified, both in terms of biodiversity (avifauna) and socio-economically. It is therefore considered appropriate that the Project level mitigation measures recommended in the ESIA should adequately reduce residual impact significance to insignificant or minor levels and should therefore be considered adequate from the perspective of mitigating cumulative impacts. These are summarised in Table 3-6.

As part of the Cumulative Impact Mitigation Strategy (Table 3-6), several broad mitigation measures are recommended by ERM for other development projects, in order to potentially reduce and management cumulative risks to the VECs assessed. These measures can assist in future with informing the mitigation strategies for similar planned development in the region that may pose a risk of cumulatively affecting the VECs identified.

Table 3-6 Cumulative Impact Mitigation Strategy

VEC	**Summary of Vifor WF Project Measures that Mitigate Impacts to VECs** (from ESIA impact assessment)	**Possible Mitigation for Other Projects to address Cumulative Impacts**
1: Birds & bats	■ Implement buffer zones or exclusion areas around important nesting or foraging sites to minimize disturbance. ■ Where possible avoid site clearance during the breeding season. Where not, use Ecological Clerks of Works to identify nests and avoid till young have fledged. ■ Implement construction practices that minimize noise and vibration disturbance, such as scheduling activities outside sensitive bird breeding periods or using noise barriers. ■ Where possible avoid site clearance during the breeding season. Where not, use “Ecological Clerk of Works” (ECoW) which will prepare the environmental documentation on delivery of ecological requirements on site before construction activities commence in order for contractors to meet key development milestones. ■ The ECoW will monitor that site-based construction activities are delivered in accordance to relevant laws and Project commitments. ■ Fence and mark work areas to minimise effects of vegetation clearance on birds. ■ Conduct thorough surveys to identify and protect nesting sites before construction begins. Implement buffer zones around active nests and restrict construction activities within these areas during breeding season. ■ Fit suitable bird diverters at 5m intervals. ■ Install insulation, covers, and other avian protection devices on electrical equipment to prevent perching and contact. Regularly inspect and maintain the electrical infrastructure to ensure its effectiveness in mitigating electrocution risks.	■ Where raptor nests are identified by construction teams, a policy of ceasing works should be enforced until the bird species has been confirmed by a biodiversity specialist and a strategy to avoid nest impact has been agreed to. ■ For future wind or solar energy projects currently in the planning phase, project planning and design should consider alignment with existing power lines and roads to avoid further linear impacts and concentrate risks at a point rather than dispersing risks over larger areas, making risks more practical and easier to manage. ■ Supporting local and regional endeavours to restore landscape connectivity where possible, through innovative approaches to reforestation and wildlife corridor creation, for example. ■ Mechanisms to encourage the sharing of long-term vegetation, habitat and species monitoring data (from baseline surveys through to operational monitoring) can be useful in furthering the understanding of regional trends in habitat degradation and the relative impact on bird species. Without this long-term data and trends analysis, conservation actions (even collaborative efforts) will be difficult to implement since these typically cannot be actioned easily over very broad areas. ■ Coordinating and harmonizing monitoring and mitigation measures across WF projects so that cumulative effects on bird and bat populations can be accurately measured, assessed and adaptively managed.

VEC	**Summary of Vifor WF Project Measures that Mitigate Impacts to VECs** (from ESIA impact assessment)	**Possible Mitigation for Other Projects to address Cumulative Impacts**
	■ Pre-construction checks for presence of bat roosts near construction sites. ■ Establishing buffer zones around bat roosts. ■ Adjusting construction schedules to avoid sensitive periods. ■ Implement proper lighting protocols to minimize disturbance. ■ Implement noise reduction measures to minimize noise-related disturbance near bat roosts. ■ Control of lighting to prevent light spill outside of construction areas through use of directional cowls. ■ Implement post construction fatality monitoring to quantify collision rates. ■ Develop adaptive management plan including shut down on demand systems based on casualty thresholds. ■ Implement ongoing monitoring programs to assess the effectiveness of mitigation measures and make necessary adjustments. ■ Implement appropriate lighting systems that reduce the attraction of birds to turbines during low-light conditions. Utilize lighting designs that minimize disorientation and provide adequate illumination for safe bird passage. ■ Monitor effects of displacement of breeding qualifying bird species through repeat transect surveys years 1-3, 5, 10 & 15. ■ Implement insulated covers on power lines to reduce the risk of electrocution. ■ Conduct regular inspections and maintenance to identify and address any potential hazard.	■ Proper management of existing Natura 2000 habitats on the windfarm sites would be important and it would be only effective in liaison between the windfarm developers and the relevant Environmental Department. ■ The creation of new woodland and scrub in undeveloped areas between the windfarm sites would provide suitable foraging habitats for bat species. In addition, careful management of the existing habitats on each site would allow bat species that are currently present to remain on site after initial disturbance effects. ■ Ultimately, development and land utilization projects need to ensure that they align with the goals and objectives of the Natura 2000 protected areas, relevant sustainable development strategy and policies and the relevant national biodiversity strategy of the Romanian Government.
2 Small Mammals (i.e. European Souslik)	■ Conduct pre-construction surveys where *Spermophilus citellus* habitats were identified within 100m of turbines during the baseline studies. ■ Establish temporary exclusion zones around sensitive *Spermophiluis citellus* habitats to prevent destruction of burrows. Create buffer areas around key habitat zones to reduce noise levels, limit human activity. ■ If road widening is required then this should be on the opposite side to the river embankments. ■ Implement strict construction protocols to minimize disturbance to the species, including complying to specified working hours to minimize noise, implementing dust control measures to maintain air quality and utilize appropriate barriers to prevent unintentional access to construction areas. ■ Implement a robust monitoring program during the construction phase to assess the impact on *Spermophilus citellus* and their habitat. This includes regular surveys, population monitoring and tracking of	■ Supporting local and regional endeavours to restore landscape connectivity where possible, through innovative approaches to wildlife corridor creation, for example. ■ Mechanisms to encourage the sharing of long-term vegetation, habitat and species monitoring data (from baseline surveys through to operational monitoring) can be useful in furthering the understanding of regional trends in habitat degradation and the relative impact on European Souslik. Without this long-term data and trends analysis, conservation actions (even collaborative efforts) will be difficult to implement since these typically cannot be actioned easily over very broad areas. ■ Coordinating and harmonizing monitoring and mitigation measures across other renewable energy (solar and wind) projects so that cumulative effects on species populations can be accurately measured, assessed and adaptively managed.

VEC	**Summary of Vifor WF Project Measures that Mitigate Impacts to VECs** (from ESIA impact assessment)	**Possible Mitigation for Other Projects to address Cumulative Impacts**
	individuals. If unexpected impacts are observed, use adaptive management strategies to modify construction practices and mitigate any negative effects on the population. ■ Where precautionary working methods cannot prevent disturbance or destruction of animals or burrows undertake licenced translocation programme involving suitably qualified and experience experts. ■ Establish exclusion zones or limiting construction activities in close proximity to active burrows. ■ Use noise barriers and mufflers on construction equipment. ■ Schedule noisy activities during periods of low activity or avoid sensitive breeding season. ■ Implement crossings strategy ahead of construction to provide suitable crossing points over or under infrastructure. ■ Implement a habitat restoration or enhancement plan to provide alternative habitat or improve existing habitat for the species. ■ Monitor populations post construction, set thresholds for adaptive management. ■ Include habitat creation and enhancement options within adaptive management plan.	■ Set aside reasonable portions of sites for the preservation of suitable habitat supporting European Souslik. Careful management of the existing habitats on each project site would allow species that are currently present to remain on site after initial disturbance effects. ■ Proper management of existing habitats on the windfarm sites would be important and it would be only effective in liaison between project developers and the Environmental Department. The creation of new steppic habitats in undeveloped areas between the Project sires could provide suitable foraging habitats for Souslik. ■ Ultimately, development and land utilization projects need to ensure that they align with the goals and objectives of the Natura 2000 protected areas, relevant sustainable development strategy and policies and the relevant national biodiversity strategy of the Romanian Government.
3 Traffic	■ Establish a transportation management plan that addresses the other mitigations, provides a detailed plan for Project deliveries, and incorporates the results of stakeholder and community engagement. ■ Schedule truck deliveries during non-peak traffic periods. ■ Work with local police and other stakeholders in scheduling truck deliveries, especially oversized truck deliveries. ■ Schedule deliveries to minimize travel impacts for other road users based upon local conditions and the results of stakeholder engagement. ■ Consider movement of oversized or escorted loads at night, if feasible and safe, to ensure minimal impact to traffic flow. ■ As part of a Project-related public engagement programme, regularly inform, educate, and update stakeholders and communities close to transport routes about Project construction traffic, especially about the safety issues and scheduling associated with movement of heavy and oversized loads on public roads. ■ Obtain necessary permits and implement all necessary road improvements or alterations prior to use of the routes for oversized Project shipments. ■ Restore signs, street lights and other street furniture removed for or damaged by the movement of Project-related trucks during construction.	■ Plan and implement transportation management measures in cooperation with local authorities and other windfarm developers. ■ Plan truck transport to avoid peak commuting hours ■ Establish frequent (i.e., monthly or other appropriate interval), regularly scheduled meetings between windfarm developers and local traffic management authorities to address any problems that arise during the construction period and ensure measures to minimize disruption for road users and provide for road safety are consistently implemented.

VEC	**Summary of Vifor WF Project Measures that Mitigate Impacts to VECs** (from ESIA impact assessment)	**Possible Mitigation for Other Projects to address Cumulative Impacts**
	■ Upon completion of the construction phase, repair and restore all agricultural roads within the Project area to correct wear and deterioration. Remove road surfaces and signage related only to construction, as established in the plans approved by the local road authorities for improvement of the agricultural roads prior to Project construction. ■ As part of the Transportation Management Plan, address transportation safety risks of Project construction traffic. Address hours of transport, community notification, signage, education and other measures to minimize safety hazards. ■ Establish and implement standards addressing training and accreditation for project drivers, including contractors; driver fitness standards, including mandatory rest periods and prohibition of drug/alcohol use; in-vehicle monitoring systems to monitor vehicle speed and location; Project and contractor standards for vehicle safety and maintenance; security response for vehicle incidents; and load stability standards. ■ Consider community schedules that result in higher levels of local traffic, such as school schedules or community events; schedule truck traffic outside of these times in addition to avoiding periods of peak traffic volumes.	
4 Employment	■ Development of a Construction Labour and Working Management Plan defining process to be followed for the recruitment, training and development of local personnel. Include local content and procurement considerations to inform the Project's in-country value planning, specifically with respect to the employment potential for multiple positions and the local provisioning potential through local suppliers from the area. ■ Develop and implement a Stakeholder Engagement Plan to ensure regular, open and transparent communication with and management of all stakeholders. ■ Develop a Grievance Mechanism to ensure that individuals who have concerns or complaints about the Project or wish to report their potential expectations or concerns related to local economy and employment can communicate directly with the Project. ■ Engage with local government, and other organizations to determine opportunities for targeted training;	■ Collaborate with the other windfarm and PV developers in the development and implementation of training programs ■ If possible, share information among the different renewables projects to facilitate identification of local subcontractors and workers.
5 Climate	Positive impact	n/a

4. SUMMARY AND CONCLUSION

The CIA considered the relative contribution of the Project in terms of impacts to five VECs (Valued Social and Environmental Components) that included:

1. Avifauna (birds and bats);
2. Small Mammals (European Souslik);
3. Traffic;
4. Employment;
5. Climate.

As part of the Cumulative Impact Mitigation Strategy (Table 3-6), several broad mitigation measures to assist with informing the mitigation strategies for similar planned wind energy developments in the region that may pose a risk of cumulatively affecting the VECs identified.

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