A false start for wind energy in Uzbekistan?

A cinereous vulture (*Aegypius monachus*) nesting 400 metres from where wind turbines for the Zarafshon wind project have been proposed in Uzbekistan.
Photo: CEE Bankwatch Network, June 2022.

1. Introduction – renewable energy in Uzbekistan

According to the Strategy on the Transition of the Republic of Uzbekistan to the 'Green' Economy for the Period 2019-2030,[1] by 2030, Uzbekistan aims to double the share of renewable energy sources in its total electricity generation, bringing renewables up to 25 per cent.

In 2019, the government of the Republic of Uzbekistan signed agreements with the International Finance Corporation (IFC), the Asian Development Bank (ADB) and the European Bank for Reconstruction and Development (EBRD) to scale up solar and

[1] President of the Republic of Uzbekistan, Decree of the president of the Republic of Uzbekistan on approval of The Strategy on the Transition of the Republic of Uzbekistan to the 'Green' Economy for the Period 2019-2030, *LexUZ online*, 4 October 2019.

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wind power projects in the country through the provision of consulting services.[2] In 2021, the EBRD developed a roadmap[3] for 'A carbon-neutral electricity sector in Uzbekistan'. It recommends the construction of new fossil gas power plants end by 2030, as well as the intensive development of renewable energy and electricity storage systems. In the same year, the government of Uzbekistan and the EBRD signed a memorandum of understanding pledging cooperation to make the Uzbek energy sector carbon neutral by 2050.

In 2022, a range of wind projects in Uzbekistan with a total capacity of 1,600 megawatts (MW) was initiated for funding by international finance institutions. Thus far, the EBRD,[4] ADB[5] and IFC[6] have approved over USD 200 million in loans to Abu Dhabi Future Energy Company PJSC – also known as Masdar – to construct the 500-MW Zarafshon wind project in the Navoi region. Moreover, they attracted other financial institutions (Japan International Cooperation Agency (JICA), Natixis, First Abu Dhabi Bank) to ensure the implementation of the USD 600 million project.

Three other wind projects with a total capacity of 1,100 MW will be operated by ACWA Power[7] in the autonomous republic of Karakalpakstan and the Bukhara region, with expected financial support from the EBRD, ADB and the Multilateral Investment Guarantee Agency (MIGA). Moreover, Siemens Gamesa is building another 100-MW wind farm in the Navoi region, Turkish company ETKO CO Enerji A.S. is constructing a 600-MW wind farm in the Surhadarya region, Chinese corporation Liaoning Leader is building a 1.4-gigawatt (GW)[8] wind farm in the Bukhara region, and ACWA Power has signed an agreement with Uzbekistan's Ministry of Energy for the development of a 1.5-GW wind project in the Karakalpakstan region.[9] As of November 2022, 14 wind power projects in Uzbekistan are in various stages of development.[10]

The number of solar power projects in Uzbekistan run by Masdar, Total Eren, ACWA Power and others is also increasing thanks to extensive international investments from international finance institutions. This shows the scale of renewable energy development, which requires specific regulation and strategy in order to address potential environmental and social risks.

Below is a summary of four wind power projects to be funded by the multilateral development banks and a review of the key problems that Bankwatch identified while analysing the project documentation for each one. In addition, Bankwatch met the companies and local community representatives and visited project sites for

[2] Bekzod Asadov, Development of renewable energy sources in Uzbekistan, (Presentation, Ministry of Energy, Republic of Uzbekistan, Tashkent 2021).

[3] Corporate Solutions Limited, Guidehouse and Tractebel, *A Carbon Neutral Electricity Sector in Uzbekistan - Summary for Policymakers*, *European Bank for Reconstruction and Development*, accessed 28 November 2022.

[4] European Bank for Reconstruction and Development, Zarafshon wind, *European Bank for Reconstruction and Development*, accessed 28 November 2022.

[5] Asian Development Bank, Uzbekistan: Zarafshan Wind Power Project, *Asian Development Bank*, accessed 28 November 2022.

[6] International Finance Corporation, Zarafshon Wind, *International Finance Corporation*, accessed 28 November 2022.

[7] ACWA Power, Assets, *ACWA Power*, accessed 28 November 2022.

[8] REVE, Wind energy in Uzbekistan, *REVE*, February 8, 2020.

[9] Power Technology, ACWA Power to develop 1.5GW wind power project in Uzbekistan, *Power Technology*, 18 August 2022.

[10] Uzbekistan Energy Monitor, Projects: wind, *Uzbekistan Energy Monitor*, accessed 28 November 2022.

the Zarafshon and Bash wind projects in June 2022, and has since discussed the projects with a number of independent experts and organisations, including Birdlife International and its national chapters.

This briefing focuses on the high biodiversity risks, especially for birds, caused by the wind power projects in Uzbekistan, as the country holds important populations of several endangered, vulnerable and near threatened species. The concerns described here may also be relevant to other renewable energy projects in the country. The briefing concludes with a set of recommendations to enable the development of Uzbekistan's wind sector while minimising its harmful impacts.

This briefing reflects feedback provided by the EBRD, ADB and IFC in written form, and by Masdar and ACWA Power obtained during in-person meetings in June and October 2022.

2. Summary of the projects

	Zarafshon wind project	**Bash wind project and overhead transmission line[11]**	**Dzhankeldy wind project and overhead transmission line [12]**	**Karakalpakstan wind project[13]**
Capacity, MW	500	500	500	100 (up to 1.5 GW[14])
Administrative area	Navoi region	Bukhara region	Bukhara region	Karakalpakstan autonomous republic
Geographic area	Kyzilkum desert, Tamditau mountains	Kyzilkum desert, steep hills/cliffs from the edge of the Ayaka-gytma depression	Kyzilkum desert, Kuldzhuktau mountain range	Karatau (Sultanuizdag) mountains
Model of turbines	4.5 MW 172.5 metres (m) max height	6.5 MW Envision EN 171 ~185 m max height	6.5 MW Envision EN 171 ~185 m max height	n/a

[11] European Bank for Reconstruction and Development, Uzbekistan Bash WPP, *European Bank for Reconstruction and Development*, accessed 28 November 2022.

[12] European Bank for Reconstruction and Development, Uzbekistan Dzhankeldy WPP, *European Bank for Reconstruction and Development*, accessed 28 November 2022.

[13] European Bank for Reconstruction and Development, Uzbekistan Karakalpakstan WPP, *European Bank for Reconstruction and Development*, accessed 28 November 2022.

[14] Power Technology, ACWA Power to develop 1.5GW wind power project in Uzbekistan.

Sponsor	Shamol Zarafshan Energy FE LLC (Abu Dhabi Future Energy Company PJSC (Masdar))	ACWA Power Bash Wind LLC	FE ACWA Power Dzhankeldy Wind LLC	ACWA Power Wind Karatau LLC
Lenders	EBRD, ADB, IFC JICA, Dutch Entrepreneurial Development Bank, Natixis, First Abu Dhabi Bank	EBRD, MIGA, ADB	EBRD, MIGA, ADB	EBRD
Project cost, USD million	593.4	627	644	107.4
Environmental and social risk category	A	A	A	B
Important biodiversity areas nearby	Mount Aktau important bird area and key biodiversity area	Lake Ayakaghitma and surrounding desert important bird area and key biodiversity area	Karakyr lakes important bird area and key biodiversity area	Lower Amu Darya biosphere reserve
Planned protected areas	Aktau-Tamdy state reserve (IUCN category I)[15]		Kuldzhuktau sanctuary (IUCN category IV)	Sultanuizdag Ridge National Park Extension of Lower Amu Darya biosphere reserve

[15] Nigel Dudley (Editor), Guidelines for Applying Protected Area Management Categories, Gland, Switzerland: IUCN, 2008; Sue Stolton, Peter Shadie and Nigel Dudley, IUCN WCPA Best Practice Guidance on Recognising Protected Areas and Assigning Management Categories and Governance Types, *Best Practice Protected Area Guidelines Series No. 21*, Gland, Switzerland: IUCN (2013).

3. Lack of strategic environmental assessment

According to the United Nations Economic Commission for Europe (UNECE),[16] there is no adopted legislation for strategic environmental assessment (SEA) in Uzbekistan, only a draft law,[17] and there is a lack of overall awareness of environmental assessments, as well as capacity to coordinate SEAs, among government authorities. For example, the Strategy on the Transition of the Republic of Uzbekistan to the 'Green' Economy for the Period 2019-2030[18] includes an objective to annually define potential sites for renewable energy projects based on the technical aspects of their safe integration into the country's electricity system, without any consideration of environmental risks.

In Uzbekistan, the government usually allocates plots of land to projects before conducting an environmental impact assessment (EIA). Since 2019, the right to a plot of land may be acquired by participation in an open online auction or in accordance with the decisions of the president or the cabinet of ministers. Thus, for the Zarafshon, Bash and Dzhankeldy projects, the required plots were allocated in accordance with presidential decrees. In practical terms, this means that the location was pre-defined by the government, with just a couple of alternative sites proposed. According to the project documentation, for the Zarafshon project there was one alternative location (Nukus), whereas for the Bash and Dzhankeldy projects there were three alternatives (Nurmakhan, Aznek and Uchkuduk), which were selected by the Ministry of Energy exclusively due to wind potential, geological factors, existing infrastructure and interconnection to the grid, with no consideration of the environmental risks or impacts.

As a result, the Uzbek government significantly limited the ability of companies to address environmental risks when deciding on project locations and did not use an SEA process to avoid the most sensitive areas. At Bankwatch's meetings with Masdar and ACWA Power, both companies confirmed existing limitations on site selection. This flawed approach to site selection may partly explain the close proximity of the wind power projects to important biodiversity areas and existing or planned protected areas in Uzbekistan. After Bankwatch raised this issue, Shamol Zarafshan Energy (the subsidiary of Masdar operating the Zarafshon project) committed to engaging with the lenders and the government of Uzbekistan to find opportunities to strengthen the process of strategic environmental assessment prior to land allocation.

The IFC and EBRD also recognised the constraints on environmentally sound project site selection in their comments to this briefing, stating that the government of Uzbekistan decides on land allocations for investment projects. However, the ADB, IFC, and EBRD are actively cooperating with the Uzbek government to provide technical assistance for scaling up renewable energy projects in the country and should have an opportunity to impact the strategic development of the sector. The EBRD and IFC confirmed to Bankwatch that

[16] Martin Smutny, Results of analysis of the existing and required national capacities for introducing a national SEA system in Uzbekistan, (Presentation, online workshop, OSCE, Umwelt Bundesamt and UNECE, 8 June 2021).

[17] Government of the Republic of Uzbekistan, Drafted Law of the Republic of Uzbekistan on strategic environmental assessment, *UNECE*, accessed 28 November 2022.

[18] President of the Republic of Uzbekistan, Decree of the president of the Republic of Uzbekistan on approval of The Strategy on the Transition of the Republic of Uzbekistan to the 'Green' Economy for the Period 2019-2030.

in their communication with the government, they intend to underline the need for consideration of environmental and social issues in deciding on land allocation in Uzbekistan.

Another concern is that the IFC's, EBRD's and ADB's standards require an assessment of alternative locations as part of a site-specific environmental and social impact assessment (ESIA). The ESIAs for the Zarafshon, Bash and Dzhankeldy projects lack a comprehensive comparative assessment of the alternatives from an environmental point of view. There is no detailed comparison of the biodiversity impacts in terms of the number of impacted species and the type of impact that would occur if the project were to use alternative locations and technologies. This raises questions about the rationale behind the selection of the final sites, considering their proximity to important biodiversity areas and proposed protected areas, and the overall cumulative impact risks.

The assessment of the projects' cumulative impact has also been quite limited, as confirmed by the developers: '…there is currently very little information publicly available in relation to baseline information and potential impacts associated with other projects' (Zarafshon project ESIA). Considering the number of wind power projects expected in Uzbekistan soon, the total biodiversity risks might increase significantly, as two or more projects could have significant cumulative impacts on a number of species. Despite the commitment 'to engage with other wind farm projects in both data gathering and sharing exercises (to understand ranges of individual birds) as well as providing a combined approach to mitigation', the layout of all the projects has already been finalised without addressing the cumulative impact risks.

4. Impacts on protected areas

International financial institutions' environmental and social standards require that projects do not compromise the integrity, conservation objectives and/or biodiversity importance of legally protected and/or internationally recognised areas. This requirement applies to projects situated within such areas or projects that have the potential to affect these areas adversely. Moreover, the provision also applies to proposed but not yet legally protected areas.

Zarafshon wind project

A small area of the Tamdytau mountains (around 4,000 hectares) is already protected as two internationally recognised areas: Mount Aktau important bird area (IBA)[19] and Mount Aktau key biodiversity area (KBA).[20] The project might significantly impact biodiversity because it is only 3.5 kilometres from the IBA/KBA and twice the area of the IBA/KBA. Moreover, vultures and falcons, the species for which the IBA was created, use the project site during various parts of their life cycle. The project impact assessment should be based on up-to-date data on the number of individual birds from the IBA currently using the project area, evaluate the impact's

[19] BirdLife International, Important Bird Areas factsheet: Mount Aktau, *BirdLife International*, 18 November 2022.

[20] Key Biodiversity Areas Partnership, Key Biodiversity Areas factsheet: Mount Aktau, extracted from the *World Database of Key Biodiversity Areas*, accessed 18 November 2022. Developed by the Key Biodiversity Areas Partnership: BirdLife International, IUCN, American Bird Conservancy, Amphibian Survival Alliance, Conservation International, Critical Ecosystem Partnership Fund, Global Environment Facility, Global Wildlife Conservation, NatureServe, Rainforest Trust, Royal Society for the Protection of Birds, World Wildlife Fund and Wildlife Conservation Society.

significance and suggest effective mitigation measures. As the ESIA report, Environmental and Social Management and Monitoring Plan, and Environmental and Social Action Plan lack information on the movement of birds between the IBA and the project site, it is impossible to appropriately assess the project's future impacts on the IBA.

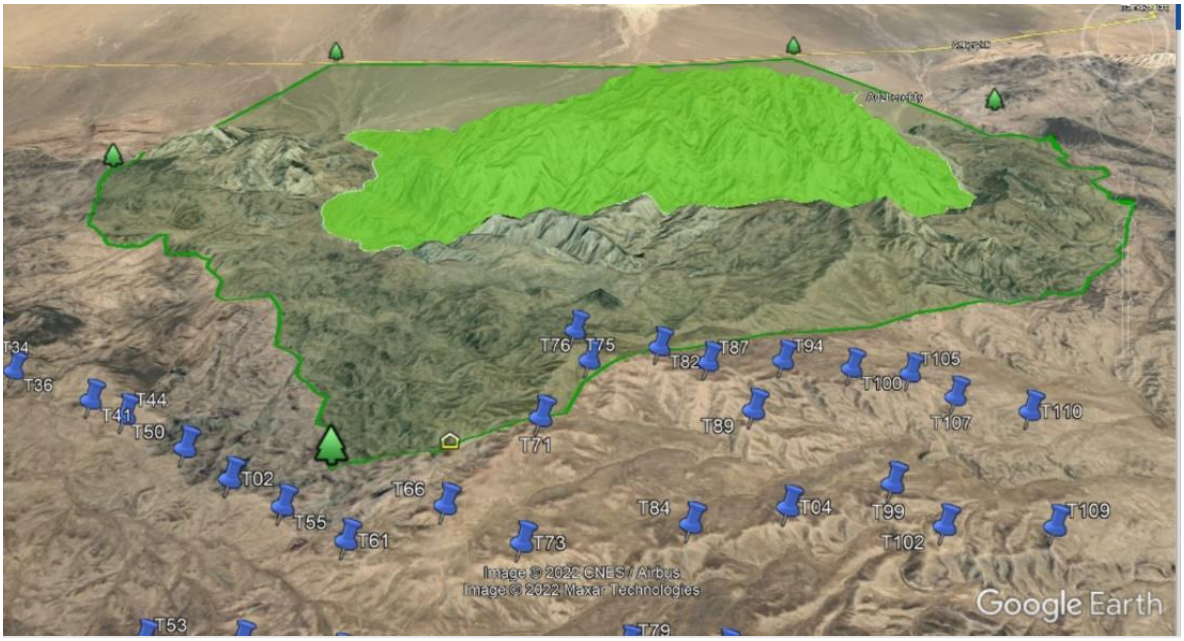
More importantly, the Tamdytau mountains surrounding the Zarafshon project site were proposed for protection under national legislation by the project Important Bird Areas of Uzbekistan (2007-2008) and the GEF-UNEP WWF project Development of the econet as a basis for long-term conservation of the biodiversity of the Central Asian ecoregion (2003-2006).[21] According to the maps of Uzbekistan produced by the latter project, a state reserve, the core zone of the Tamdytau National Park (26,000 hectares), was proposed (see map number 20) in order to protect Severtzov's sheep (Ovis ammon severtzovi) and other species. In 2013, the UNDP-GEF project Strengthening the Sustainability of the National Protected Area System by Focusing on Strictly Protected Areas22 also recommended the creation of a protected area called Aktau (Tamdy) in the Tamdy district (Map 1). In the rationale, many endemic and threatened species are mentioned. Should the Aktau-Tamdy protected area be created, some of the Zarafshon project's wind turbines (T75A and T76) would be located within the protected area (Map 2).

Map 1. Proposed location of Aktau (Tamdy) protected area. Source: UNDP-GEF, 2013.[23]

[21] World Wildlife Fund, Development of the Econet for long-term conservation of biodiversity in the Central Asia Ecoregions, *World Wildlife Fund*, accessed 28 November 2022.

[22] Natalya Beshko, V. Zagrebin, A. Popov, Furkat Khassanov, O. Mitropolskaya and K. Magdiev, 'Рекомендации По Расширению Системы Охраняемых Природных Территорий в Узбекистане', December 2013.

[23] Beshko, Zagrebin, Popov, Khassanov, Mitropolskaya and Magdiev, 'Рекомендации По Расширению Системы Охраняемых Природных Территорий в Узбекистане'.



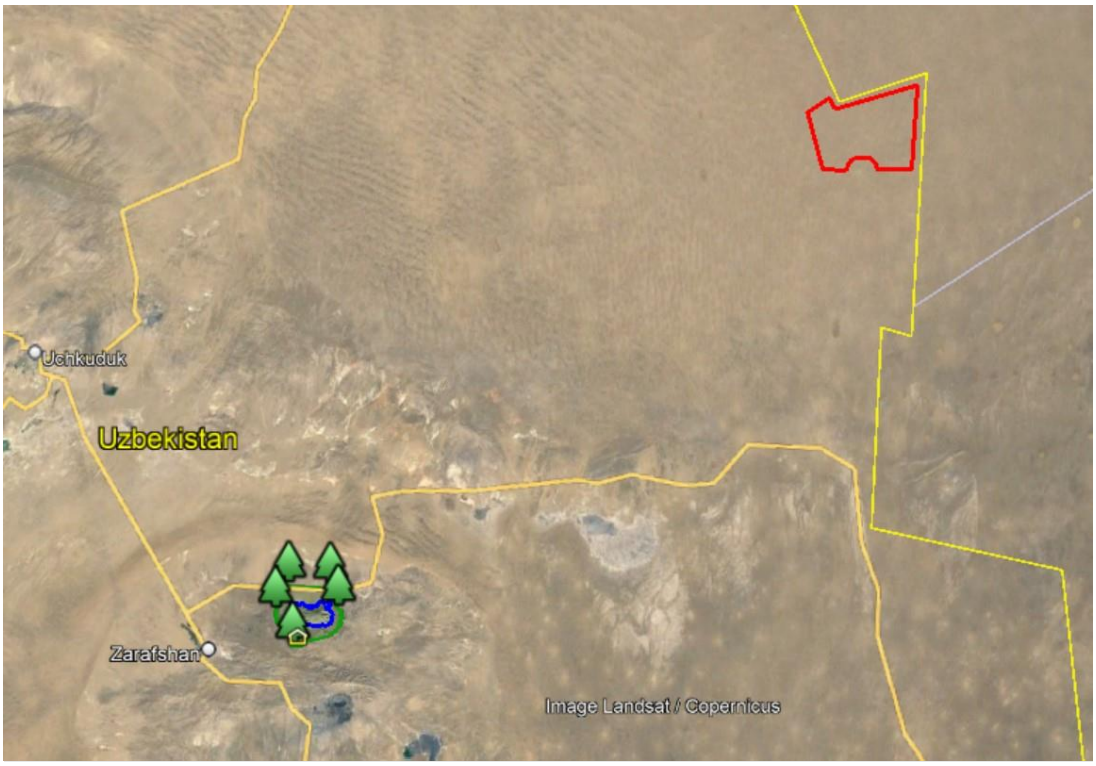
Map 2. Turbines T75A and T76 are within the borders of the planned Aktau-Tamdy protected area (wide green line). Mount Aktau IBA is 3.5 km further away (light green polygon).
Source: Zarafshon wind project, ESIA and CEE Bankwatch Network, Google Earth.

International organisations like the United Nations Development Programme (UNDP) have been directly involved in communicating with the government of Uzbekistan to push forward the process for the creation of the new protected areas.[24]

In February 2022, a presidential decision declared a 40,000-hectare piece of pastureland in the Tamdy district the Aktau-Tamdy state reserve, but without specification of the exact location.

However, in a written communication to Bankwatch from 17 August 2022, the EBRD claimed that the Aktau-Tamdy state reserve would not be located within the project site, but over one hundred kilometres away from the site. A map provided by Masdar on 8 October 2022 confirmed that the new protected area would be located in the Tamdy district, but next to the border with Kazakhstan. This is part of the Kyzylkum desert, away from the Tamdytau mountains, in a place that had never previously been proposed for protection and, to the best of our knowledge, has no geographical names related to 'Aktau' (Map 3). In its response to Bankwatch from 15 November 2022, the IFC also confirmed that the project would not overlap with the protected area.

[24] United Nations Development Programme, Final evaluation Strengthening Sustainability of National Protected Area System by Focusing on Strictly Protected Areas, *United Nations Development Programme*, August 2013.



Map 3. The new borders of the state reserve (in red) and the original borders (in green). Mount Aktau IBA (in blue) is completely within the original borders.
Source: UNDP-GEF, new borders provided by Masdar and CEE Bankwatch Network, Google Earth.

The Zarafshon wind project ESIA does not contain any assessment of the project's impact on the proposed protected area. Therefore, despite the significant scientific evidence justifying its proclamation, it seems that the Aktau-Tamdy state reserve's location has been changed and it is no longer near the Zarafshon project site. The financial institutions and project promoters Bankwatch communicated with referred only to the relevant Uzbek authorities when providing clarification on the exact location of the proposed protected area, despite the availability of advanced scientific studies justifying the creation of the protected area Aktau-Tamdy next to the Zarafshon project area. Although a new protected area will be created in a different location, it will not protect the critical biodiversity in the formerly proposed location from the impacts of the wind power plant.

In addition, there are plans to use the mountains in the vicinity of the wind power plant for other projects that could impact biodiversity, such as metal mining. One of the largest gold mines in the world is already located around 7 kilometres southeast of the project site. The surrounding areas could also be used for the placement of additional wind projects once the Zarafshon wind farm is built.

Bash wind project

According to the ESIA report,[25] this project will be located east and northeast of Lake Ayakagitma. The site is approximately 0.5 kilometres east of the lake at its closest point and is partially within the Ayakaghytma lake and surrounding desert IBA[26] and KBA.[27] The exact location of the turbines was modified during the ESIA process.

The ADB, in its response to Bankwatch, confirmed that 'all turbines have been set back at least 2 [kilometres] from the lake and a minimum of 750 [metres] from active nests of bird species of conservation concern following the completion of the relevant surveys'. Nevertheless, 34 turbines will still be located at a very risky distance (less than 2 kilometres) from the IBA borders and the cliffs that are important for the nesting of protected birds. To the best of our knowledge, nests found in 2022 were not taken into account when making the decision to set the turbines back from the lake. Furthermore, seven of the proposed turbines will be closer than 185 metres (equal to the height of the turbines) from the border of the IBA and the cliff edge, making their impacts almost impossible to mitigate (Map 4).

Map 4. The 34 turbines closest to the Ayakaghytma lake IBA; the rest are further east (not shown on the map). Source: Bash wind project, ESIA and CEE Bankwatch Network, Google Earth.

Despite the ADB's claim that 'impacts on all bird species at these IBAs which are particularly susceptible to collision, have been carefully quantified, based on extensive VP [vantage point] surveys', the ESIA report lacks a comprehensive assessment. It remains unclear how many of the 12 trigger species will be affected and in what way. Considering that many of them migrate at night (i.e. Sykes's warbler (*Iduna rama*), the Asian desert warbler

[25] ACWA Power, Bash Wind IPP, *ACWA Power*, accessed 28 November 2022.

[26] BirdLife International, Ayakaghytma lake and surrounding desert, *BirdLife International*, accessed 28 November 2022.

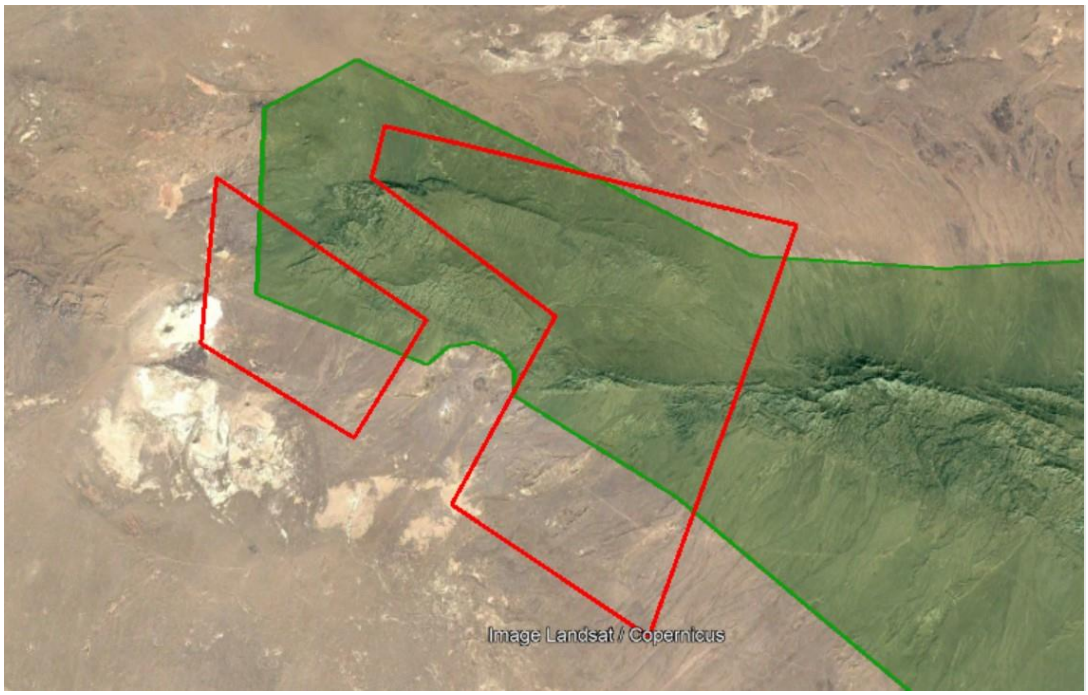
[27] Key Biodiversity Areas Partnership, Key Biodiversity Areas factsheet: Ayakaghytma lake and surrounding desert, extracted from the *World Database of Key Biodiversity Areas*, accessed 18 November 2022. Developed by the Key Biodiversity Areas Partnership: BirdLife International, IUCN, American Bird Conservancy, Amphibian Survival Alliance, Conservation International, Critical Ecosystem Partnership Fund, Global Environment Facility, Global Wildlife Conservation, NatureServe, Rainforest Trust, Royal Society for the Protection of Birds, World Wildlife Fund and Wildlife Conservation Society.

(*Sylvia nana*), the greater sandplover (*Charadrius leschenaultii*), etc.)[28] and will probably fly between several IBAs (Ayakaghytma lake, Aydarkul lake, Karakyr lakes), crossing the Bash wind project area, the impacts might increase significantly.

Cameras and ornithologists have significant limitations that prevent them from spotting birds that migrate at night to avoid/mitigate the impacts of projects like this. Additionally, as explained in the next chapter, using vantage point surveys without up-to-date nest surveys and satellite tagging has significant constrains.

Dzhankeldy wind project

This project will be located in the southeastern part of the Kyzylkum desert on the Kuldzhuktau mountain range, in the Peshku, Uchkuduk and Kanimekh districts of the Bukhara region. According to the recommendations of the UNDP-GEF project Strengthening the Sustainability of the National Protected Area System by Focusing on Strictly Protected Areas (2013), the Kuldzhuktau sanctuary (174,157 hectares) was proposed as an example of the arid Kyzylkum low mountains (highest elevation: 876 metres).[29] In the rationale, paleontological, botanical and zoological reasons are given to underline the importance of declaring the area: 'in the current protected areas system of Uzbekistan, a similar landscape is not represented'. More than half the area of the wind project is within the proposed borders of the Kuldzhuktau protected area (Map 5).



Map 5. Borders of the Dzhankeldy project site (red) and Kuldzhuktau proposed sanctuary (green).
Source: Dzhankeldy wind project, ESIA and CEE Bankwatch Network, Google Earth.

[28] Pavel Zehtindjiev, 'Nocturnal autumn migration of waterbirds (Anseriformes and Charadriiformes) in North-Eastern Bulgaria', *Ardeola* 48, no. 1 (2001): 1-10.

[29] Beshko, Zagrebin, Popov, Khassanov, Mitropolskaya and Magdiev, 'Рекомендации По Расширению Системы Охраняемых Природных Территорий в Узбекистане'.

The proposed Kuldzhuktau sanctuary and the project's potential impact on it was not assessed in the ESIA.

The wind project is located 20 kilometres north of the Karakyr lake[30] (a KBA).[31] Considering all the water-related birds observed during the survey of vantage points as part of the ESIA study, we can assume that the project would impact these internationally recognised areas. The project impact assessment should be based on up-to-date data on the IBA and KBA, particularly the number of individual birds belonging to trigger species currently using the project area, to evaluate the impact's significance and suggest effective mitigation measures. However, the ESIA report lacks this information.

The ADB, in its response to Bankwatch, claims that the impact on most of the waterbird species will be insignificant due to the very large population, but such an assumption is based on a potential biological removal analysis that is not site-specific.

According to the ESIA report,[32] 'the site at Dzhankeldy was also selected due to... the location of the site away from protected areas, Important Bird Areas (IBAs) or Key Bird & Biodiversity Areas (KBAs)'. But given that the proposed protected area of Kuldzhuktau and the impacts on the IBA/KBA have not been taken into account, we consider this a false premise.

Karakalpakstan wind project

Along the Amu Darya River next to the ridge planned for wind power development, there is an internationally recognised area called the Lower Amu Darya Biosphere Reserve, which was included in the network of biosphere reserves under the UNESCO Man and the Biosphere (MAB) program (2021).[33] Earlier, the WWF programme Econet proposed the creation of a national park called Sultanuizdag Ridge, which is part of the Central Kyzylkum zone.[34] The UNDP-GEF project Strengthening the Sustainability of the National System of Protected Areas by focusing on nature reserves proposed the site for protection for botanical reasons.[35]

Four endemic plant species grow in the area (*Allium sultanuizdaghi, Scorzonera bungei, Lappula parvula, Cousinia umbilicata*), as do nine subendemic species (*Jurinea persimilis, Cleome quinquenervia, Astragalus holargyreus, Astragalus remanens, Limonium lessingianum, Calligonum zakirovii, Lappula aktaviensis, Salsola chiwensis, Astragalus ammodendron*) and the relict species *Asparagus turkestanicus*. The presence of these

[30] BirdLife International, Important Bird Areas factsheet: Karakyr Lakes, *BirdLife International*, accessed 28 November 2022.

[31] Key Biodiversity Areas Partnership, Key Biodiversity Areas factsheet: Karakyr Lakes, extracted from the *World Database of Key Biodiversity Areas*, accessed 18 November 2022. Developed by the Key Biodiversity Areas Partnership: BirdLife International, IUCN, American Bird Conservancy, Amphibian Survival Alliance, Conservation International, Critical Ecosystem Partnership Fund, Global Environment Facility, Re:wild, NatureServe, Rainforest Trust, Royal Society for the Protection of Birds, World Wildlife Fund and Wildlife Conservation Society.

[32] ACWA Power, Dzhankeldy Wind IPP, *ACWA Power*, accessed 28 November 2022.

[33] United Nations Educational, Scientific and Cultural Organisation, Lower Amudarya State Biosphere Reserve, *United Nations Educational, Scientific and Cultural Organisation*, January 2021.

[34] World Wildlife Fund, Development of the Econet for long-term conservation of biodiversity in the Central Asia Ecoregions.

[35] Beshko, Zagrebin, Popov, Khassanov, Mitropolskaya and Magdiev, 'Рекомендации По Расширению Системы Охраняемых Природных Территорий в Узбекистане'.

species characterises the flora as unique, and the area was proposed by the UNDP-GEF project as a cluster area of the Lower Amu Darya Biosphere Reserve for the conservation of botanical diversity.

However, despite the recommendations, the area has not been included in Uzbekistan's protected area list and continues to be developed for mining and wind projects. As no project documentation was disclosed by the EBRD, it is unclear if the Karakalpakstan wind project environmental impact assessment took the proposed protected areas into consideration.

5. Impacts on globally and nationally threatened bird species

All the wind projects are located in core areas of threatened bird species, with impacts especially significant due to turbines situated close to nests of Egyptian, cinereous and bearded vultures; Eastern imperial and golden eagles; and saker falcons. The new transmission lines for the Bash and Dzhankeldy projects might pose a significant collision risk for the Asian houbara bustard and other species. The Bash project's 34 turbines on the edge of the Ayakagytma lake IBA might threaten a variety of water-related birds.

In a response to Bankwatch dated 15 November 2022, the IFC acknowledged that '[the Zarafshon project area] is an important area for a number of raptors' and committed to 'implementing the mitigation hierarchy, starting with avoidance by moving 15 turbines'. However, as Masdar explained to Bankwatch during a workshop in November 2022, these turbines were moved away based on the findings of 2021 nest survey – not the one finalised in 2022, which found new nests in areas close to proposed turbine sites.

This was the case at the other project sites as well – the detailed nest surveys were done in 2022, when the locations of the wind turbines were already fixed in the ESIA reports. After the 2022 nest survey at Dzhankeldy, for example, the ESIA study was updated with several new nests found, but, according to the updates to the ESIA, 'turbines could not be microsited further away from the known nesting locations due to technical and economic constraints'.[36] This raises questions about the relevance of the proposed avoidance and mitigation measures.

In addition, the bird assessments that were conducted did not use the best methodology available. The assessments in the ESIA reports on the Zarafshon, Bash and Dzhankeldy projects apply NatureScot's methodology to produce collision risk models. This methodology is insufficient and not adapted to the local conditions (species roaming over vast desert habitats to search for often scarce food, raptor nests in the vicinity of turbines, etc.).

In general, the best international practices (on-time nest search, core area delineation, satellite telemetry) were not used when assessing the impacts on nesting birds. The core area is recognised as the most vital area for

[36] 5 Capitals, Summary of Material Updates to the ESIA package, *ACWA Power*, September 2022.

population survival, and consequently, its biologically meaningful delineation is of great importance for robust conservation decision-making and spatial planning.[37]

In response to these assessments, the wind turbines were not moved away from the core areas of the key species, but rather some minimal buffers from the active nests were proposed: 500 metres (Zarafshon), 750 metres (Bash), and 750 metres 'where possible' (Dzhankeldy). Even more, to the best of our knowledge, no turbines were moved away when new nests were found in 2022, including by Bankwatch experts.

The collision mortality predicted in the population core area accounted for almost all (98 per cent) of collision mortality of cinereous vultures in a study of Vasilakis et al. (2017) from Greece.[38] The authors recommend excluding the population core area from development for future wind farms and using remote telemetry to map the core areas of critical species. For the cinereous vultures in Greece, the core area was between 10 and 40 kilometres from the nesting colony in Dadia National Park. The Greek study is well known to the authors of the Zarafshon ESIA report (cited on page 110), but the recommendations of the article were not taken into account.

In its response to Bankwatch, the IFC claimed that 'defining core areas for breeding raptors on a landscape-scale and the use of satellite telemetry is not typically employed or expected on project specific impact assessments for wind energy in many countries' but agreed 'that implementing strategic policy based on defined core population areas for species like Cinereous Vulture is an approach to be recommended where this type of research is available'. Nevertheless, this response confirms that for the Zarafshan project, core detailed studies were not available by the time the Uzbek government made a decision on land allocation. This proves that the precautionary principle was not implemented to avoid impacts on key species. For example, Vasilakis et al. recommend moving turbines at least 10 kilometres away from the nests of cinereous vulture, whilst the lenders at Zarafshan 0.5 kilometres.

Another concern is the probability of extinction calculation. All the wind projects are in desert areas where the birds roam over considerable areas to find food. If one Egyptian vulture is killed, it will probably never be substituted by another in the breeding pair and the species will not occupy the territory again, reducing the local population. In a study from Spain, the whole national population of Egyptian vultures was assessed in order to predict how wind turbine mortality would affect the population size and probability of extinction.[39] The risky zone (i.e. the maximum distance from the nest at which a wind farm killed a territorial Egyptian vulture) for the species was 15 kilometres. The study demonstrated how very low reductions in survival rates of territorial and non-territorial vultures associated with wind farms could have significant population impacts and advocates for the consideration of the precautionary principle by avoiding a priori all turbines located within a 15-kilometre radius of nests (the equivalent to the risky zones). According to the same study, the most

[37] Eric Vander Wal and Art Rodgers, 'An individual-based quantitative approach for delineating core areas of animal space use', *Ecological Modelling* 224, no 1.

[38] Dimitris Vasilakis, D. Philip Whitfield, Stefan Schindler, Kostas Poirazidis, and Vassiliki Kati, 'Reconciling endangered species conservation with wind farm development: Cinereous vultures (Aegypius monachus) in south-eastern Europe', *Biological Conservation* 196 (2016): 10-17.

[39] Martina Carrete, José Sánchez-Zapata, Rafael Arenas González, Manuel Lobón and José Donázar, 'Biological Conservation - BIOL CONSERV. 142. 10.1016/j.biocon.2009.07.027. Large scale risk assessment of wind-farms on population viability of a globally endangered raptor', *Biological Conservation* 142 (2009).

effective action would be to avoid wind. In Spain, stopping turbines has been completely ineffective in cases of solitary territorial birds.

Probably the most underestimated impact is on the globally endangered saker falcon. The proposal from the EU and its Member States to include the saker falcon in Appendix I of the Convention on the Conservation of Migratory Species of Wild Animals (CMS) states that 'Both in the breeding and wintering areas more and more wind farms are established on the open areas often in co-incidence with Sakers' preferred habitats'. In the same proposal it is written than 'Hungarian studies show that adult Sakers are rather showing an avoiding behaviour so those areas between the wind mills are lost habitats for them, even if there is plenty of food there. Juveniles are less afraid of wind mills. However, this is the reason why they are more exposed to the risk of collision with the turbines.'[40]

A significant percentage of the Uzbek population of the species breeds in or close to the project sites,[41] and the implementation of wind power projects may result in habitat loss and the abandonment of nests. This is especially worrying because the rapid global population decline is particularly marked in the Central Asian breeding grounds and, according to the aforementioned document, Uzbekistan – with a 90 per cent decline in population since 1990 – is on the list of countries with a particular cause for concern. In all three ESIA studies (Zarafshon, Bash and Dzhankeldy), saker falcon nests are reported, and exact nest locations are given. The disturbance of birds and the robbing of nests is a huge risk created by the ESIA studies. For all raptor species, disturbances during preparatory works and construction and maintenance of wind turbines (and shutdown on demand systems) could be as significant as the collision risk.

In the response to Bankwatch, the IFC claimed that 'the project area is not regularly used by the species and may not be high-quality hunting habitat' and stated that there is also the 'availability of similar habitat outside the project site'. According to Mátyás J. Prommer from the School of Natural Resources and Environment, University of Florida/IFAS, the available habitat could considerably change between years depending on the multiannual population cycles of rodents, the main food source for saker. During years where there are population outbreaks of rodent species (once every three to five years), many pairs could be attracted to feed in the project areas. However, these specifics have not been addressed by the ESIA.

Moreover, some species of international importance are not covered in the ESIA. In the EBRD's policy, it is written that the 'EBRD is committed to ensuring that projects are structured to meet EU environmental principles, practices and substantive standards, where these can be applied at the project level, regardless of their geographic location'. This means that the project should not cause significant impacts on any species from Annex 1 of the EU Birds Directive, including species like the greater flamingo (*Phoenicopterus roseus*), long-legged buzzard (*Buteo rufinus*) and Kentish plover (*Charadrius alexandrinus*).

[40] Proposal for inclusion of species on the Appendices of the Convention on the Conservation of migratory species of wild animals, *Convention on the Conservation of Migratory Species of Wild Animals*, accessed 28 November 2022.

[41] Red book of the Republic of Uzbekistan, vol. 2, 2009, 160.

Zarafshon wind project

Zarafshon wind project area – the wind turbines would be located on the plateau. The birds' nests are on the cliffs just below. Photo: CEE Bankwatch Network, June 2022.

We visited the project site in June 2022. It is located within one of the areas with the highest concentration of species of conservation concern in Uzbekistan. The critical habitat assessment report (Appendix 6-2 to the ESIA)[42] considers 11 bird species there to be priority biodiversity features.

There are several studies on birds included in the ESIA report: a scoping visit conducted in October 2019 by Turnstone Ecology, vantage point surveys conducted by the in-country team from Juru Energy between March 2020 and June 2021, and a partial 28-day search for raptor nests in August 2020 and between March and June 2021. The main conclusions in the ESIA were based on the collision risk modelling following a methodology developed by NatureScot and the British Wind Energy Association (BWEA).

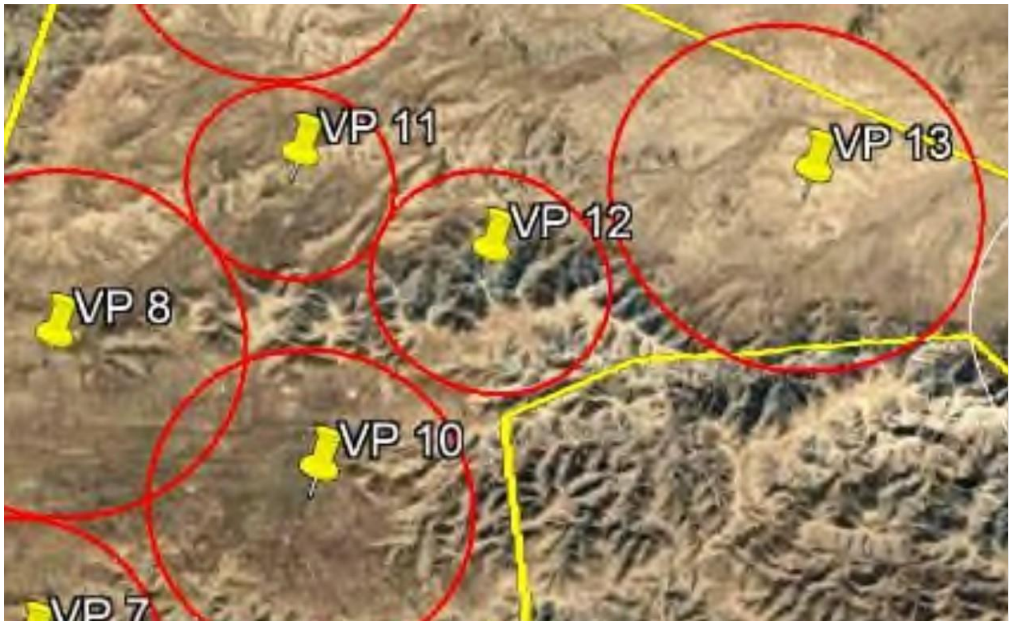
A limited search for raptor nests took place in 2021 and a more substantial study in 2022. According to the ESIA report, the 2022 results should have been finalised in July, but as of November 2022, have not yet been published. According to the ESIA, wind turbines will not be constructed within 500 metres of nests of selected bird species, so the results from 2022 could substantially modify the project design. Without this study, the ESIA

[42] Masdar, ESIA Appendices, *Masdar*, accessed 28 November 2022.

report cannot be considered complete. Objective, timely and sufficient knowledge of all the nests in the vicinity of the proposed turbines is key to planning proper avoidance and mitigation measures. Bankwatch's observations during the site visits in June 2022 confirmed the need for more comprehensive and up-to-date nest surveys – some nesting areas have been discovered in close proximity to the proposed location of the turbines. As the IFC noted in its response to Bankwatch, 'survey of active breeding sites is an on-going process', but when there is lack of good baseline data, the decisions on the final placement of turbines could be wrong.

Moreover, the collision risk modelling using only vantage point surveys would not work in rugged terrain with extremely sensitive species like the saker falcon and bearded vulture. If a nest is located close to a vantage point observer, the birds might not fly at all when they are present or, even worse, they may abandon the nest. This, together with putting the GPS coordinates of nests in the ESIA report, could significantly increase the risk of the nest being abandoned. In the ESIA study, several nests were reported to have been abandoned over the past two years.

Despite the IFC's awareness of the need to avoid placing the vantage points near the nests (IFC response to Bankwatch) some of them remain located in close proximity: vantage point (VP) 12 (Map 6) will be 120 metres from a cinereous vulture nest and 270 metres from an Egyptian vulture nest found by Bankwatch experts in 2022, as well as 410 metres from an old saker falcon nest reported in the ESIA.



Map 6. Vantage point 12 located just above the cliffs crucial for nesting of endangered birds
Source: ESIA Appendix 5-1 Juru Ornithology Report, 2020.

From our observations, findings from previous studies and the ESIA report, we can conclude that birds of prey and vultures nest on the cliffs close to and even within the project site. Some birds that breed in the Mount Aktau IBA and Aktau-Tamdy planned state reserve feed on the plateau where the wind turbines are planned. We observed plenty of food sources: carcasses of livestock and wild animals, yellow ground squirrels

(*Spermophilus fulvus*) and other small mammals, steppe tortoises (*Testudo horsfieldii*, globally vulnerable), other reptiles, large populations of chukar (*Alectoris chukar*), larks and other birds. In total, 35 chukar (including a group with more than 20 chicks) were found in almost all rocky habitats near the project site.

On only one morning, within the eastern part of the project site, did we discover active nests of saker falcons (Falco cherrug, globally endangered), Egyptian vultures (Neophron percnopterus, globally endangered) and cinereous vulture (Aegypius monachus, globally near threatened). These were within less than 350 metres of the proposed wind turbines. We found other Egyptian and cinereous vultures, as well as a golden eagle (Aquila chrysaetus) in the south part of the project site. According to the ESIA report: 'No areas used by nesting raptors are being lost as a result of the Project based on current data' (page 152). Yet this conclusion is based on insufficient data (an incomplete raptor nest survey) and the assumption that a 500-metre buffer around turbines is enough to avoid impacts on nesting birds. But a complete raptor nest search and other additional studies are necessary to understand the risks to the threatened bird species.

Nests of cinereous vultures, Egyptian vultures and saker falcons at Zarafshon wind project.
Photo: CEE Bankwatch Network, June 2022.

Based on information provided by Bankwatch in October 2022, the IFC committed to study the recent results of the raptors surveys and revise the plans to safeguard all active breeding attempts.

According to an article from Spain, one general recommendation is that each new wind power facility project should include a detailed study of bird behaviour, as bird mortality depends on local terrain, positioning of turbines, seasonal differences in lifting currents and many other factors.[43] The ESIA lacks specialised studies on the usage of the area by key bird species, and no core areas are defined. The best international practices include satellite telemetry, and at the very least, satellite tracking should be performed for local pairs of the globally endangered Egyptian vultures and saker falcons.

[43] Luis Barrios and Alejandro Rodríguez, Behavioural and environmental correlates of soaring-bird mortality at on-shore wind turbines, *Journal of Applied Ecology*, 12 February 2004.

Bash wind project

The Bash wind project turbines would be located just above the loess cliffs of Ayakaghytma lake IBA, threatening raptors' nests. Photo: CEE Bankwatch Network, June 2022.

We visited the project site and the Ayakaghytma lake in June 2022 and confirmed the importance of the IBA. We counted 45 waders from six species, including 30 Kentish plovers (*Charadrius alexandrinus*, Birds Directive species), six great sand plovers (*Charadrius leschenaultii*, IBA trigger species) and six black-winged stilts (*Himantopus himantopus*, Birds Directive species) on 1 kilometre of shoreline. All of them were breeding there. Additionally, two Egyptian vultures, one imperial eagle and one long-legged buzzard were roaming east of the lake. Other IBA trigger species were common in the lake's shrubs, like Syke's warblers (*Iduna rama*) and desert finches (*Rhodospiza obsoleta*). A birdwatcher observed the globally vulnerable marbled teal (*Marmaronetta angustirostris*) at the site a few days earlier.[44] In contrast, in the eastern part of the project area, primarily east of the train line, we observed relatively poor avian diversity.

[44] Martin O'Hanlon, Ayakagitma ko'li [Ayakagytma Lake], Buxoro, Uzbekistan, *eBird*, 30 May 2022.

Two Kentish plovers and one great sand plover at Ayakaghytma lake.
Photo: CEE Bankwatch Network, June 2022.

The final configuration of the Bash project includes 79 turbines of 6.5 MW each. During the ESIA process, the number of turbines was reduced, but the size of each was increased. The minimum distance to the Ayakaghytma lake in the final configuration would be 2 kilometres, and a buffer of 750 metres from reported active nests of Egyptian vultures, Eastern imperial eagles and golden eagles was included.

As in the case of the Zarafshon wind project, vantage point and transect surveying were undertaken using NatureScot methods to provide adequate data for developing collision risk models. The problem is that the raptor nest search was not completed on time and has continued into 2022. The results from this last survey are not included in the final version of the ESIA report, meaning that adequate avoidance/mitigation measures have not been planned. Moreover, previous studies have already found five nests of Egyptian vultures, two of golden eagles, three of long-legged buzzards and two of saker falcons. On the map from the 2018 study, the appropriate nesting cliffs are shown in red. More than half of those are in the vicinity of the planned turbines (Map 7).[45]

[45] Anna Ten and Valentin Soldatov, 'The Practice of Identifying a Nesting Biotope for Raptors in the Central Part of the Kyzylkum Desert Using the GIS Technology', *Raptors Conservation* (2019): 34-42.

Рис. 4. *Местоположение гнёзд хищных птиц относительно крутизны склона 12–63° на лёссовых обрывах впадины Аякагытма.*

Fig. 4. *Raptors nest locations in relation to slope 12–63° in loess biotope of Ayakaghytma depression.*

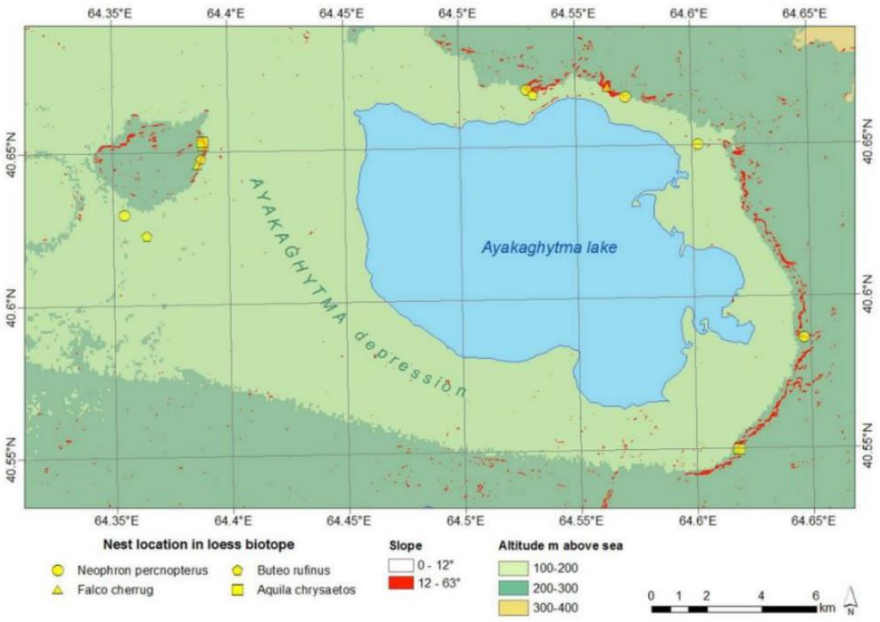


Fig. 13 Raptors nest locations in the cliffs near Agitma lake in Spring 2018[3]

Map 7. Raptors' nest locations in the cliffs near Agitma lake in Spring 2018.
Source: Anna Ten and Valentin Soldatov, 2019.

As described in the previous chapter, 34 turbines (43 per cent) are on the border of the IBA within 0.1 to 2 kilometres of the most important cliffs/loess for the nesting of birds of prey and vultures.

There are two additional problems looming over the Bash wind project. Firstly, many water-related birds use Ayakaghytma lake during breeding, migration and wintering. Many of these birds migrate during the night (waders, waterfowl, passerines) and/or are very susceptible to collision with wind turbines (flamingos, white-tailed sea eagles etc.). In a study from Norway, four of 36 white-tailed eagles (*Haliaeetus albicilla*) were killed by turbines, reducing the local population from 13 pairs to five.[46]

The position of the 34 Bash turbines on the high plateau above Ayakaghytma lake and their size (approximately 185 metres in height) make them a trap for water-related birds that is almost impossible to mitigate. Birds flying from the lake in the direction of the Aydarkul lake IBA would pass through the turbines from underneath with little visibility. As such, these 34 turbines should be moved further east to avoid significant impacts.

Additional studies of night migration and wintering birds need to be carried out. Even without them, it is clear that the IBA is on an important migration route – a total of 11,786 individual birds were observed passing through the site throughout the surveying period of 1,092 hours of observation, which can be extrapolated to almost 100,000 birds per year.

[46] Torgeir Nygård, et al., 'A study of White-tailed Eagle Haliaeetus albicilla movements and mortality at a wind farm in Norway', *BOU Proceedings – Climate Change and Birds*, 2013.

An additional problem of the Bash project is the wind farm's location, especially the overhead transmission lines that will cross the prime habitat of the Asian houbara bustard (*Chlamydotis macqueenii*, globally vulnerable[47]). The length of the transmission line between the Dzhankeldy and Bash wind projects is 128.5 kilometres, and the line from Bash to Karakul is 162 kilometres long. Nevertheless, the vantage point study was done only for the wind turbine area, not along the transmission lines. This leaves uncertainty about how many houbaras are at risk during the different seasons. Additional year-round studies on houbaras with vantage points covering all the lengths of the transmission lines need to be carried out.

The ESIA report mentions that the fatality monitoring plan will include potential biological removal thresholds for species of concern, including the Asian houbara bustard. However, there is a risk that removing even one individual of scarce breeders, like Egyptian vulture or houbara, from the Kyzylkum desert could significantly impact the local population there.

The ESIA report considers the following birds to be priority biodiversity features: Egyptian and Eurasian griffons; cinereous vultures; steppe, greater spotted, Eastern imperial, white-tailed, booted and golden eagles; saker falcons; white-headed ducks; and great white pelicans, whereas Asian houbaras trigger the critical habitat requirement. The ESIA for the Bash to Karakul transmission line considers Egyptian vultures and steppe and short-toed eagles to be protected biodiversity features, whereas Asian houbaras trigger the critical habitat requirement.

Dzhankeldy wind project

The Dzhankeldy project has the same promoter, ESIA experts and studies on birds as the Bash project does, so there are many shared methodological problems. One significant difference is that not all turbines within 750 metres of active tier 1 nests would be moved, but only 'when possible'. Additionally, a saker falcon nest from 2018 was not considered despite being located between 279 and 615 metres from three proposed turbines (DZH02, DZH01, DZH03). Another inactive nest was found 167 metres from DZH63 and 650 m from DZH62. The response to these cases on page 263 of the ESIA report is: 'the current ongoing nesting surveys for 2022 will further confirm the importance of these known previous nesting sites and the need, if any, to implement upfront [shutdown-on-demand] for Tier 1 species during the active breeding season for these [wind turbine generators].' This means that no change in the location of the turbines is anticipated, even if saker falcons or Egyptian vultures return to their nests.

The ESIA report considers the following birds to be priority biodiversity features: Egyptian, cinereous and Eurasian griffon vultures; steppe, greater spotted, Eastern imperial, white-tailed, short-toed and golden eagles; saker falcons; common pochards; and great white pelicans. The Asian houbara triggers the critical habitat requirement. The ESIA for the Dzhankeldy to Bash transmission line considers Egyptian vultures and steppe, Eastern imperial, white-tailed, short-toed and golden eagles to be priority biodiversity features, while Asian houbaras trigger the critical habitat requirement.

[47] BirdLife International, Chlamydotis macqueenii, *The IUCN Red List of Threatened Species 2021*, 18 August 2021.

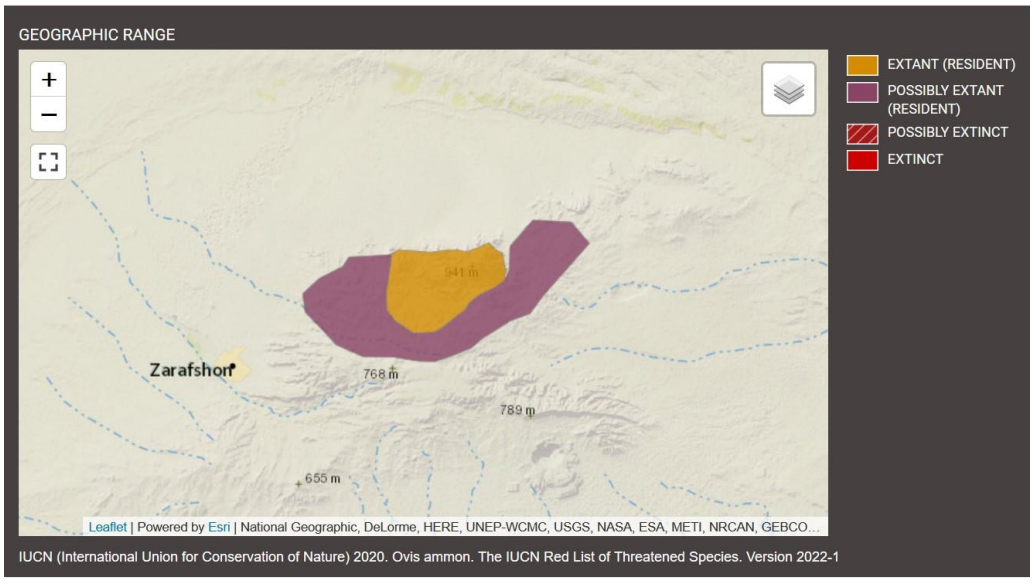
6. Impacts on other species of flora and fauna

All four wind project sites are located in habitats of vulnerable, endangered or critically endangered species, according to the International Union for the Conservation of Nature (IUCN) Red List of Threatened Species[48] and the Red Book: Republic of Uzbekistan (2019).[49] Critical habitat requirements are triggered for some of those, and many more are considered priority biodiversity features. We consider that the projects would have significant, adverse and irreversible impacts on at least some of these critical habitats and priority biodiversity features.

Zarafshon wind project

The critical habitat assessment report (Appendix 6-2 of the ESIA) considers 11 bird species, five mammal species, three reptile species, six invertebrates and five plants as priority biodiversity features. Two species of plants trigger critical habitat requirements.

The Tamdytau mountains protect the remaining population of Severtzov's argali sheep (Ovis ammon severtzovi, near threatened)[50] in the Kyzylkum desert. This population is very threatened – it is the easternmost population of the species and is completely isolated. According to the IUCN Red List map, argali sheep are extant around Mount Aktau and possibly in the surrounding area, including part of the project site. No specific studies on the species were done during the ESIA process, and it is only mentioned as 'confirmed in the surroundings' on page 209 of the ESIA.



Map 8. Easternmost part of the global geographical range of argali sheep. Source: IUCN, 2020.

[48] The IUCN Red List of Threatened Species, accessed 28 November 2022.

[49] Red Book: Republic of Uzbekistan (2019), *Save Manul*, 13 March 2021.

[50] R. Reading, S. Michel, and S. Amgalanbaatar, Ovis ammon, *The IUCN Red List of Threatened Species 2020*, 13 March 2020.

There is evidence of goitered gazelles (*Gazella subgutturosa*, vulnerable)[51] in the Tamdytau mountains. Gazelles often feed in the project area,[52] but the population was not counted and the impacts of the project on it were not quantified. Greater automobile accessibility to Mount Aktau when roads for the Zarafshon Wind project are built and disturbances during construction and maintenance of the turbines would probably affect both the gazelle and the argali populations in the long term, especially if no protected area is declared.

In June 2022, we found 11 steppe tortoises (Testudo horsfieldii, globally vulnerable[53]) on 4 kilometres of dirt road on the plateau, 10 of which had been killed by vehicles. For the construction and maintenance of the turbines and the IdentiFlight towers, vehicles will be moving on the plateau much more intensely and in many more areas than now during the project life cycle. The risk of increased mortality of tortoises and other nationally protected reptiles by vehicles was not assessed. Only the loss of suitable reptile habitat and the impacts of the construction of the turbines was assessed. The IFC responded to Bankwatch that 'any fatality risk to the Steppe Tortoise should be further reduced by standard good practice E&S [environmental and social] protocols', but this requires conducting a risk assessment in the first place.

Tortoises and ground squirrel killed on a dirt road at Zarafshon project site.
Photo: CEE Bankwatch Network, June 2022.

Bash wind project

The ESIA report considers eight species of bats, goitered gazelles and steppe tortoises to be priority biodiversity features. Additionally, the IUCN critically endangered southern even-fingered gecko (*Alsophylax laevis*) triggers critical habitat requirements. According to part B of the appendices, three plant species also trigger critical habitat requirements (*Acanthophyllum cyrtostegium* Vved., *Calligonum zakirovii* (Khalk.) Czerep. and *Ferula kyzylkumica* Korovin). The ESIA for the Bash to Karakul overhead transmission line (page 556) considers two species of bats, the steppe tortoise and the plant *Calligonum zakirovii* to be priority biodiversity features. The impacts on bats were not quantified and cannot be mitigated if the turbines closest to the lake are not moved

[51] IUCN SSC Antelope Specialist Group, Gazella subgutturosa, *The IUCN Red List of Threatened Species 2017*, 8 August 2016.

[52] N. Marmazinskaya, M. Gritsina M. Mitropolsky, R. Murzakhanov and J. Wunderlich, Rare ungulates of the Central, Southern Ustyurt and Sarykamysh depression: current state // Modern problems of conservation of rare, endangered and poorly studied animals of Uzbekistan, (Tashkent, 2016): 118-127.

[53] Tortoise & Freshwater Turtle Specialist Group, Testudo horsfieldii, *The IUCN Red List of Threatened Species 1996*, 1 August 1996.

away. No alternative locations for the project were assessed to avoid impacts on critical habitats and priority biodiversity features.

Diverse habitats with endemic plant species at the Bash wind project site.
Photo: CEE Bankwatch Network, June 2022.

Dzhankeldy wind project

The ESIA report (page 223) considers six species of bats, goitered gazelles, corsac foxes, sand cats, steppe polecates, Brandt's hedgehogs, steppe tortoises, Caspian monitors, desert sand boas and the plant *Calligonum zakirovii* to be priority biodiversity features. Additionally, the IUCN critically endangered southern even-fingered gecko (*Alsophylax laevis*) triggers critical habitat requirements. The ESIA for the Dzhankeldy to Bash overhead transmission line (page 518) considers two species of bats, goitered gazelles, steppe tortoises and the plant *Calligonum zakirovii* to be priority biodiversity features, while the southern even-fingered gecko triggers critical habitat requirements.

The project area is one of the most important areas in the world for conserving the southern even-fingered gecko. An assessment of the population in Uzbekistan is needed, including the number of affected individuals. This quantification of the impacts is lacking and no alternative locations were assessed to avoid the effects on critical habitats and priority biodiversity features.

7. Insufficient mitigation measures

Buffer zones around nests of threatened birds

The most critical impacts of all wind projects in Uzbekistan are on nesting birds. All ESIA reports recommend some distance from nests of selected species, but the raptor nest surveys for the Zarafshon, Bash and Dzhankeldy projects were not finalised prior to the project approval by the lenders. As of the time when this briefing was written, those studies had not been published. Additionally, the recommended buffers around nests were not based on scientific studies on the ground or good international practices as required by the lenders' policies. These minimal buffers seem to be chosen without considering the key species' core areas, and as such would not achieve conservation objectives. On page 147 of the Zarafshon ESIA, three birds' nests (those of the cinereous vulture, golden eagle and saker falcon) were described as being approximately 500 metres from the proposed turbines. Later, 500 metres was the buffer chosen for the Zarafshon project, 750 metres for the Bash project and 750 metres 'where possible' for the Dzhankeldy project.

Scientific articles and national standards recommend excluding the entire core zone of threatened species. For example, the government of Catalonia in Spain, in its criteria for making renewable energies compatible with the conservation of golden and Bonelli's eagles (2022),[54] prohibits wind projects in nesting areas (1 kilometre from occupied nests or nests abandoned after 1973), core areas of each pair and protected areas important for the species and dispersal of young birds. The different areas should be identified by radio-tracking each pair for at least one year, followed by a GIS/statistical analysis (fixed-kernel analysis).

When detailed information is lacking, the precautionary principle should be applied – buffer zones should extend to several kilometres from nests. Some studies in Greece have recommended buffers of up to 40 kilometres from nests of cinereous vultures, and in Spain they should be up to 15 kilometres from the nests of Egyptian vultures. In the United States, the U.S. Fish and Wildlife Service recommends that no wind turbines should be constructed within 2 miles (3.2 kilometres) of occupied golden eagle nests and within 800 metres of unoccupied (historical) nests.[55] In addition, the operation of all turbines located between 800 and 1,600 metres from any unoccupied nest should be curtailed each year from 15 January until 1 May (in case the eagles return).

Additional buffers should be chosen for other species and some geographical features. The U.S. Fish and Wildlife Service also recommends a minimum setback distance (buffer) equal to the greatest height of the largest wind turbine model used to build the wind energy project to be applied for topographic features such as ridgelines, cliff edges, mesa edges and buttes. This was not planned for any of the three projects in Uzbekistan. In the case of Bash, this is especially critical for water-related birds that fly to and from the lake,

[54] General Directorate of Environmental Policies and the Natural Environment, Department of Climate Action, Food and Rural Agenda, Criteris per compatibilitzar les energies renovables amb la conservació de l'àliga cuabarrada i de l'àliga daurada (juliol 2022), *Department of Climate Action, Food and Rural Agenda*, July 2022.

[55] U.S. Fish and Wildlife Service (USFWS), Region 6, Wildlife Buffer Recommendations for Wind Energy Projects, *U.S. Fish and Wildlife Service*, 31 March 2021.

including very sensitive species like night migrants, white-tailed sea eagles and flamingos, so the buffer from cliff edges (the IBA border) should be several kilometres.

The wind projects in Uzbekistan are located in desert habitats where food is scarce and the bird core areas are huge. This means that losing even one pair of threatened birds could have fatal consequences for the national population. Before the start of construction, project promoters need to undertake the following:

- Take the bird nest surveys conducted in 2022 into account when planning the final design of the wind farms;
- Carry out 12-month satellite telemetry studies of core areas of all pairs of birds that trigger critical habitat requirements or are considered priority biodiversity features nesting within 3 kilometres of proposed turbines;
- Until the results of the telemetry are finalised, adopt a buffer of 3 kilometres around all nests where no activities will be carried out;
- Adopt buffers of 200 metres from all ridgelines and cliff edges (the maximum height of the turbines is between 172.5 and 185 metres);
- Adopt a buffer of 3 kilometres from the Ayakaghytma lake IBA.

In its response to Bankwatch, the IFC refers to government authorities, as well as conservation and academic organisations, as responsible for identifying the core zones, but not the private clients. However, it is the responsibility of the IFC and its client to ensure compliance of the project with the performance requirements, filling the gaps in national regulations and the required studies.

Shutdown on demand (SOD)

Shutdown on demand involves halting the operation of specific turbines if any individual priority species or a significant flock of non-priority species flies within a buffer distance of wind turbines and is on a flight path that would bring the birds into proximity of the turbine blades.

It is assumed that this measure will solve the possible significant impacts on threatened birds for all of the projects. In a response to Bankwatch from 17 August 2022, the EBRD wrote:

> All the Projects will implement [a] state-of-the art shutdown-on-demand system (SOD), IdentiFlight, to avoid bird collisions. IdentiFlight is viewed as a leading SOD system, with better performance than, for instance, observer-led, radar or camera-based systems, and [has] proved its efficiency on a number of challenging wind projects in [the] US, Australia etc. It is the first time that such [a] system will be developed in Central Asia, and it showcases developers' and [the EBRD's] commitment to the protection of biodiversity.

For the Zarafshon project, two scenarios were assessed to cover all the turbines: observer-led shutdown and technology-led shutdown. The cost of the first scenario was estimated at USD 18 million for the 25-year lifespan of the project and included 60 survey staff. The costs of the second scenario were estimated at USD 17 million, foreseeing the installation and maintenance of 74 IdentiFlight units and only one experienced ornithologist during the 25-year lifespan (and one to three additional ornithologists during the first three years). The second option was chosen.

Bash and Dzhankeldy's ESIA studies did not initially include a detailed SOD framework, but were amended after August 2022. Thus, Dzhankeldy will have only six turbines, those which are within 1 kilometre of known nest locations, with an IdentiFlight SOD system. According to the amendments, the Bash project will implement a site-wide SOD system (through the use of Identiflight) in accordance with a Collision Risk Management Plan (CRMP). The threshold for acceptable levels of annual losses were calculated in the CRMPs of both projects, but as of November 2022 those plans are not publicly available.

Although we understand that SOD and, more specifically, IdentiFlight could decrease bird mortality, the proposed measure is insufficient for the following reasons:

- None of the proposed SOD options work during the night, leaving bats and birds that fly during the night unprotected against collision. This is especially problematic for the Bash project, which is located close to a lake where many of the protected birds are night migrants.

- IdentiFlight units have limitations when birds come from beneath and when nests are too close to turbines. According to a study by the Swiss Ornithological Society which tested IdentiFlight, there is evidence that strong flight activity of the target species in an area increases the risk that an IdentiFlight system will make errors during detection (classification, composition of flight paths).[56] In the same study, it is written that 'strong flight activity can be expected, for example, in the vicinity of breeding grounds, in places with an attractive food supply, or in places where migrating individuals could concentrate due to the terrain'.

- Research showing the effectiveness of IdentiFlight has not been carried out in circumstances similar to the ones in Zarafshon. In Wyoming (the United States), the system was tested only with golden eagles.[57] In Tasmania (Australia), the system has been tested only with Tasmanian wedge-tailed eagles. At Zarafshon, there are 11 target species (priority biodiversity features or those in critical habitats), at Bash 13 and Dzhankeldy 12.

- For some species, namely the globally endangered saker falcon (*Falco cherrug*), the biggest problem is not colliding with turbines but the abandonment of nests, which SOD cannot mitigate. In Romania, the 600-MW Fântânele-Cogealac wind farm caused at least one pair of saker falcons to disappear. In

[56] Janine Aschwanden and Felix Liechti, *Testing of the automatic bird detection system Identiflight on the WindForS test field as part of nature conservation research (NatForWINSENT)*, *Swiss Ornithological Institute, Sempach*, 2020.

[57] Christopher J.W. McClure, Brian W. Rolek, Leah Dunn, Jennifer D. McCabe, Luke Martinson and Todd Katzner, 'Eagle fatalities are reduced by automated curtailment of wind turbines', *Journal of Applied Ecology* 58 (2021):446–452.

southern Italy, wind farm construction is one of the reasons for the habitat change and population decline of the similar lanner falcon (*Falco biarmicus*), and some fatalities have also been reported.[58]

- The proposed IdentiFlight system poses additional risks that have not been assessed: all units (74 in the case of Zarafshon) will need additional roads, electricity, and fibre-optic cables. In the desert, where there are no trees, the units will be used by raptors to perch and survey the terrain (with unpredictable consequences for the performance of the system). And most importantly, all units will need year-round maintenance, which will cause additional human disturbance close to nests.

As discussed in the article about the use of the IdentiFlight system at wind turbines in Wyoming: 'automated curtailment at the treatment site reduced but did not eliminate the risk of collision'. Even at the Cattle Hill wind farm in Australia, which is given as the best example of the use of the system, two eagle mortalities occurred between July 2021 and June 2022.[59] Over the lifespan of the wind projects in Uzbekistan (at least 25 years), the cumulative impacts on birds could be significant, especially for globally endangered, vulnerable, and near threatened species. As such, this tool is secondary in the mitigation hierarchy to more effective options such as avoidance of high-risk areas. Even more, automated curtailment should not completely substitute experienced ornithologists and local people who are also needed for carcass removal, monitoring, and conservation of birds, as well as curtailment when IdentiFlight does not work. Hiring local people would also increase the social benefits of the project.

Although the IFC recognised (in its November 2022 response to Bankwatch) the risks of fatalities of priority species and committed to exploring a biodiversity offset, this might not be enough to stop biodiversity loss. [60]

Livestock management

Several thousand sheep and goats and a few horses, cows and dromedaries graze the project areas. The cumulative impacts of wind projects on livestock grazing are complex. Livestock compete with wild animals for food, and the wind farms' construction and operation will also disturb wild ungulates (argali sheep and gazelles). Livestock and wild animal carcasses are food for the four species of vultures that breed in or next to the project sites: Egyptian, cinereous, bearded and Eurasian griffons, as well as other raptors.

These birds follow the herds even when there are no dead animals, so if livestock grazes close to the wind turbines, there is a considerable risk of collisions. During a four-hour transect at Zarafshon, we found three livestock carcasses. It is impossible to discover all the carcasses of livestock or wild animals on time (before the vultures arrive), as the project areas are vast and the terrain is difficult to access. This is especially problematic, as the technology-led SOD scenario chosen for the projects would leave less personnel to spot potential problems.

[58] Richard T. Watson, 'Raptor Interactions With Wind Energy: Case Studies From Around the World', *Journal of Raptor Research* 52, no. 1 (2018): 1-18.

[59] Goldwind Australia, *Cattle Hill Wind Farm Annual Environmental Review 2022*, *Cattle Hill Wind Farm*, October 2022.

[60] Friends of the Earth US, Fool's Paradise: How Biodiversity Offsets Don't Stop Biodiversity Loss, *Friends of the Earth*, 2021.

A livestock management plan was developed for the Zarafshan project, but as of November 2022, plans for the Bash and Dzhankeldy projects are not publicly available. Improving livestock health is a good measure but is not sufficient on its own. At the same time, we do not recommend reducing livestock without sufficient studies, as that could lead to the starvation of certain species. The best option is to optimise the turbines' locations to avoid both the core areas of threatened birds and the best areas for livestock grazing. This would also have a positive social impact. Studies on how vultures use carcasses are also needed before making general decisions, as even one carcass close to a turbine could lead to the deaths of tens of vultures.

8. Missed opportunities for local communities

Based on project documentation and the meetings of Bankwatch with local communities, the key social concerns of the residents in the project impact areas are: lack of job opportunities; low level of education compared to job requirements; lack of public transport; gender inequality (high demands on women's work schedules, preference for male workers over female ones); low entrepreneurship because of the limited market and lack of infrastructure; lack of centralised gas supply, heating, waste management or sewage systems; water shortages and the need to import water from other districts; and electricity shortages due to the poor quality distribution network.

However, the design of the reviewed projects suggests a limited scope to meet the needs of the local communities. For example, the energy produced by the wind power plants will be provided to the grid with limited opportunities to improve the local energy supply. At the same time, studies show that women in Uzbekistan[61] are the most affected by energy scarcity, as they primarily rely on labour-saving appliances to perform traditional household duties. Moreover, female-headed households have a higher energy burden because they spend more of their income on energy, usually at the cost of social and health-related expenses.

Expected employment during the operation phase of the wind projects is minimal (up to 50 people, mainly highly skilled workers), which will not contribute to creating long-term job opportunities for local people, especially for women. The female employment rate remains 28 per cent lower than that of men in Uzbekistan, and women have more difficulty finding a job than men.[62] The wind power projects suggest employment opportunities mainly at the construction stage (up to 1,000 in total, with 50 per cent of employed people being locals). This phase lasts one to two years on average, with opportunities mainly for male workers. The share of women employed in the construction and logistics sectors in Uzbekistan is only around 10 per cent, which also reflects education opportunities.[63]

The wind power projects will mainly be constructed in remote rural areas where agriculture and farming form the basis of the local economy, with minimal goods and services to provide (i.e. construction materials,

[61] International Bank for Reconstruction and Development / The World Bank, *Energy vulnerability in female-headed households. Findings from the Listening to Citizens of Uzbekistan Survey*, *The World Bank*, 2019.

[62] William Seitz and Sevilya Murodova, 'Examining the scale of gender discrimination in hiring practices in Uzbekistan', *World Bank Blogs*, 7 March 2022.

[63] Mansour Omeira (ILO international consultant), supported by Jasmina Papa and Azizkhon Khankhodjaev (ILO), *Women and the World of Work in Uzbekistan Towards Gender Equality and Decent Work for All*, *International Labour Organization,* December 2020.

manufacturing services, etc.). This means that income from the project's implementation will likely leave the local economy.

Providing local communities with decentralised renewable energy solutions (i.e. wind turbines, solar photovoltaics, etc.) may ensure access to affordable and clean energy and incentivise economic and social development. Community wind and solar projects can be used by schools, hospitals, businesses and farms to ensure energy sufficiency and independence. Thus, Shamol Zarafshan Energy FE LLC (Masdar), which operates the Zarafshon wind project committed to provide solar power lighting at herder shelters.

Moreover, experience from other countries suggests[64] the following potential benefits for local communities from wind power projects, which apparently were not thoroughly considered by the developers in Uzbekistan and the multilateral development banks investing in them:

- Transparently and participatory governed community funds to support local initiatives.
- Provisions by the developers for improvements to local community facilities, environmental improvements, visitor facilities, school and educational support, etc.
- Ownership of shares in the project by local people, either through their own investment or through a profit-sharing or part-ownership scheme designed to tie community benefits directly to the project's performance.
- Local contracting and associated local employment during construction and operation.

Shamol Zarafshan Energy FE LLC (Masdar) confirmed that it has allocated USD 980,000 to the Community Development Plan to address the needs of the rural communities around the project.

Unfortunately, none of the lenders provided any feedback on the lack of social benefits in the wind power projects in Uzbekistan. These financial institutions' performance requirements aim to prevent any harm from the project implementation, and as part of this, it is essential to ensure project benefits to local communities.

9. Recommendations

1. The government of Uzbekistan should develop an SEA of the relevant strategies for the development of the renewable energy sector, including a transboundary assessment in line with the Espoo Convention. This should become the basis for making decisions on land allocation. Uzbekistan should adopt a law on SEAs in order to do this.
2. Comparative assessment of alternative locations with consideration of environmental and social risks should be mandatory for every renewable energy project in Uzbekistan and performed prior to the final decision on land acquisition.

[64] Centre for Sustainable Energy with Garrad Hassan & Partners Ltd, Peter Capener & Bond Pearce LLP, *Delivering community benefits from wind energy development: A Toolkit*, *Centre for Sustainable Energy*, July 2009.

3. Public and private companies should provide sufficient and timely disclosed information on the proposed projects to ensure the cumulative impact assessment of renewable energy projects in Uzbekistan. Final decisions on each project's design, including scale and location, should be made according to the significance of cumulative impacts.

4. Renewable energy projects in Uzbekistan should avoid making any impact on the conservation objectives and integrity of the protected areas, priority biodiversity features and critical habitats. For every such project, an assessment of impacts on established and proposed protected areas should be conducted and considered prior to making a final decision on the project's design and location.

5. Multilateral development banks must encourage the government of Uzbekistan to finalise the establishment of the proposed protected areas within the scientifically justified borders for the Aktau-Tamdy state reserve, Kuldzhuktau sanctuary and Sultanuwais Ridge national park.

6. Wind turbines should be moved away from core areas of the most threatened species of birds, including saker falcons, Egyptian, cinereous and bearded vultures, steppe eagles and MacQueen's bustards. Until core areas are defined in scientific studies, the precautionary principle should be applied and no turbines should be built closer than 3 kilometres to active or recent nests of these species. The design of the Zarafshon, Bash, Dzhankeldy and Karakalpakstan wind power projects should be adjusted to ensure sufficient buffer zones. The 34 turbines of the Bash project closest to the Ayakaghytma Lake important bird area should be moved two kilometres away from its border.

7. Wind project design should be defined by comprehensive and updated information on baseline conditions and potential risks, including long-term surveys on bird nesting, migration and wintering. Uzbekistan should contribute to the soaring bird sensitivity mapping tool developed by BirdLife International and apply it when making decisions on where projects should be located.

8. Additional studies on the potential collision of houbaras with transmission lines (for Bash and Dzhankeldy) and on the use of carcasses by vultures (for all projects) should be conducted prior to construction. Livestock management plans should be developed and disclosed as a part of environmental and social due diligence to ensure the project's design reflects unmitigated risks.

9. Avoidance of the impact on biodiversity through sufficient buffer zones and a reduced number of wind turbines should be prioritised, while proposed technological mitigation measures should be supplementary. Mitigation measures proposed for wind power projects to decrease birds' and bats' death due to collisions should consider the specifics of the environment in Uzbekistan.

10. An effective system of environmental monitoring capable of evaluating impacts on birds and bats should be developed, considering the extent of vast and scarcely accessible areas in Uzbekistan. Project operators should allocate sufficient budget (at least one per cent of the project's overall cost) for monitoring purposes.

11. Multilateral development banks and their clients should ensure that local communities – especially local women – benefit from renewable energy projects in Uzbekistan by ensuring that they get priority access to clean and affordable energy, providing long-term employment opportunities and developing social infrastructure.