AECOM Environment

Prepared for:
Enerjisa Enerji Üretim A.S.
İstanbul

Prepared by:
AECOM
Turkey
Report No: TR-R457-01-00
5 September 2011

Environmental and Social Action Plan (ESAP) for Balıkesir-1 Wind Farm in Balıkesir, Turkey

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Neslihan AYVAZ, Environmental Engineer, BS
Ahmet ÇELİK, Environmental Engineer, BS

_____
Prepared by

Gürkan KUNTASAL, Chemical Engineer, BS, MS

_____
Reviewed by

AECOM
Ahmet Rasim Sok. No:18/3
Çankaya 06550 Ankara Turkey
T: +90-312-442-9863
F: +90-312-442-9864
www.aecom.com

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List of Acronyms

EBRD	European Bank for Reconstruction and Development
EIA	Environmental Impact Assessment
EMRA	Energy Market Regulatory Authority
ESAP	Environmental and Social Action Plan
NTS	Non-technical Summary
PR	Performance Requirement
SEP	Stakeholder Engagement Plan

1.0 Introduction

1.1 Purpose and Scope of the ESAP

This Environmental and Social Action Plan (ESAP) for Balıkesir-1 Wind Farm Project (Balıkesir-1 WFP) (the Project) has been prepared in order to meet the requirements of EBRD.

In accordance with the EBRD's Environmental and Social Policy (2008), the Project has been screened as a Category A project, requiring the development of an ESAP in addition to the other technical documents. EBRD requires preparation of an ESAP as required by Performance Requirement (PR) 1 of its Environmental and Social Policy.

The aim of this ESAP is to determine the implementation program of mitigation measures and actions associated with the potential environmental and social impacts, both adverse and beneficial, of the project. In order to ensure this, all stages of the project including construction, operation and decommissioning phases are considered in accordance with the requirements of EBRD.

This Project must comply with both Turkish and the EU legislation as required by EBRD. Therefore, the ESAP includes all mitigation measures determined in the existing environmental impact report and additional actions required by EBRD that have not already been identified, e.g. actions recommended by IPPC's Best Available Techniques.

This ESAP sets out the environmental and social impacts of the project and associated measures to avoid, or where avoidance is not possible, mitigate the adverse on environment and communities. The ESAP also addresses environmental benefits, legislative requirement, responsibility, timetable and evaluation criteria for successful implementation of these measures.

1.2 Background of the Project

Enerjisa Enerji Üretim A.Ş. (Enerjisa) proposes to develop Balıkesir-1 Wind Farm Project (the Project) with an installed capacity of 142.5 MW in Balıkesir Province of Turkey. The project will annually generate 549.2 GWh of electrical energy through 52 wind turbines (General Electric 2.75 – 103 wind turbine).

The electricity will be transmitted through the Poyraz WFP - Balıkesir Transformer Station II connection as approved by Turkish Electricity Transmission Co. (TEIAS) with an approximately 4.5 km long over head energy transmission line (154/kV).

Enerjisa has been granted by the Turkish Energy Market Regulatory Authority (*EMRA) a* 49-year Generation License (EU/1167-6/839, dated April 18, 2007) for the proposed project under the provisions of Law No. 4628 governing the electricity market in the Republic of Turkey.

In accordance with the Environmental Impact Assessment (EIA) Regulation published Official Gazette No. 26939 and dated July 7, 2008, a Project Description Report (PDR) (a preliminary EIA report) is required for the projects included in the Annex II of this regulation. Since this project is included in the Annex II of the regulation, a PDR was prepared by a local consulting firm and submitted to the Balıkesir Provincial Directorate of Environment and Forestry. The project secured "Environmental Impact Assessment not Required" decision on November 29, 2007, which was a development consent and enables the project to secure other permits required by the relevant Turkish regulations.

Enerjisa plans to apply for a loan from the EBRD. Enerjisa has contracted with AECOM to prepare the supplementary documents according to the EBRD requirements. Review of the environmental reports report by AECOM pointed out the need for preparation of an Environmental and Social Action Plan (ESAP) as required by the EBRD for disclosure purpose.

1.3 Implementation and Monitoring of the ESAP

Organizational Capacity

The Project Owner (Operator) will establish and maintain an organizational structure and strengthen its capability (i.e. budget or professional staff) in order to implement mitigation measures and monitoring activities effectively. This will include the followings:

- Specific personnel on site or at the administrative level will be designated. Their responsibilities will be well defined.
- Sufficient human and financial resources will be provided to achieve effective and continuous social and environmental performance.
- The Operator will assess the capability of the designated personnel and ensure they are adequately qualified. If necessary the personnel will be trained so that they have the knowledge and skills necessary to perform their work.

For the construction phase of the Project, the personnel to implement the ESAP requirements will be appointed by the Owner. The Project Owner will be responsible for following up the ESAP requirements during the operation phase. Therefore, there will be designated personnel in the organizational structure of the Operator who will be responsible for implementing ESAP requirements. These personnel will also be responsible for coordination with the Environmental Consultant to be hired by the Operator for monitoring studies which is also explained in the following sections. The contractor management, which will be needed for the construction phase, is presented below.

Managing Contractors

Although it is the Operator's responsibility to implement this ESAP, many contractors and subcontractors will be working on site during the construction phase. Therefore, the Operator will ensure that all contractors are fully aware of this ESAP's requirements and meet the requirements set out in this ESAP. For this reason, followings will be carried out for an effective contractor management:

- Environmental and social risks associated with contracts will be assessed.
- Tender documents will include relevant PRs and ESAP requirements and capable contractors will be hired to meet the requirements.
- Contractors will be ensured to have knowledge and skills to perform their tasks in accordance with the PRs and ESAP requirements.
- Contractors will be monitored for the compliance with the requirements.
- Subcontractors of the contractors will be required to have similar arrangements.

Performance Monitoring

The Contractor/Operator will establish procedures to monitor the implementation of this ESAP. Since the Project is a Category A project, the Contractor/Operator will be required to hire qualified and experienced specialists to perform periodic monitoring throughout the life of the EBRD's involvement with the project. Monitoring results will be documented to the EBRD and based on these results the Contractor/Operator will carry out necessary corrective and preventive actions. It may be necessary to revise the original ESAP; therefore amended ESAP and/or offset program will be submitted to the Bank for approval. As EBRD's Environmental and Social Policy (2008) requires, the Contractor/Operator will visit the project site by the EBRD's environmental or social specialists, or consultants acting on the EBRD's behalf.

The Contractor will hire an Environmental Consultant to monitor the requirements of the ESAP during the construction of the project. The Consultant will present the monitoring results and mitigation measures for the findings/non-compliance issues observed on the site to the Contractor. The Contractor will keep a copy of the environmental monitoring reports.

2.0 Environmental and Social Action Plans

Table 2-1 ESAP for the Construction Phase

No	Issue	Potential Impact	Action (Mitigation Measure)	Environmental Risks Liability/ Benefits	Legislative requirement/ EBRD PRs/ Best practice	Investment Needs /Resources/ Responsibility	Timetable	Target and Evaluation Criteria For Successful Implementation
1.0	**Environmental Impacts during Construction Phase**							
1.1	**Air Quality**	Dust generation from excavation activities	- Where possible, the contractor will select the equipment design to minimize the dust emissions. - Activities that produce significant dust emissions will be monitored during periods of high winds and dust control measures implemented as appropriate. - Stockpiles of soil and similar materials will be carefully managed to minimize the risk of windblown dust, e.g. water spray dampening soils and spoil and during delivery and dumping of sand and gravel during periods of dry weather. - Loading and unloading of material that could generate dust will be done without throwing into the air. - Where possible, drop heights for material transfer activities, e.g. unloading of friable materials, will be minimized and carefully managed. - On-site and access roads will be well maintained through mechanical means (sweeping or vacuuming) or spraying with water. If dust cannot be prevented despite spraying, windbreak panels will be used. - Vehicle speeds on un-surfaced roads will be limited to 30 km/h.	Avoidance of excessive dust generation affecting human and flora/fauna elements in the vicinity of the construction site.	EU Directive 2008/50/EC Turkish Industrial Air Pollution Control Regulation Best Practice	Project budget / Contractor	During the construction period	Site Observation Construction Monitoring Reports to EBRD (Dust Emission Measurements if required)

No	Issue	Potential Impact	Action (Mitigation Measure)	Environmental Risks Liability/ Benefits	Legislative requirement/ EBRD PRs/ Best practice	Investment Needs /Resources/ Responsibility	Timetable	Target and Evaluation Criteria For Successful Implementation
			- Lorries used for the transportation of friable construction materials and spoil off-site will be covered/sheeted. - Dust concentration in the site and closest sensitive receptor will be monitored if required.					
		Gaseous pollutant emission from construction machines	- Best available control technology will be adopted to reduce emissions from fuel storage, combustion emissions from engines and any other temporary equipment. - Engines will not be left running unnecessarily. Engines will be switched off when not in use. - Regular maintenance of vehicles will be undertaken to ensure that vehicles are safe and that emissions are minimized. - All vehicles will be regularly maintained so that their exhaust emissions do not cause nuisance to workers or local people.	Lowering primary air pollutants affecting human and flora/fauna elements in the vicinity of the construction site. Opportunity to monitor GHG emissions affecting air quality in the vicinity of the construction site.	EBRD PR 3 Best Practice	Project budget / Contractor	During the construction period	Site Observation
1.2	**Noise**	Noise generation from the construction vehicles and machines	- All construction vehicles will be maintained regularly so that their noise emissions do not cause nuisance to workers or local people. - Exhaust mufflers will be employed on engine-powered construction equipment and vehicles. - The use of vehicles during construction will be optimized as much as possible to reduce number of vehicles and thus reduce the potential for traffic noise. - All vehicles will be driven responsibly and below 30 km/h within the construction site. - The site personnel will be provided with proper personal protective equipments in	To minimize noise levels and prevent the disturbance resulting from noise.	EU Directive 2002/49/EC Turkish Regulation on Assessment and Management of Environmental Noise Best practice	Project budget / Contractor	During the construction period	Site Observation Construction Monitoring Reports to EBRD Monitoring of the noise levels at the nearest sensitive receptor and at the receptors close to the locations where the construction activities are conducted

No	Issue	Potential Impact	Action (Mitigation Measure)	Environmental Risks Liability/ Benefits	Legislative requirement/ EBRD PRs/ Best practice	Investment Needs /Resources/ Responsibility	Timetable	Target and Evaluation Criteria For Successful Implementation
			order not to expose to high noise levels that can be generated at the site. - Site personnel will be trained in the proper use and maintenance of tools and equipment, and the positioning of machinery on site to reduce noise emissions to neighboring communities. - All necessary actions will be taken to ensure that every settlement in the vicinity of the working area and noise susceptible features are identified, residents are informed about the project and working hours and those complaints due to noise are received. - Noise levels and vibration will be monitored and reported. A noise modeling assessment will be conducted prior to start of construction works.					(measurement of the noise levels at the receptors during the construction period in case of any complaints from the public and also at the nearest sensitive receptor)

No	Issue	Potential Impact	Action (Mitigation Measure)	Environmental Risks Liability/ Benefits	Legislative requirement/ EBRD PRs/ Best practice	Investment Needs /Resources/ Responsibility	Timetable	Target and Evaluation Criteria For Successful Implementation
1.3	**Landscaping & Erosion and Sedimentation**	Landslides and erosion on excavated soil surfaces.	- An Erosion and Sedimentation Control Plan will be prepared and the mitigation actions will be determined at the project site. - Vegetative top soil of the project site will be stripped prior to excavation works and will be stored in the construction site separately to be used in landscaping. The pile height will not exceed 2 m. - Drainage channels will be constructed in order to control runoff and prevent the agricultural lands in the project site around the turbine locations and the access roads. - Excavation works will be performed in a way to minimize landslides and surface erosion. - Construction management of excavations will avoid the generation of drainage pathways to underlying aquifers. - Slope stabilization and landscape works will be performed where excavation is carried out.	Avoidance of landslides and erosion. Protection of vegetative top soil.	Turkish Regulation on Control of Excavation Soil, Construction and Demolition Wastes Best Practice	Project budget / Contractor	During the construction period	Site Observation Construction Monitoring Reports to EBRD (Site observation for the risk of landslides and erosion control measures)

No	Issue	Potential Impact	Action (Mitigation Measure)	Environmental Risks Liability/ Benefits	Legislative requirement/ EBRD PRs/ Best practice	Investment Needs /Resources/ Responsibility	Timetable	Target and Evaluation Criteria For Successful Implementation
1.4	**Waste Management**	Wastewater	- Any wastewater discharge to the environment will be prohibited. - Sanitary (domestic) wastewater from the workers camp will be stored in sealed or impervious septic tanks. - The septic tanks will be made of leak proof material and the tank level will be checked periodically. - Wastewater generated during the construction phase will be transported and disposed periodically to relevant authority. The disposal records will be kept at the site.	Preventing the impact of wastewaters on soil, surface and groundwater quality	EU Directive 91/271/EEC Turkish Water Pollution Control Regulation EBRD PR 3	Project budget / Contractor	During the construction period	Construction Monitoring Reports to EBRD (keeping the disposal records on site)

No	Issue	Potential Impact	Action (Mitigation Measure)	Environmental Risks Liability/ Benefits	Legislative requirement/ EBRD PRs/ Best practice	Investment Needs /Resources/ Responsibility	Timetable	Target and Evaluation Criteria For Successful Implementation
1.4	**Waste Management**	Non-hazardous Solid Waste (organic and recyclable wastes)	- A Waste Management Plan will be developed in order to reduce the waste generation and to implement the waste reuse and recycle practices. - Wastes will be characterized according to the composition, source, types of wastes produced, generation rates, or according to local regulatory requirements. - Feasible waste prevention, reduction, reuse, recovery and recycling measures will be adopted. Waste materials will be treated and disposed of and all measures will be taken to avoid potential impacts to human health and the environment. - Solid wastes that could be recycled, like cement bags, metal scraps, tin cans, packing boxes and wooden crates, etc. will be separated and stored temporarily on site for eventual recycling process. - Solid wastes that are non-recyclable and non-hazardous will be collected and properly disposed of in a waste disposal site of relevant Municipality. - The paper, plastic and glass content in the wastes will be separated for recycling. - The non-recyclable solid wastes will be sorted and accumulated inside appropriate, leak proof, non-contaminating drums for eventual disposal at the site designated by the local Municipality. - The domestic waste will be collected in special trash bins onsite and made available for the local municipality collection trucks.	Waste minimization, resource conservation and effective waste management.	EU Directive 2008/98/EC Turkish Solid Wastes Control Regulation Turkish Regulation on General Principles of Waste Management Turkish Packaging Waste Control Regulation EBRD PR 3	Project budget / Contractor	During the construction period	Site Observation Construction Monitoring Reports to EBRD The disposal agreements with the licensed companies for all necessary type of wastes will be signed and the records will be kept on site. (The amount of waste generated, recycled and disposed)

No	Issue	Potential Impact	Action (Mitigation Measure)	Environmental Risks Liability/ Benefits	Legislative requirement/ EBRD PRs/ Best practice	Investment Needs /Resources/ Responsibility	Timetable	Target and Evaluation Criteria For Successful Implementation
1.4	**Waste Management**	Excavation soil	- The excavation, construction and demolition wastes will be reused where possible for refilling. In case they cannot be used they will be disposed of at the places approved by the Municipality or relevant authorities according to the Excavation, Construction and Demolition Waste Control Regulation.	Waste minimization, resource conservation and effective waste management.	EU Directive 2008/98/EC Turkish Regulation on Control of Excavation Soil, Construction and Demolition Wastes	Project budget / Contractor	During the construction period	Site Observation Construction Monitoring Reports to EBRD

No	Issue	Potential Impact	Action (Mitigation Measure)	Environmental Risks Liability/ Benefits	Legislative requirement/ EBRD PRs/ Best practice	Investment Needs /Resources/ Responsibility	Timetable	Target and Evaluation Criteria For Successful Implementation
1.4	**Waste Management**	Hazardous Wastes (Waste oil, waste batteries and accumulators, medical wastes, etc.)	- Hazardous wastes will be segregated from non-hazardous wastes and its management will focus on the prevention of harm to health, safety, and the environment. - "Hazardous waste" label will be placed on to the containers and this label will indicate the amount of stored waste as well as the storage time of the hazardous waste. Hazardous solid wastes generated during construction will be collected and stored in a concrete area with proper labeling. - Hazardous wastes will be stored in containers that are non-damaged, leak-proof, safe and appropriate for the international standards, on concrete place within the land of the facility. - Hazardous waste containers will be kept closed and wastes will be stored in a way that they will not go in chemical reactions. - The hazardous liquid wastes will be collected in metal or plastic drums and stored in an area with a concrete surface and a proper secondary containment to prevent potential spills and leakages reaching to soil or groundwater. - Transportation of the wastes will be done by the persons and entities that are licensed for this work and by the vehicles appropriate for the properties of the transported waste. The hazardous wastes will be sent to a licensed disposal facility.	To ensure proper disposal of hazardous wastes which to prevent the risk of soil, surface waters and groundwater contamination.	EU Directive 2008/98/EC Turkish Waste Oil Control Regulation Turkish Regulation for Control of the Tires Which Have Completed Their Life-Cycles Turkish Regulation on Control of Waste Batteries and Accumulators Turkish Hazardous Waste Control Regulation Turkish Medical Waste Control Regulation EBRD PR 3	Project budget / Contractor	During construction	Site Observation Construction Monitoring Reports to EBRD Amount of waste generated and transported (Waste Declaration Form and National Waste Transportation Forms)

No	Issue	Potential Impact	Action (Mitigation Measure)	Environmental Risks Liability/ Benefits	Legislative requirement/ EBRD PRs/ Best practice	Investment Needs /Resources/ Responsibility	Timetable	Target and Evaluation Criteria For Successful Implementation
1.5	**Hazardous Materials Handling**	Impacts on soil and groundwater as a result of spillage/leakage of the chemicals	- All chemical storage containers, including diesel fuel, and hazardous liquid waste drums/containers will be placed so as to minimize the risk of soil and groundwater contamination and water pollution. - All chemicals will be stored according to their compatibilities and reactivity. - All chemicals and fuel will be stored on improper areas (i.e. concrete) with proper secondary containments and drip trays during construction. - When necessary, spill kits, absorbent pads or materials, and absorbent sands will be provided near the chemical storage areas at all times. - Any spill from construction activities will be monitored and controlled; waste materials which are unsuitable for reuse on-site will be disposed of at an appropriately licensed waste disposal site.	To ensure proper handling of the chemicals to prevent the risk of soil, surface waters and groundwater contamination.	EU Directive EC 1907/2006 (REACH) Turkish Bylaw on the Measures to be taken at Work sites and Works Utilizing Flammable, Explosive, Hazardous and Detrimental Materials EBRD PR 3	Project budget / Contractor	During the construction period	Site Observation Construction Monitoring Reports to EBRD
1.6	**Ecology**	Impact on Terrestrial Flora and Fauna	- There are no sensitive or protected areas, threatened or endemic flora and fauna species within the project site. - Vegetative soil will be stored separately for future landscaping purposes where possible and stored near the switchyard area. All the soil stockpiles at the site will be controlled in terms of slope stabilization and runoff in order not to adversely impact the surrounding lands (i.e. agricultural areas). - Hunting of animals and collecting ground nests for resident birds will be prohibited. - All solid and liquid wastes during construction will be collected and disposed in the nearest disposal sites to decrease the	To ensure protection of the ecosystem.	EU Directive 92/43/EEC Decisions of Central Hunting Commission, Terrestrial Hunting Law numbered 4915. Bern Convention EBDR PR 6	Project budget / Contractor	Before / During the construction period	Site Observation Construction Monitoring Reports to EBRD

No	Issue	Potential Impact	Action (Mitigation Measure)	Environmental Risks Liability/ Benefits	Legislative requirement/ EBRD PRs/ Best practice	Investment Needs /Resources/ Responsibility	Timetable	Target and Evaluation Criteria For Successful Implementation
			impact on fauna - Turbines will be made in a tubular structure, which will deter birds from landing or perching on them. - Before the stripped material is removed from the area, a visual control will be made for the possibility that vertebrates such as tortoises, hedgehogs, lizards and snakes may enter these stripped materials. If any fauna element is found, it will be put into a cloth bag and transferred to a nearby habitat and released carefully. - Adjacent habitats will be protected from disturbance by the construction workforce, e.g. by fencing off of unused areas, warning signs and training of workers - Visual controls will be carried out before stripping and excavation works and the fauna elements inhabiting these areas will be removed by means of proper methods. - Measures stated in Article 6 and Article 7 of Bern Convention will be taken in order to protect the fauna species given in Appendix II and III of Bern Convention. - An ornithological study will be conducted to identify the population of the bird species, define the potential migration routes if there is any along the project site and related potential risks. - Off road driving will be avoided as much as possible.					

No	Issue	Potential Impact	Action (Mitigation Measure)	Environmental Risks Liability/ Benefits	Legislative requirement/ EBRD PRs/ Best practice	Investment Needs /Resources/ Responsibility	Timetable	Target and Evaluation Criteria For Successful Implementation
1.7	**Visual**	Visual Impact to the surrounding Environment	- All debris and wastes will be collected, stored, and transported in an orderly manner to prevent any adverse visual impact on the surrounding area. - Construction camp site will be compact, kept clean and well maintained. Building material at the camp will be well maintained and newly painted to match with the local environment. - Project equipment storage area will be maintained properly to prevent adverse visual impact. - Construction camp site and the equipment lay down area will be reinstated to original after the construction.	To ensure minimization of visual impacts	-	Project budget / Contractor	Before/ During the construction period	Site Observation Construction Monitoring Reports to EBRD

No	Issue	Potential Impact	Action (Mitigation Measure)	Environmental Risks Liability/ Benefits	Legislative requirement/ EBRD PRs/ Best practice	Investment Needs /Resources/ Responsibility	Timetable	Target and Evaluation Criteria For Successful Implementation
1.8	**Traffic**	Traffic Impact to the surrounding Environment	- Safety and traffic signs will be clearly placed near and around the project site on the road to the project site. - Scheduling of traffic will be undertaken to avoid the peak hours on the local road network wherever practicable. - Special loads will adhere to prescribed routes to be agreed with the appropriate authorities - these will be scheduled to avoid peak hours on local roads and published well in advance to minimize possible disruption. - Road safety training and adherence to speed limits will be stressed to all drivers. - Prescribed routes for construction traffic will be agreed with the appropriate authorities, particularly with respect to tanker and truck traffic and special loads (heavy and wide loads). - Entrance to the site will be clear and properly designed. - To protect the roads, trucks which will be used for transporting activities should have a gross weight within the axial permissible load.	To ensure effective traffic management and minimize health and safety risks for the public.	-	Project budget / Contractor	During the construction period	Site Observation Construction Monitoring Reports to EBRD
1.9	**Cultural and Archeological Resources**	Impact on Cultural and Archeological Resources	- Construction works will be monitored for archaeological remains. - If any archeological remains are discovered, as the national law requires, the project will cease excavation at this location and the local Department of Culture and Tourism will be informed immediately.	To ensure prevention of potential impact on cultural and archeological resources	-	Project budget / Contractor	During the construction period	Site Observation Construction Monitoring Reports to EBRD

No	Issue	Potential Impact	Action (Mitigation Measure)	Environmental Risks Liability/ Benefits	Legislative requirement/ EBRD PRs/ Best practice	Investment Needs /Resources/ Responsibility	Timetable	Target and Evaluation Criteria For Successful Implementation
2.0	**Social Impacts during Construction Phase**							
2.1	**Community Health and Safety**	Impact on local people due to traffic, hazardous material handling, noise and vibration.	- A grievance mechanism will be developed to receive and manage complaints from project affected people. - The transport of equipments, turbines, blades and materials will be undertaken in an appropriate manner. - Speed limits will be settled for all traffic routes in the project site. - Project vehicles and equipment will be well maintained and project related traffic will be requested to travel no faster than the speed limit. - Information boards about public safety hazards and emergency contact information will be available in the wind farm. - Clear signs, flagmen and signals will be used where necessary in the vicinity of the construction site. - At the construction site the start and end dates of construction and working periods as well as information with regard to permits obtained from metropolitan municipality and/or district/province municipalities have to be shown on a plate in public places with easy access to everybody. - The hazardous materials and wastes will be stored on site in a way that community exposure to these substances is prevented. - Legal limits for noise levels and vibration will be complied during construction activities.	To ensure effective social management and minimize health and safety risks for the public.	EBRD PR 4 Best Practice	Project budget / Contractor	During the construction period	Site Observation Construction Monitoring Reports to EBRD Complaints received during the construction

No	Issue	Potential Impact	Action (Mitigation Measure)	Environmental Risks Liability/ Benefits	Legislative requirement/ EBRD PRs/ Best practice	Investment Needs /Resources/ Responsibility	Timetable	Target and Evaluation Criteria For Successful Implementation
			- Driving through the villages will be avoided by the project vehicles as much as possible. If there are alternative routes, alternative routes will be used to avoid traffic in villages.					
2.2	**Occupational Health and Safety (OHS)**	Impact on health and safety of the project personnel	- Risk Analysis and Emergency Response Plans including fire, accidents and spills will be prepared for the construction phase of the project. However, general mitigation measures regarding occupational health and safety are: - Employees will be trained for the health and safety requirements. - The safety harness will be used to secure persons during ascent to and descent from the nacelle of the wind turbine generator system and when carrying out work in areas where there is a falling hazard. - Together with the safety harness, the traveling safety hook constitutes a safety device for ascent/descent via the ladder inside the tower. - All the precautions related with working at heights will be taken throughout the construction and operational phases of the proposed project in accordance with the IFC Guidelines and the local regulations. - Material Safety Data Sheets for all chemicals used at the plant will be available at site and in easy reach to concerned employees. - Proper and approved Personal Protective Equipment (PPE) will be provided to all employees handling chemicals and will be trained on their use and maintenance.	To minimize the health and safety risks for workers	Turkish Occupational Health and Safety Statue Turkish Health and Safety Regulation for Construction Works EBRD PR 2	Project budget / Contractor	During the construction period	Number of accidents and near-misses Construction Monitoring Reports to EBRD

No	Issue	Potential Impact	Action (Mitigation Measure)	Environmental Risks Liability/ Benefits	Legislative requirement/ EBRD PRs/ Best practice	Investment Needs /Resources/ Responsibility	Timetable	Target and Evaluation Criteria For Successful Implementation
			- Earmuffs and ear-plugs will be provided to the workers in all areas of a potential source of high noise. - Employees will be trained on the proper handling of chemicals and be informed of their hazards. - Key personnel will be trained in first aid and have a valid training certificate. - A first aid box will be located in the nacelle of the wind turbine system for the treatment of minor injuries. - The wind turbine generator system is provided with an emergency exit system consisting of an emergency descending device. The emergency exit consists of a hatch located at the back of the nacelle. - Heavy machinery that used in the construction activities will be provided with good rubber insulation for windows and doors to protect the drivers. - Two fire extinguishers will be available in the wind turbine generator system. One fire extinguisher will be mounted on the down tower assembly in the tower base, the other one on the top box in the nacelle. - Employees will be trained on the use of fire fighting systems and equipment. - The wind turbine will be equipped with lightning protection systems which have the task of diverting the lightning currents arising from lightning strikes and the energy associated with the lightning into the ground in a controlled manner. The turbine will be equipped with receptors, e.g. on the blades, that receive the lightning current and divert it					

No	Issue	Potential Impact	Action (Mitigation Measure)	Environmental Risks Liability/ Benefits	Legislative requirement/ EBRD PRs/ Best practice	Investment Needs /Resources/ Responsibility	Timetable	Target and Evaluation Criteria For Successful Implementation
			through predefined paths within the turbine to the ground.					
			OHS plans in accordance with Turkish OHS Regulation and relevant EBRD/IFC-World Bank/Industry best practices will be prepared before construction phase and these plans will be shared with EPC contractor. OHS management system will be established.	To minimize the health and safety risks for workers	Turkish Occupational Health and Safety Statue EBRD PR 2 IFC-World Bank Best practice	Project budget / Contractor	During the construction period	Number of accidents and near-misses Construction Monitoring Reports to EBRD
2.3	**Human Resources**	Impact on labor and working conditions	- Human resources policies will be maintained appropriate to the workforce. - All workers will receive documentation on their working conditions and terms of employment including their entitlement to wages, hours of work, overtime arrangements and overtime compensation, and any benefits. - Employment decisions will not be made on the basis of personal characteristics, such as gender, race, nationality, ethnic origin, religion or belief, disability, age or sexual orientation, unrelated to inherent job requirements.	To improve working conditions and develop good working relationships	Turkish Labor Law no: 4857 EBRD PR 2	Project budget / Contractor	During the construction period	Complaints received from the workers

Table 2-2 ESAP for the Operation Phase

No	Issue	Potential Impact	Action (Mitigation Measure)	Environmental Risks Liability/ Benefits	Legislative requirement/ EBRD PRs/ Best practice	Investment Needs /Resources/ Responsibility	Timetable	Target and Evaluation Criteria For Successful Implementation
1.0	**Environmental Impacts during Operation Phase**							
1.1	**Noise**	Noise resulting from the wind turbines	Noise mitigation measures will be incorporated into the design of the turbines, including: - The turbines with reduced noise operation system will be chosen in order to minimize noise emissions - The turbines are properly positioned and placed in terms of possible noise emissions. - The turbines are equipped with optional noise reduced power operation modes to accommodate noise restrictions. - Necessary noise reducing equipments and implementations will be provided (i.e. double wall windows and frames to the houses close to the turbines). - Monitoring of the environmental noise at the nearest sensitive receptors during operation phase (if required).	To minimize the adverse impact of noise on the local community	EU Directive 2002/49/EC IFC/WB Noise Level Guideline Turkish Regulation on Assessment and Management of Environmental Noise	Project & Operational budget / Operator	During the operation	Site observations and complaints from the receptors. Report to the EBRD.

No	Issue	Potential Impact	Action (Mitigation Measure)	Environmental Risks Liability/ Benefits	Legislative requirement/ EBRD PRs/ Best practice	Investment Needs /Resources/ Responsibility	Timetable	Target and Evaluation Criteria For Successful Implementation
1.2	**Waste Management**	Wastewater generation (domestic wastewaters)	- Any wastewater discharge to the environment will be prohibited. - Sanitary wastewater from the administrative building will be stored in sealed or impervious septic tanks. - The septic tanks will be leak proof and the level will be checked periodically. - Wastewater generated during the operation phase will be transported and disposed of periodically to relevant authority. The disposal reports will be kept on site.	Preventing the impact of wastewaters on surface and groundwater quality	EU Directive 91/271/EEC Turkish Water Pollution Control Regulation EBRD PR 3	Operational budget / Operator	During the operation	Keeping the disposal records on site.
		Non-hazardous solid waste generation (organic and recyclable wastes)	- A Waste Management Plan for the operation phase will be developed in order to reduce waste generation and implement waste reuse and recycle practices. - The wastes will be characterized according to composition, source, types of wastes produced, generation rates, or according to local regulatory requirements. - The domestic waste will be collected in special trash bins onsite and made available for the local municipality collection trucks. - Recyclable wastes such as paper, glass, metal and plastic will be collected separately and transported to a licensed recovery facility. - The non-recyclable solid wastes will be sorted and accumulated inside appropriate, leak proof, non-contaminating drums for eventual disposal at the site designated by the local Municipality.	Waste minimization, resource conservation and effective waste management.	EU Directive 2008/98/EC Turkish Solid Wastes Control Regulation Turkish Regulation on General Principles of Waste Management Turkish Packaging Waste Control Regulation EBRD PR 3	Operational budget / Operator	During the operation	Keeping the disposal records of recycled and disposed waste on site.

No	Issue	Potential Impact	Action (Mitigation Measure)	Environmental Risks Liability/ Benefits	Legislative requirement/ EBRD PRs/ Best practice	Investment Needs /Resources/ Responsibility	Timetable	Target and Evaluation Criteria For Successful Implementation
1.3	**Waste Management**	Hazardous Wastes (waste oil, waste batteries and accumulators, medical wastes)	- Waste oils resulting from maintenance works will be collected. These wastes will be removed from the project site in accordance with the Waste Oil Control Regulation. - Waste battery and accumulators will be collected separately from household wastes and will be delivered to the collection points to be established by enterprises engaged in the distribution and sales of battery products, or by municipalities within six months after they are generated. - "Hazardous waste" label will be placed on to the containers and this label will indicate the amount of stored waste as well as the storage time of the hazardous waste. Hazardous solid wastes generated during operation will be collected and stored in a concrete area with proper labeling. - Any hazardous waste will be collected in leak-proof containers and removed to a licensed disposal facility by licensed transporters. The hazardous wastes will be handled, stored, transported and disposed of according to the Turkish Hazardous Wastes Control Regulation, Waste Oils Control Regulation and Waste Batteries and Accumulators Control Regulation, and the IFC guidelines.	To ensure proper disposal of hazardous wastes which to prevent the risk of soil, surface waters and groundwater contamination.	EU Directive 2008/98/EC Turkish Waste Oil Control Regulation Turkish Regulation on Control of Waste Batteries and Accumulators Turkish Hazardous Waste Control Regulation Turkish Medical Waste Control Regulation EBRD PR 3	Operational budget / Operator	During the operation	Keeping the disposal records and National Waste Transportation Forms on site.
1.4	**Hazardous Materials Handling**	Impacts on soil and groundwater as a result of spillage/leakage of chemicals	- All chemical storage tanks and drums, including those containing fuel and oil as well as waste oil drums and containers will be placed on concrete areas with proper secondary containments. If necessary, absorbent materials will be purchased and placed near the chemical storage tanks. - Any leakage oil will be collected in the bottom part of the nacelle enclosure. The wind turbine generator system will also be equipped with a series of smaller oil collection systems for	To ensure proper handling of the chemicals to prevent the risk of soil, surface waters and groundwater contamination.	EU Directive EC 1907/2006 (REACH) Turkish Bylaw on the Measures to be taken at Work sites and Works Utilizing Flammable, Explosive, Hazardous and	Operational budget / Operator	During the operation	Visual inspection and keeping the shipment records on the site

No	Issue	Potential Impact	Action (Mitigation Measure)	Environmental Risks Liability/ Benefits	Legislative requirement/ EBRD PRs/ Best practice	Investment Needs /Resources/ Responsibility	Timetable	Target and Evaluation Criteria For Successful Implementation
			individual system components. - Any residues and leftover oil following maintenance work will be collected in leak-proof containers and removed to a recycling facility by licensed transporters. - Regular maintenance of the turbines will minimize the potential for fluid leaks. - Transformers will be provided with pits to retain 110% of the coolant capacity of the transformers. - The cooling oil for the transformers will not contain PCBs or any other carcinogenic type oils. - Waste oils will be temporarily stored, handled and disposed in separate tanks/containers according to the categories referred in the Waste Oil Control Regulation. - Waste oils will be collected inside the tanks/containers placed on an impermeable surface. Different tanks/containers will be used for waste oils of different categories. Waste oil temporary storage tanks/containers will be red and bear “Waste Oil” sign. - Emergency Response Plan and Oil Spill Contingency Plan will be prepared and implemented. - Waste oils will be transported by licensed transporters to the licensed processing and disposal facilities and National Transportation Form will be filled in the case of transporting the waste oil out of the facility and waste oil declaration form will be submitted to relevant authorities annually.		Detrimental Materials EBRD PR 3			

No	Issue	Potential Impact	Action (Mitigation Measure)	Environmental Risks Liability/ Benefits	Legislative requirement/ EBRD PRs/ Best practice	Investment Needs /Resources/ Responsibility	Timetable	Target and Evaluation Criteria For Successful Implementation
1.5	**Ecology**	Impact on Terrestrial Flora	- Vehicle movement will be restricted to the existing roads that connect the proposed project site with the surrounding areas. - Off road driving will be avoided.	To ensure protection of the ecosystem.	EBDR PR 6 Best Practice	Project budget / Operator	During operation	Site observation
1.6	**Ecology**	Impact on Fauna	- Hunting will be prohibited at and around project site by the workers. - Measures stated in Article 6 and Article 7 of Bern Convention will be taken in order to protect the fauna species given in Appendix II and III of Bern Convention. - Appropriate storm water management measures will be implemented to avoid creating small ponds which can attract birds and bats for feeding or nesting near the wind farm. - Low intense and blinking lights will be preferred obstruction lights in order to minimize the risk of avian collision. - Bird surveys will be conducted during the operation of the project during migration periods according to the results of the ornithological assessment before the operation of the Balikesir-1 WFP.	To ensure protection of the ecosystem.	EU Directive 92/43/EEC Decisions of Central Hunting Commission, Terrestrial Hunting Law numbered 4915. Bern Convention EBDR PR 6	Operational budget / Operator	During the operation	Site observation Commitments & Survey Targets defined in the Ornithological Assessment Report

No	Issue	Potential Impact	Action (Mitigation Measure)	Environmental Risks Liability/ Benefits	Legislative requirement/ EBRD PRs/ Best practice	Investment Needs /Resources/ Responsibility	Timetable	Target and Evaluation Criteria For Successful Implementation
1.7	**Visual**	Visual Impact to the surrounding Environment	- Anti-collision lighting and marking systems will be used on the blades in order to provide aviation safety. - Proper landscaping will be provided around the control and operations area. - Lettering, company insignia, advertising, or graphics on the turbines will be avoided. - Turbines will be painted a uniform color, typically matching the sky (white, light gray or pale blue)	To ensure minimization of visual impacts	-	Operational budget / Operator	During the operation	Site observation
1.8	**Traffic**	Traffic Impact to the surrounding Environment	- Road safety training and adherence to speed limits will be stressed to all drivers. - Safety and traffic signs will be clearly placed near and around the project site on the way to project site. - To protect the roads, trucks should have a gross weight within the axial permissible load	To ensure effective traffic management and minimize health and safety risks for the public.	-	Operational budget / Operator	During the operation	Site observation
2.0	**Social Impacts during Operation Phase**							

No	Issue	Potential Impact	Action (Mitigation Measure)	Environmental Risks Liability/ Benefits	Legislative requirement/ EBRD PRs/ Best practice	Investment Needs /Resources/ Responsibility	Timetable	Target and Evaluation Criteria For Successful Implementation
2.1	**Community Health and Safety**	Impact on local people due to traffic, hazardous material handling, noise.	- A grievance mechanism will be developed to receive and manage complaints from project affected people. - Speed limits will be settled for all traffic routes in the project site. - Information boards about public safety hazards and emergency contact information will be available in the wind farm. - The hazardous materials and wastes will be stored on site in a way that community exposure to these substances is prevented. - Legal limits for noise levels will be complied during operation. - Areas where there are high voltage equipment is present will be fenced out and proper safety warning labels will be posted.	To ensure effective social management and minimize health and safety risks for the public.	EBRD PR 4 Best practice	Operational budget / Operator	During the operation	Site observation Complaints received during operation

No	Issue	Potential Impact	Action (Mitigation Measure)	Environmental Risks Liability/ Benefits	Legislative requirement/ EBRD PRs/ Best practice	Investment Needs /Resources/ Responsibility	Timetable	Target and Evaluation Criteria For Successful Implementation
2.2	**Occupational Health and Safety**	Impact on health and safety of the project personnel Impact on labor and working conditions	General mitigation measures regarding occupational health and safety are: -A Safety Manual will be prepared for the operation activities. - Employees will be trained for the health and safety requirements. - The safety harness will be used to secure persons during ascent to and descent from the nacelle of the wind turbine generator system and when carrying out work in areas where there is a risk of falling hazard. Together with the safety harness, the traveling safety hook constitutes a safety device for ascent/descent via the ladder inside the tower. - All the precautions related with working at heights will be taken throughout the construction and operational phases of the proposed project in accordance with the IFC Guidelines and the local regulations. - Material Safety Data Sheets for all chemicals used at the plant will be available at site and in easy reach to concerned employees. - Proper and approved Personal Protective Equipment (PPE) will be provided to all employees handling chemicals and will be trained on their use and maintenance. - Earmuffs and ear-plugs will be provided to the workers in all areas of a potential source of high noise. - Employees will be trained on the proper handling of chemicals and be informed of their hazards.	To minimize the health and safety risks for workers	Turkish Occupational Health and Safety Statue EBRD PR 2	Operational budget / Operator	During the operation	Number of accidents and near-misses

No	Issue	Potential Impact	Action (Mitigation Measure)	Environmental Risks Liability/ Benefits	Legislative requirement/ EBRD PRs/ Best practice	Investment Needs /Resources/ Responsibility	Timetable	Target and Evaluation Criteria For Successful Implementation
			- Key personnel will be trained in first aid and have a valid training certificate. - A first aid box will be located in the nacelle of the wind turbine system for the treatment of minor injuries. - The wind turbine generator system is provided with an emergency exit system consisting of an emergency descending device. The emergency exit consists of a hatch located at the back of the nacelle. - Two fire extinguishers will be available in the wind turbine generator system. One fire extinguisher will be mounted on the down tower assembly in the tower base, the other one on the top box in the nacelle. - Employees will be trained on the use of fire fighting systems and equipment. - The wind turbine will be equipped with lightning protection systems which have the task of diverting the lightning currents arising from lightning strikes and the energy associated with the lightning into the ground in a controlled manner. The turbine will be equipped with receptors, e.g. on the blades, that receive the lightning current and divert it through predefined paths within the turbine to the ground.					

No	Issue	Potential Impact	Action (Mitigation Measure)	Environmental Risks Liability/ Benefits	Legislative requirement/ EBRD PRs/ Best practice	Investment Needs /Resources/ Responsibility	Timetable	Target and Evaluation Criteria For Successful Implementation
2.3	**Human Resources**		- Human resources policies will be maintained appropriate to the workforce. - All workers will receive documentation on their working conditions and terms of employment including their entitlement to wages, hours of work, overtime arrangements and overtime compensation, and any benefits. - Employment decisions will not be made on the basis of personal characteristics, such as gender, race, nationality, ethnic origin, religion or belief, disability, age or sexual orientation, unrelated to inherent job requirements.	To improve working conditions and develop good working relationships	Turkish Labor Law no: 4857, EBRD PR 2	Operational budget / Operator	During the operation	Complaints received from the workers

Table 2-3 ESAP for the Decommissioning Phase

No	Issue	Potential Impact	Action (Mitigation Measure)	Environmental Risks Liability/ Benefits	Legislative requirement/ EBRD PRs/ Best practice	Investment Needs /Resources/ Responsibility	Timetable	Target and Evaluation Criteria For Successful Implementation
1.0	**Impacts during Decommissioning Phase**							
1.1	**Rehabilitation**	Impact on landscape	A site closure plan will be prepared for the decommissioning phase. This plan will include the procedures regarding dismantling of the equipments and land rehabilitation works. Rehabilitation works will include plantation of the site with plants compatible with both the regional conditions and vegetation species of the area.	Reinstatement of the project site	EBRD PR 1 Best practice	Project budget / Decommissioning Contractor	During decommissioning	Site observation Site Closure Plan
1.2	**Waste Management**	Impact on soil, groundwater and surface waters	All types of wastes to be generated during the decommissioning phase will be segregated and disposed properly as mentioned for construction and operation phases. The major type of waste during decommissioning phase will be demolition wastes and they will be stored in proper disposal areas.	Effective waste management Avoid contamination of soil, groundwater and surface waters	EU Directive 2008/98/EC Turkish Regulation on General Principles of Waste Management Turkish Regulation on Control of Excavation Soil, Construction and Demolition Wastes Turkish Hazardous Waste Control Regulation EBRD PR 3	Project budget / Decommissioning Contractor	During decommissioning	Site Observation Methods described in the Site Closure Plan

No	Issue	Potential Impact	Action (Mitigation Measure)	Environmental Risks Liability/ Benefits	Legislative requirement/ EBRD PRs/ Best practice	Investment Needs /Resources/ Responsibility	Timetable	Target and Evaluation Criteria For Successful Implementation
1.3	**Occupational Health and Safety**	Impact on health and safety of the project personnel	The activities during decommissioning phase will be similar to the construction phase. Therefore; - Employees will be trained for the health and safety requirements. - Earmuffs and ear-plugs will be provided to the workers in all areas of a potential source of high noise. - Employees will be trained on the proper handling of chemicals and be informed of their hazards. - Material Safety Data Sheets for all chemicals used at the plant will be available at site and in easy reach to concerned employees. - Proper and approved Personal Protective Equipment (PPE) will be provided to all employees handling chemicals and will be trained on their use and maintenance. - Key personnel will be trained in first aid and have a valid training certificate.	To minimize the health and safety risks for workers	Turkish Occupational Health and Safety Statue EBRD PR 2	Project budget / Decommissioning Contractor	During decommissioning	Site Observation Number of accidents and near-misses

Turkish Regulations

- Industrial Air Pollution Control Regulation issued in the Official Gazette No.27277 dated July 3, 2009
- Regulation on Large Combustion Plants issued in the
- Regulation on Assessment and Management of Environmental Noise issued in the Official Gazette No. 27601 dated June 4, 2010
- Regulation on Control of Excavation Soil, Construction and Demolition Wastes issued in the Official Gazette No. 25406 dated March 18, 2004
- Water Pollution Control Regulation issued in the Official Gazette No. 25687 dated December 31, 2004
- Solid Wastes Control Regulation issued in the Official Gazette No. 20814 dated March 14, 1991
- Regulation on General Principles of Waste Management issued in the Official Gazette No. 26927 dated July 5, 2008
- Packaging Waste Control Regulation issued in the Official Gazette No. 26562 dated June 24, 2007
- Waste Oil Control Regulation issued in the Official Gazette No. 26952 dated July 30, 2008
- Regulation for Control of the Tires Which Have Completed Their Life-Cycles issued in the Official Gazette No. 26357 dated November 25, 2006.
- Regulation on Control of Waste Batteries and Accumulators issued in the Official Gazette No. 25569 dated August 31, 2004
- Hazardous Waste Control Regulation issued in the Official Gazette No. 25755 dated March 14, 2005
- Medical Waste Control Regulation issued in the Official Gazette No. 25883 dated July 22, 2005
- Bylaw on the Measures to be taken at Work sites and Works Utilizing Flammable, Explosive, Hazardous and Detrimental Materials in the Official Gazette No. 14752 dated December 24, 1973.
- Occupational Health and Safety Statue issued in the Official Gazette No. 14765 dated January 11, 1974
- Health and Safety Regulation for Construction Works issued in the Official Gazette No. 25325 dated December 23, 2003
- Regulation on High Voltage Electricity Installations issued in the Official Gazette No. 24246 dated November 30, 2000

EU Directives

- Directive 2008/50/EC on ambient air quality and cleaner air for Europe
- Directive 2001/80/EC on the limitation of emissions of certain pollutants into the air from large combustion plants (the LCP Directive)
- Directive 2002/49/EC relating to the assessment and management of environmental noise
- Directive 91/271/EEC concerning urban waste water treatment
- Directive 2008/98/EC on waste (Waste Framework Directive)
- Directive EC 1907/2006 concerning the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH)
- Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora
- Directive 2004/40/EC on the minimum health and safety requirements regarding the exposure of workers to the risks arising from physical agents electromagnetic fields.
- Directive 85/337/EEC on the environmental impact assessment