Environmental and Social Review Summary

Rolling stock for the Üsküdar-Ümraniye-Çekmeköy metro line

This Environmental and Social Review Summary (ESRS) is prepared by MIGA staff and disclosed prior to the date on which MIGA’s Board of Directors considers the proposed issuance of a Contract of Guarantee. Its purpose is to enhance the transparency of MIGA’s activities. This document should not be construed as presuming the outcome of the decision by MIGA’s Board of Directors. Board dates are estimates only.

Any documentation that is attached to this ESRS has been prepared by the project sponsor, and authorization has been given for public release. MIGA has reviewed the attached documentation as provided by the applicant, and considers it of adequate quality to be released to the public, but does not endorse the content.

Country:  Turkey
Sector:    Infrastructure
Project Enterprise:  Istanbul Metropolitan Municipality, Anatolian Side Rail System Directorate
Environmental Category:  B
Date ESRS Disclosed:  October 17, 2014
Status:    Due Diligence

A. Project Description

MIGA has been requested by BNP Paribas, acting as agent for itself and Credit Agricole Corporate And Investment Bank, to provide guarantee for non-shareholder loan to Istanbul Metropolitan Municipality (IMM), to procure and commission the rolling stock (Project) for the Üsküdar-Ümraniye-Çekmeköy (UUC) metro line, currently under construction in Istanbul, Turkey. The new UUC metro line, on the Asian side of Istanbul, will be 17 km in length and will include 16 stations and one depot. Construction of the line commenced in the second quarter of 2012 and is expected to be completed by the second half of 2016. The line will connect inland residential area of Çekmeköy with Üsküdar coastal area, and it will enable passengers to transit directly to another metro line at the Marmaray Tunnel, which crosses the Bosphorus, thus reducing traffic congestion. Construction and electromechanical works for the line are carried out by Doğuş Construction and are not covered by MIGA guarantee. The construction of the new UUC metro line has been supported by €700 million loan from European Investment Bank (EIB), signed in 2011.¹

The UCC line will, for the first time in Turkey, consist of 21 driverless trains of 6 metro cars each (total of 126 metro cars) that will be procured from the joint venture (JV) of Mitsubishi Corporation of Japan and Construcciones y Auxiliar de Ferrocarriles SA (CAF) of Spain. The operator of the UUC line is Istanbul Ulaşım (IU) same operator for Kadıköy-Kartal-Kaynarca

(KKK)\textsuperscript{2} metro project that MIGA provided guarantee coverage in 2011. KKK project is in compliance with environmental and social requirements of MIGA.

**B. Environmental and Social Categorization**

This is a Category B project under MIGA’s Policy on Environmental and Social Sustainability. The project is expected to have environmental and social (E&S) impacts that are generally site-specific and largely reversible. Those impacts can be avoided or mitigated by adhering to recognized Performance Standards, operating procedures, and guidelines as described in the following sections.

The key E&S issues relate to managing occupational health and safety during construction and operation; handling land acquisition and compensation; managing economical displacement related to taxi dolmus drivers; proper communication of environmental and social management plans (ESMPs) including traffic circulation plan for operation, community health and safety during construction and operation, air quality, noise; and spill management (particularly during the construction phase).

Information on how these E&S issues are, or will be, addressed by the project to comply with MIGA’s Performance Standards and World Bank Group (WBG) Environmental, Health and Safety (EHS) Guidelines is contained in the following sections.

**C. Applicable Standards**

While all Performance Standards are applicable to this project, based on our current information indicates that the project will have impacts which must be managed in a manner consistent with the following Performance Standards:

- PS1: Assessment and Management of Environmental and Social Risks and Impacts
- PS2: Labor and Working Conditions
- PS3: Resource Efficiency and Pollution Prevention
- PS4: Community Health, Safety and Security
- PS5: Land Acquisition and Involuntary Resettlement

E&S issues associated with the following PSs were not encountered during the assessment of the project:
- PS6: Biodiversity Conservation and Sustainable Management of Living Natural Resource is not triggered as there are no known impacts on conservation or biodiversity.
- PS7: Indigenous Peoples is not expected to be triggered as no known indigenous peoples are within the areas of the project; and
- PS8: Cultural Heritage is not triggered as the project is not located in areas of known historical or cultural significance.

The project will be required to comply with the WBG EHS General Guidelines and EHS Guidelines for Railways.

\textsuperscript{2} Project documents can be found on http://www.miga.org/projects/index.cfm?aid=2948
D. Key Documents and Scope of MIGA Review

The documents reviewed by MIGA include:

- İstanbul Metropolitan area urban transportation master plan – May 2011
- Project Introduction Folder and annexes prepared for Istanbul Ulasim AS. By Mimko consultants - August 2006
- Environment, Health and Safety Plan for construction by Dogus - Sept 2013
- Solid Waste Management Plan by Dogus - Sept 2013
- Emergency Plan for construction by Dogus - Sept 2013
- Several permits for solid waste disposal
- Seismic analysis by the Middle East Technical University – 2013;
- Annual Progress Report 2, prepared by Yüksel Proje International Inc. – Emay International Engineering Consultancy Inc. JV – March 2014;
- Annual Environmental Monitoring Report – March 2014; and
- Definitive Application for a MIGA Guarantee.

MIGA’s review of the project also included a site visit to selected construction sites, meetings with IMM, Contractor (Dogus), Directorate of Environment and Forestry – Istanbul, and Real Estate and Land Acquisition department of IMM and correspondence comprising of environmental and social information submitted by the Project.

E. Key Issues and Mitigation

PS1: Assessment and Management of Environmental and Social Risks and Impacts

Environmental and Social Assessment and Management Systems

A Project Introduction Folder (PIF) was completed in August, 2006 for Üsküdar-Ümraniye-Çekmeköy metro line by Mimko consultants under a contract by the IMM in order to comply with Turkish environmental permitting requirements. The PIF contains a preliminary evaluation of potential environmental impacts and descriptions of mitigation measures of the physical environment including issues such as land use, water and energy consumption, liquid and solid wastes, and emissions. The PIF was reviewed by a commission by the Governorate of Istanbul Environment Directorate (on behalf of the Turkish Ministry of Environment and Forestry). As no Environmental and Social Impact Assessment (ESIA) study was required for the project is “annex/group II type”, no project consultation was done.

Main line starts with the Üsküdar station to be built in Üsküdar square and continues with 17 km long tunnel of TBM/EPB and NATM technique and finally reaches Çekmeköy Station. In addition, there is a diversion from the main line of length 2.7 km at for Deport Area.

During the construction phase, the contractor (Dogus Construction and Trade Inc.) applies its corporate quality and environmental, health and safety (EHS) management program which is consistent with International Organization for Standardization (ISO) 9001:2008 for Quality, ISO 14001:2004 for Environmental Management System and the British Standard for occupational health and safety management systems OHSAS 18001:2007. Operational procedures and a manual for occupational health and safety and workers’ training are also in place and being implemented by the contractor and subcontractors. Dogus developed an Environmental, Health and Safety Plan (EHS) which presents appropriate measures for noise and vibration, spoil, ground
water, waste, dust, vehicle and plant emissions management, emergency response, and occupational health and safety measures. Throughout the entire construction phase the contractor presents progress reports to IMM including environmental monitoring reports and the project is monitored by an independent consultant (Testmer Ölçüm Hizmetleri Firması) on monthly basis. The EHS system is prepared by SEÇ (Sağlık Emniyet Çevre) subsidiary of the contractor company. MIGA will require the contractor to update existing EHS management program to include the requirements of Performance Standards.

During the operation phase, IMM is responsible as a project owner to ensure that the operation of the project will be performed in compliance with national regulations. Istanbul Ulasm (IU) will be operating the system through a contract awarded by IMM similar to the KKK metro project. IU will apply its established integrated quality, environmental, health and safety (EHS) management system that is certified to ISO 9001:2008, ISO 14000:2004 and OHSAS 18001:2007. IU will continue to train its employees on its corporate EHS standards and procedures which include aspects relevant to the occupational hazards of the project, environment and public safety.

Monitoring: As mentioned above the project is independently monitored by a third party during construction on monthly basis. Consulting Firm oversees the environmental management plan/system on a monthly basis. IMM as part of contractual requirements will be monitoring operator regularly and reports will be submitted to respective authorities including environmental monitoring.

Organizational Capacity and Competency

According to Dogus organizational structure there are separate functions for Quality Control, Quality Assurance (QA/QC), and occupational Health, Safety and Environment (HSE). All report to General Manager. The HSE team is responsible for environmental policy implementation and requirements of OHSAS 18001:2007.

IMM’s Directorate of Occupational Health and Safety is in charge of environment, health and safety. Also “Occupational Health and Safety Commission” in the Department of Rail System of IMM keeps coordinates with the Directorate of Occupational Health and Safety. IU has its own EHS team responsible for planning regular staff training on occupational and passenger health and safety, as well as supervising and monitoring the works of the technical staff and the rail systems in relation to occupational and passenger safety.

Dogus and its sub-contractors’ workers are given toolbox training regularly (2 or 3 times of a week). All workers go through a half-day safety training before they are hired. Also additional professional training is provided as needed on specific topics.

Emergency Preparedness and Response

According to IMM master plan, “disaster management for transportation infrastructure” is in place to properly manage natural disaster risks and effects on transportation network. The master plan considered recommendations in the Earthquake Master Plan (EMP) for İstanbul that was prepared by İMM in July 2003.

IMM will document for UUC metro line an updated emergency preparedness and response plan for operation including firefighting, evacuation of the station, vehicles, facilities, flood, bad weather conditions, earthquake, derailment, unauthorized access, sabotage and response to spills
in line with PSs and WBG EHS requirements. As this is the first driverless metro in Turkey, MIGA will require details of training on the E&S Management Plan as well as the Emergency Preparedness and Response Plan.

Emergency Response Plans will be developed for each station which is in line with a corporate level plan. There will be fire-fighting and emergency response teams within each station. In cases of emergencies, the train will stop at the nearest station and the Traffic Control Centre is notified through signalization. There is a main control room (Traffic Control Centre) and each station has its own control room.

**Stakeholders Engagement**

As mentioned earlier, an ESIA study was not required for the project; hence, no community consultation was done and no E&S documents were disclosed. IMM and Uskudar district municipality presented the project information (type of construction; progress of construction; passenger capacity) on their websites. IMM have a grievance mechanism system through complaint boxes/tables mostly accessible to general public. IMM, as part of public relations activities, invite citizens to join site visits to various new projects. IMM will disclose related project information and extend the grievance mechanism to capture any concerns about the project.

The loss of employment of minibus drivers who are currently serving Üsküdar line is among one of the project’s key potential adverse impacts. IMM explained that the Municipality started discussion with the union of minibus drivers and owners. Studies towards eliminating in the most suitable way the above cited issue are carried out by relevant Municipality’s responsible plans to permit them to work on other lines.

**PS2: Labor and Working Conditions**

**Human Resource Policy and Management:** The project currently employs about 2,252 workers for construction, 1,040 at NATM tunnel works and 409 at TBM tunnel works. In addition to 107 employee working at IMM and Chamber Firm on that project. Turkey has ratified the core International Labour Organization (ILO) Conventions on freedom of association, discrimination, child labor and forced labor that apply to IMM employees as part of national labor law. Dogus’ labor practices for its direct and contracted workforce and HR policy are aligned with national law. Contractor will be required to extend grievance mechanism to subcontractors in accordance to requirements of PS2.

**Worker health and safety:** Tunneling and cave-ins are significant risks to workers’ health and safety during the construction phase. Other risks are associated with high capacity hoisting equipment and electrical power installations. Dogus’ occupational health and safety (OHS) procedures included tunneling safety, emergency rescue procedures for underground workings, use of explosives, as well as crane/lifting equipment safety. Tunneling safety has already been extensively considered through the geotechnical investigations conducted as part of the baseline assessments. Traditional tunneling methods such as the New Austrian Tunneling Method (NATM) (which include the use of explosive charges in rock sections) have been used in the construction following internationally recognized underground excavation safety standards following a documented procedure.
All workers throughout the construction phase go through regular health checks (including lung, eye, odiometri, hemogram, pulmonary function tests) once a year. Dogus will submit periodic OHS monitoring reports to IMM.

Dogus will prepare Project Security Plan to identify and address construction phase security and emergency issues. The plan will include risk procedures and analysis; emergency action plan; OHS regulations and instructions; inspection plan; training notes, etc.

Project construction activities included operation of a construction worker camp that houses 540 workers and operated by Dogus. Adjacent to the camp, subcontractors operate a smaller camp which houses around 250 workers. Dogus provides three meals a day to all workers, including subcontractors’ workers. Part-time medical doctors and health workers are available at the main construction camp.

PS3: Resource Efficiency and Pollution Prevention

Resource Efficiency

The new Metro Vehicles will run on electrical energy, powered by a 1500 VDC rigid catenary system. The electricity is supplied to the metro line from three distinct transformers connected to the main line of Istanbul. The three transformers are used for backup in order to maintain redundancy. In case of power shortage on the whole city or failure of all the three transformers, diesel powered generators supply the system in 15 seconds in order to take the trains, which are stuck in the tunnels, to the nearest stations.

As part of the national energy management plan, IMM will develop an energy management system including energy reduction scheme, periodical monitoring, reviewing and reporting of its energy and fuel consumption as well as greenhouse gas (GHG) emissions IU targets to achieve a maximum consumption of 18,9 kWh/km/train (in case of fully loaded 6-car trainset) during the operation.

IMM reported that expected natural gas consumption during construction would amount to 360,000 cubic meters per annum (m3/yr) and energy consumption is expected to be 800,950 kWh/year. Dogus has no projection available regarding any savings in energy consumption.

Water

During the construction phase, the project utilizes significant amounts of water for tunneling machine operation and workers consumption (hygiene, etc). Estimated consumption for the tunneling system operation in the remaining portion of the UUC line is 995 m3/day by TBM and 1155 m3/day by NATM. For concrete production it is estimated to be of 850 m3/day. Water is provided by the public water network served by Istanbul’s Water and Sewerage Authority without compromising the availability of water for the local population. Wastewater discharges from sanitary facilities and from dewatering of tunneling operations are discharged into the public sewerage network following applicable regulations and under conditions permitted by the Sewerage Authority. Water quality is tested regularly to ensure compliance with national requirements.
Pollution Prevention

During construction phase, solid and liquid waste, noise and vibration, dust, vehicle and plant emissions, hazardous material (waste oil, cleaning solvents from equipment maintenance and repair) are the main sources of pollution.

Waste

The most significant non-hazardous solid waste generated during the construction phase is the tunneling excavation spoils consisting of crushed rock or unconsolidated materials mixed with drilling bentonite grout, drilling foams. This material is brought to the surface and allowed to dry before it is distributed for road construction base material (if consisting of crushed rock) or sent to approved landfills licensed by the Istanbul Metropolitan Municipality. Construction and demolition materials are recycled to the extent possible. Other types of non-hazardous solid waste generated during the construction and operational phase of the project includes general food and cleaning wastes which are collected by the public waste management services for disposal at the municipal landfills. Dogus has a waste management system that includes waste segregation and quantification. Solid waste is delivered against a protocol signed with sub-provincial municipalities dependent on IMM. Solid waste disposal permits were acquired by the project.

Hazardous Materials

Construction and operational activities will generate hazardous wastes, such as waste oil or used cleaning solvents from equipment maintenance and repair activities. These materials will be temporarily stored in closed containers made of materials compatible with the contents and placed in specially designated areas (Soganlik site) with secondary containment and protection from the weather. Dogus has an agreement with a licensed disposal firm Cevkim.

Greenhouse Gas Emissions (GHGs)

Although the project construction phase entails the consumption of fuel oil for the operation of heavy equipment, after the construction phase the project will have an overall significant positive contribution toward the avoidance or reduction of fossil-fuel derived GHGs during the operational phase. Without this metro system expansion, estimates project a substantial growth in bus and minibus transit along the Asian side. When UUC Metro line starts commercial operation, it is estimated that 315 buses and 722 minibuses will be redirected to the routes that will support UUC Metro Line or other routes.

Air quality

Dust can be a major source of pollution during construction. Watering haul roads and unsealed access roads, washing wheels of trucks leaving construction zones, covering loaded trucks leaving the site, tunnel ventilation are among the mitigation measures implemented. Air quality/dust tests have been conducted by a laboratory licensed by the Ministry of Health. Results have shown that dust is below the limits.

During the construction phase, Dogus ensures that construction equipment and vehicles are properly maintained to comply with local emission standards. During the operation phase, IU will extend the application of its air quality monitoring program in stations to address the potential
presence of particulate matter originating from train operations (e.g., wear of wheels and brake linings), and introduced into tunnels and stations by maintenance and remodeling activities. The information being gathered through the on-going monitoring programs are used to evaluate and implement dust emission reduction/prevention and control strategies at new and existing facilities.

Noise and vibration impacts associated with the construction are due to tunneling and surface works, demolition of existing structures, road works, and construction of new surfaces, and from spoil removal. Vibration impact is less significant, but is a potential concern. Restricting operating hours, community consultation, regular information bulletins and monitoring noise levels to respond complaints are among the measures implemented. Noise and vibration measures are implemented.

The above summarized procedures and mitigation measures are consistent with MIGA’s PS3 requirements.

PS4: Community Health, Safety and Security

All station construction sites are in densely populated urban settlements, and measures are required to mitigate risks associated with construction equipment and vehicles and the general public. All construction sites are clearly fenced and closed to public access. Gates are controlled by unarmed security guards. IMM and Dogus will prepare traffic circulation plans for construction equipment to be approved Metropolitan Municipality Traffic Department. When necessary, the IMM, working in concert with contractors and the engineering consultants, plans for traffic pattern changes and alerts the public of these changes through local mass media and the IMM’s website. Additionally, the majority of heavy equipment and materials transport activities to and from the construction sites are conducted outside peak traffic hours in order to minimize the risk of accidents and exacerbation of traffic. In addition, traffic circulation plan for rolling stock will be presented to MIGA prior to transport of equipment.

Project infrastructure, including underground tunnels and stations, has been designed to meet internationally recognized engineering and safety standards. Stations and trains will be equipped with safety communication systems to be able to provide instructions to passengers on proper evacuation routes from tunnels. More than one exit will be built in each station so as to allow emergency evacuations. Fire resistant structures and equipment will be used. Ventilation systems will be automatically operated. IU will implement a railway hygiene program consisting of regular disinfection of metro surfaces, escalators, elevators and stations. Safety specifications for electromechanical equipment include a collision avoidance system for trains, emergency alarms and communications systems in the trains and passengers stations and intruder protection alarms in restricted access areas representing potential hazards (such as electrical installations in passenger stations).

Security Personnel: Unarmed contracted guards control and monitor the construction sites. As all construction sites in urban areas there are police stations in close proximity. During operation phase, IU will be in charge of implementing security programs which will consist of armed and unarmed security personnel and security systems (including video surveillance) to monitor stations and tunnels and ensure compliance with PS4 requirements on use of security personnel.
PS5: Land Acquisition and Involuntary Resettlement

Acquisition of private land was minimized. Location of stations and shafts were chosen to avoid resettlement and minimize impacts on privately owned land. Total of 11 plots (which include 9 structures) were acquired for the project and 44 owners were affected. IMM’s preference is to acquire the land through “willing buyer/willing seller” approach. Although most cases solved through “willing buyer/willing seller”, there are 4 ongoing court cases/disputes for land spots in Üsküdar and Imam Hatip Lisei stations. Based on IMM’s real estate and land acquisition department’s explanation it seems that the practice is to pay the market value of the affected property, but it is not the replacement cost (as per definition by PS5). As MIGA involvement is after acquisition and compensation, IMM will establish a grievance mechanism for affected people as per the requirements of PS5.

F. Environmental Permitting Process and Community Engagement

As mentioned earlier, this project was assessed as “annex/group II type” as per environmental legislation of Turkey by the Istanbul Environment and Forestry Directorate as such no ESIA is needed. As was explained in Section E of this ESRS, a PIF was completed in 2006. The PIF was reviewed by a commission by the Governorate of Istanbul Environment Directorate (on behalf of the Ministry of Environment and Environment) and it was resolved that no full environmental impact assessment is required for the project. An additional exemption letter was issued on July 04, 2014 confirming with the decision that impact assessment is not required.

The operator, IU, is a public customer-focused organization. As part of its quality management system, it employs various channels to inform the public about its operations and to receive and process grievances. These channels include IU’s website (http://www.istanbul-ulasim.com.tr), email address, call center, announcements in magazines and brochures, customer satisfaction surveys, and suggestion boxes in every station.

G. Availability of Documentation

1. Project Information Folder (Proje Tanitim Dosyasi)
2. Environmental and Social Action Plan

The above listed documentation is available electronically as PDF attachments to this ESRS at www.miga.org. It is also available for viewing at the following locations:

http://www.ibb.gov.tr/tr-tr/kurumsal/birimler/ raylisistemlerdb
http://www.uskudarumraniyecemekoymetrosu.com