The Black Sea Trade and Development Bank, BNP Paribas, Societe Generale, Swiss ECA/SERV

Istanbul Metropolitan Municipality Waste to Energy

Non-Technical Summary

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Contents

Abbreviations

BSTDB	Black Sea Trade and Development Bank
CLO	Community Liaison Officer
EIA	Environmental Impact Assessment
EPC	Engineering, Procurement and Construction
ESAP	Environmental and Social Action Plan
ESDD	Environmental and Social Due Diligence
GHG	Greenhouse Gas
IFC	International Finance Corporation
IMM	Istanbul Metropolitan Municipality
ISTAC	Istanbul Environmental Management Industry and Trade Inc.
IUCN	International Union for Conservation of Nature
KBA	Key Biodiversity Area
NTS	Non-Technical Summary
OHTL	Overhead Transmission Line
PS	Performance Standards
SEP	Stakeholder Engagement Plan
TUIK	Turkish Statistical Institute
WtEP	Waste-to-Energy Plant

1 Introduction

The Black Sea Trade and Development Bank, BNP Paribas, Societe Generale, and Swiss ECA, SERV (the 'Lenders/SERV') are considering providing finance to Istanbul Metropolitan Municipality (IMM) for the construction of a greenfield solid waste incinerator with energy generation capacity (the 'Project') in Kisirmandira, Eyupsultan District of the Istanbul Province.

The EPC contract for the Project was awarded to Hitachi Zosen İnova – Makyol İnşaat Sanayi Turizm ve Ticaret A.Ş. Joint Venture (the 'EPC Contractor').

The Lenders/SERV have commissioned Arup Mühendislik ve Müşavirlik Ltd. Şti. ('Arup' or the 'Consultant') to carry out Environmental and Social Due Diligence (ESDD) for the Project. This Non-Technical Summary (NTS) forms part of the ESDD documentation, along with the ESDD report, an Environmental and Social Action Plan (ESAP), a Cumulative Impact Assessment (CIA) and a Stakeholder Engagement Plan (SEP). The task involves evaluation of the Project documentation, including an existing national Environmental Impact Assessment (EIA) report (2012), and Project practices against the International Finance Corporation's (IFC's) Environmental and Social Sustainability Policy (2012) and its Performance Standards (PSs), as well as applicable national and international requirements. The ESAP prepared by Arup aims to ensure that the Project is aligned with these standards.

The ESDD has been focused on the waste to energy plant (WtEP) element of the Project. Little information was available regarding the overhead transmission lines (OHTL) related to the Project. However, it is anticipated that the risks and impacts associated with this would be low in magnitude.

This NTS describes the Project characteristics, the baseline conditions of the Project area, the potential impacts of the Project, and the mitigation measures proposed.

2 Project Description

2.1 Project Area Description

The Project is located in Istanbul province, Eyupsultan district, Kisirmandira neighbourhood. The Project area is located 15 km north-west of Eyup district center, 7 km north-west of Gokturk Neighborhood, 1.3 km south of Ihsaniye Neighborhood and 600 m south-west of Isiklar Neighborhood. The area of the Project Area is 8 ha. It is next to an existing compost plant owned by IMM and operated by ISTAC, IMM's waste management company. The location of the Project area is presented in Figure 1.

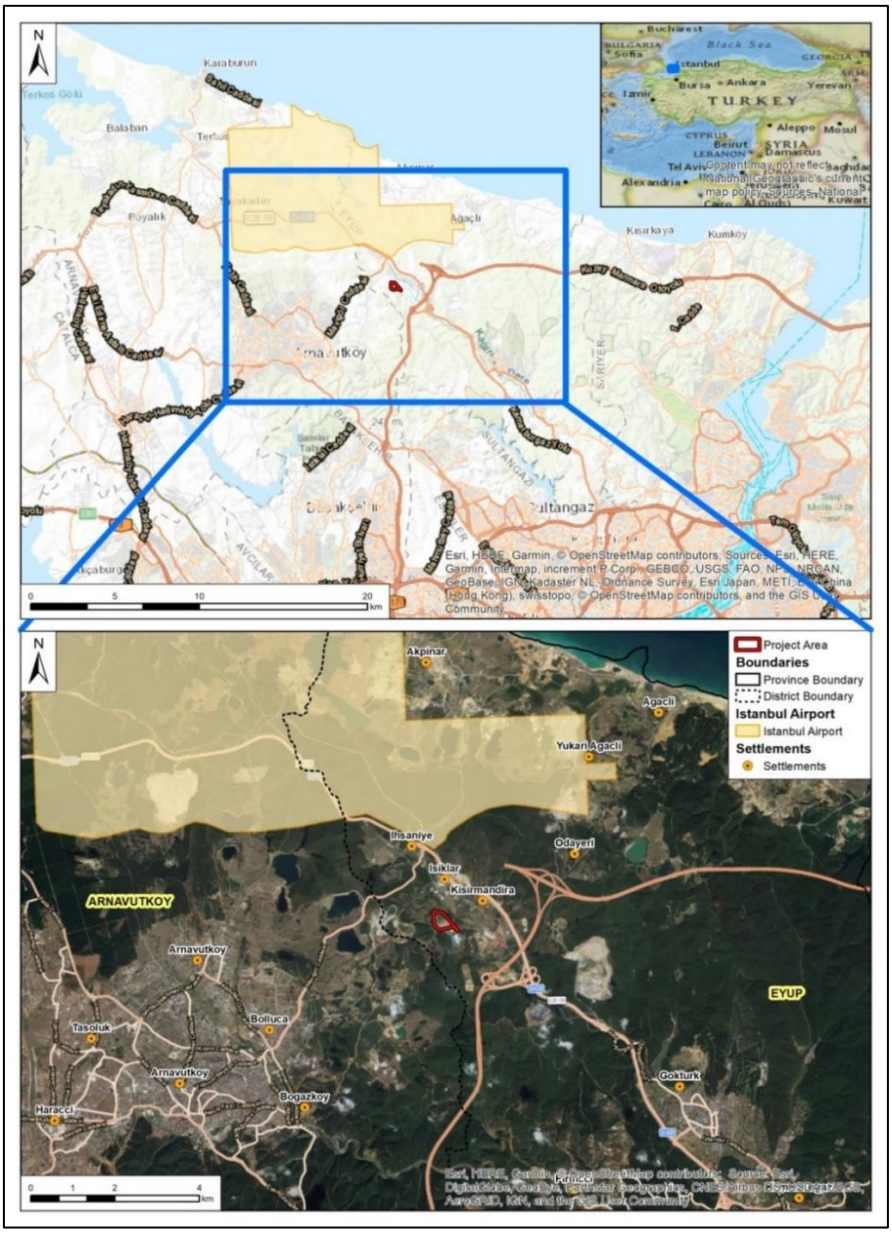

Figure 1. Location of the waste-to-energy plant

2.2 Project Characteristics

The WtEP will generate energy from municipal waste of Istanbul through combustion of municipal solid waste. This waste will be collected from the district municipalities of the European side of Istanbul, specifically from Silivri, Halkali, Yenibosna, and Baruthane Transfer Stations. The waste will be transported to the WtEP without any pre-treatment and electrical energy will be produced by the incineration technology. There will be no waste storage at the Project Area.

The capacity of the WtEP will be 3,000 tonnes per day, which will produce up to 90 MW of electrical energy. It is planned that the WtEP will work 24 hours daily and 8,000 hours annually. The produced electric energy will be exported to the national grid through the nearby Tasoluk and Habibler substations. New OHTL will be constructed to link the WtEP to the substations.

Ash generated as a result of combustion of wastes will be removed from the WtEP for disposal at landfill sites.

It is anticipated that 352 trucks will transport waste to the WtEP daily, along with 46 trucks removing ash from the WtEP.

The elements that will make up the WtEP are listed below and the layout is presented in Figure 2.

- Waste Receiving Unit
- Waste Bunker
- Waste Feeding System
- Combustion Unit
- Boiler
- Turbine Generator
- Cooling System, comprising Air Cooled Condensers (ACC)
- Flue Gas Treatment System

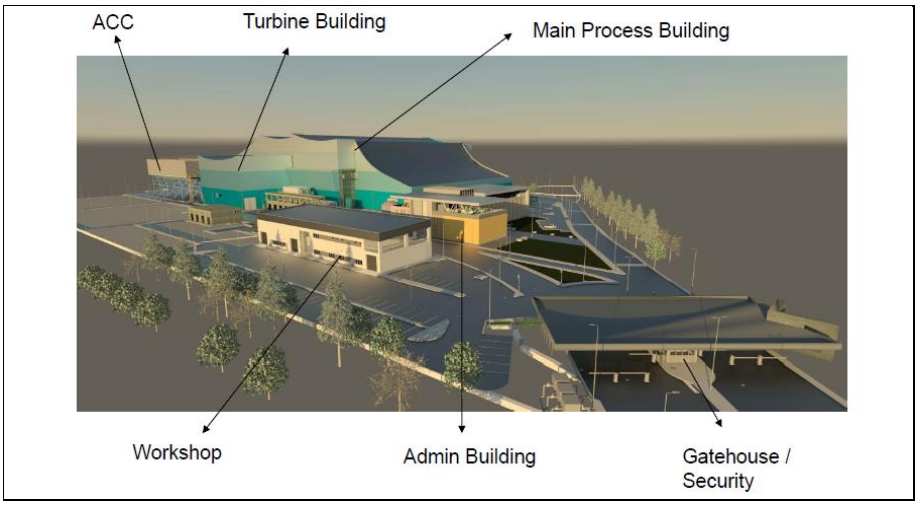

Figure 2. General Layout of the Project

Construction of the waste to energy plant has already begun and it is planned to be completed in April 2020.

2.3 Alternatives to the Project

2.3.1 Project Area Alternatives

A review of potential alternative sites was carried out to determine if other sites would be preferable to the Project Area. Among 11 sites considered initially, three sites were selected for further analysis. These sites were Hasdal, Compost and Odayeri. Environmental, economic and technical issues were taken into consideration. The existing sewer system at the compost plant adjacent to the Project Area was a key factor ultimately, and the Project Area was selected.

2.3.2 Technology Alternatives

Incineration of waste is one of a number of possible thermal disposal methods. Grate combustion technology was selected on the basis of the following advantages:

- No pre-treatment requirement.
- Resistant to variations in waste composition.
- High thermal efficiency.
- Minimises problems such as storage gas, leachate and odour.

A significant reduction in the volume and weight of waste requiring landfill will be achieved with this incineration system. In addition, heat from the combustion process will be converted to useful energy.

3 Legislative Framework

A national Environmental Impact Assesment (EIA) Study was conducted in 2012 for the Project and approved by the Turkish Republic Ministry of Environment and Urbanization with an “EIA Positive” decision.

A Gap Analysis and Scoping Study was carried out in 2019 to identify gaps between the national EIA and other key project documentation against the requirements of the International Finance Corporation (IFC) Performance Standards (PSs) and Turkish Legislation. The gap analysis study concluded that an Environmental and Social Due Diligence (ESDD) study that contains Environmental and Social Action Plan (ESAP), Stakeholder Engagement Plan (SEP) and Non-Technical Summary (NTS) would be required.

4 Environmental and Social Baseline Conditions

4.1 Characteristics of Physical Environment

4.1.1 Geology

The Project Area is covered with heterogeneous type artificial fill on the surface reaching up to a height of 10.20 meters in some places.

4.1.2 Natural Hazards and Seismicity

Natural disasters such as landslide, snow slide rock fall, avalanches do not occur around Project area.

According to the Turkish Earthquake Zones Map, the Project area is in a 3rd degree earthquake region, which means the Project is located in a medium seismic risk area.

4.1.3 Hydrogeology

During the EIA studies for the Project, investigations were conducted to assess the availability of groundwater. These showed that there is no groundwater source at the Project Area. The groundwater depth ranged between 5.00 and 16.45 m on the Project Area.

4.1.4 Water Resources

There are no surface water bodies in the vicinity of the Project Area. However, standing water and intermittent flows resulting from seasonal precipitation were observed.

The nearest surface water bodies are Göktürk Pond and Alibeyköy Lake, which are 3 km and 7 km away from the Project Area, respectively.

4.1.5 Land Use, Soil and Landscape

According to the Land-Use Database of the region, the land allocated to IMM for the Project is designated as forest lands, non-calcareous brown forest soil and lands that are not suitable for cultivated agriculture.

The Project Area was allocated to IMM by the General Directorate of Forestry for 49 years. Additional land was also leased from the General Directorate of Forestry for disposing of excess excavated material by IMM and the EPC Contractor.

4.1.6 Protected Areas

There are no Key Biodiversity Areas (KBAs) and/or nationally protected areas within the Project area or in the area potentially subject to impacts. The closest KBA to the Project area is West İstanbul Pastures, which is located 4.1 km to the south. The Bosporus KBA is located 4.6 km to the east and Agacli Sand Dunes KBA is located 4.9 km to the north. The closest nationally protected area is the Göktürk Lake Natural Park, which is 5.9 km from the Project Area.

4.1.7 Meteorology and Climatic Conditions

Eyüpsultan District, where the Project Area is located, is situated at the intersection of the Mediterranean and Black Sea climate types, at a transition area where Mediterranean climate and Black Sea climateis predominant.

4.1.8 Air Quality

Measurements were conducted at the Project Area in 2012 in order to measure dioxin and furan concentrations. All results were far below the limit values set by the relevant regulations.

Concentrations of other airborne pollutants (SO_2, NO_2, HCL and HF) were measured at eight points within the impact area of the Project between January 2011 and February 2012. Fine particulate matter concentrations were measured at one point at Isıklar Village, the closest settlement to the Project area. All results were in compliance with the limit values set by the related regulations.

The baseline data provided in the EIA study is seven years old. It is recommended that a new air quality survey is conducted to reflect the impacts of other recent infrastructure development (subways, highways, airport etc.) occurred in the close vicinity of the Project area.

4.1.9 Noise

Noise measurement studies were conducted at Işıklar Neighbourhood on 03-04.09. 2011. According to the results, noise levels in the vicinity of the Project Area were below the limit values set by the Regulation on Environmental Noise Assessment and Management published by the Official Gazette no. 27601 and dated 04.06.2010.

Although the noise survey data is considered to be technically adequate, the data is eight years old and does not reflect current conditions in the vicinity of the Project area. It is recommended that a new noise survey is performed to establish baseline noise levels at the nearest receptors.

4.2 Characteristics of Biological Environment

4.2.1 Terrestrial Flora

Within the Project area, floristic species inventories and the habitat structures present were determined following desk and field studies conducted during the EIA stage of the Project. 140 plant species were identified. The semi-natural areas (mixed deciduous forests) around the Project area were determined to be under intense anthropogenic pressure due to surrounding settlements and other construction activities.

Among the identified and/or potential flora species that are located in and around the activity area, none are endemic, rare, or endangered and there are no protected flora species present.

4.2.2 Terrestrial Fauna

Mammals, birds, amphibians and reptiles within and in the vicinity of the Project area were identified by desk and field studies conducted for the EIA. It was found that there were no endangered species present.

4.3 Characteristics of Social Environment

The nearest residential areas to the Project area are Isiklar and Ihsaniye Neighbourhoods, which are located 600 m and 1.3 km from the Project Area, respectively.

The Project area is on state-owned land and there were no economic, agricultural or residential activities on it. The EPC Contractor has aligned the site fencing to ensure that a route used by local herdsmen to access pastures is not blocked.

According to the Address Based Population Registration System (TUIK, 2018), the population of Eyup district is 383,909. The populations of Isiklar and Ihsaniye Neighbourhoods are 547 and 189, respectively.

In the EIA report for the Project, it was stated that 34% of population of Eyup district is working in the manufacturing sector and 27% in the service industry. It was also stated that the income of Eyup residents is low.

A Public Participation Meeting for the Project was conducted at the meeting hall of the IMM Waste Processing Recycling and Compost Plant on 20.12.2011 in order to obtain public participation to the EIA process, inform the public regarding the activity and receive their opinions and suggestions.

During the site visits performed as part of this ESDD, meetings were held with the muhtars of Ihsaniye and Isiklar Neighbourhoods in order to understand the communities' concerns regarding the Project. These primarily related to the potential for odour nuisance and harmful emissions to air. The implementation of a Stakeholder Engagement Plan and Grievance Mechanism for the Project will help to alleviate these and any other concerns of the communities.

5 Assessment of Environmental and Social Risks

5.1 Impacts on Air Quality

In the construction phase, there is the potential for impacts on air quality due to material handling, vehicle movement, and emissions from heavy machinery. Dust generation can be managed by implementing mitigation measures such as water spraying of unpaved roads during summer, setting speed limits, etc. When considering the nature of the works and the distance to the nearest settlement (Isiklar Neighbourhood – 600 m), the impacts will not be significant assuming the implementation of these mitigation measures and adherence to good construction methods.

In the operation phase, a variety of technologies will be used to reduce emissions of harmful substances from the WtEP. Dioxins and furan emissions, in particular, will be minimised.

In 2015, an air quality modelling study was carried out in 2015. The stack height had initially been determined as 60m above ground level. However due to the proximity of the new Istanbul Airport, the stack heigh was reduced and modelling studies were completed to assess emissions from a lower stack. The modelling was carried out using AERMOD and PK 3781 software. The minimum stack height was determined to be 23m and a height of 40m was selected. This was later increased to be 3m taller than the building (43m). The Consultant notes that this is considerably lower than would normally be expected for a stack internationally. It is not clear if the studies considered the presence of the WtEP buildings. Building downwash affects plume dispersion and might result in a requirement for a higher stack. The Consultant recommends that the modelling study is re-run taking the WtEP buildings into consideration. The scenarios used during the modelling study should cover start-up, planned, unplanned and emergency disruption/shutdown cases as well as normal operations.

An Air Quality and Emissions Management Plan will be implemented. This is expected to cover planned and unplanned shutdowns and emergency situtations in addition to normal operation.

Odor will contained within the bunker area of the WtEP by drawing air through the tipping hall for the combustion process.

5.2 Impacts on Geology, Soil and Contaminated Land

In the construction phase, there will be loss of a small amount of topsoil. In addition, soil contamination may occur due to accidental oil spills or leaks. This may affect the soil quality in the Project area. However, these impacts can be easily managed and mitigated.

In the operation phase, impacts might occur due to the improper disposal of waste, especially fly and bottom ash, or uncontrolled discharges of wastewater. These issues can be easily managed.

5.3 Impacts on Water Resources

The Project will not discharge anything to waterbodies. Water will be supplied from the city network and the wastewater will be discharged into the city's sewer system. Chemicals, hazardous materials and waste will be managed in accordance with management plans. Therefore, no impacts on water resources are anticipated.

5.4 Impacts on Biodiversity and Ecology

The construction activities of the Project are being carried out in an area that has already lost its natural structure. There is no natural vegetation cover and therefore, no habitat loss occur. Ongoing measures to protect biodiversity and ecology includes fencing of construction sites and access roads and installation of OHTL above existing vegetation to avoid land clearing.

In the operation phase, there is the potential for adverse impacts on birds due to impacts with the stack. To mitigate these risks, the stack will be made more visible to birds by selecting an appropriate colour and installing lighting.

5.5 Noise Impacts

Construction activities are being carried out in a relatively remote area. It was anticipated that local community would not be affected significantly by increased levels of noise, and no noise complaints have been reported to date.

The main sources of noise during the operation phase will be turbines, cooling towers and other auxillary facilities. The EIA report included an acoustic modeling study that showed that legislative limit values would be met at sensitive receptors. No vibration impact is anticipated for operation phase.

As stated above, it is recommended by the Consultant that a new noise survey is undertaken to update the baseline data given in the 2012 EIA Report.

5.6 Waste

During the construction phase, construction wastes including excavated soil, packaging, wood, medical and domestic wastes will be generated.

In the operation phase of the Project, wastes such as domestic waste, hazardous waste, medical waste, excavation/demolition/construction waste, packaging waste, recyclable waste, fly and bottom ash etc. will be generated.

All waste-related impacts of the Project can be easily managed by implementing proper waste management approaches defined in a Waste Management Plan. Therefore, waste impacts will be low in significance.

5.7 Social Impacts

The Project will have positive impacts on local and national economy through creation of business opportunities for locals and reducing foreign dependency on energy.

Especially in the construction phase, the increase in the population of resident and non-resident workers on site and at the worker camp has the potential to put pressure on the social and community services and infrastructure. This will be managed by giving the priority to the locals in the recruitment process and applying a code of conduct to manage public-worker relations.

There is the potential for adverse impacts on local traffic both in the construction and operation phase of the Project. These impacts will be managed by Traffic Management Plans of the EPC Contractor, IMM and ISTAC.

5.8 Impacts on Health and Safety

Occupational health and safety risks will be managed by implementing management plans that are developed in line with international requirements amd standards, both in the construction and operation phases of the Project.

5.9 Impacts on Community Health and Safety

Impacts related to traffic will be managed as stated aboveProject Area.

The presence of large number of workers in the construction phase has the potential to give rise to increased spread of diseases. This might lead to increased pressure on health infrastructure.

Vegetation growth underlying the OHTL routes may give rise to a risk of forest fires. This will be managed by monitoring regular vegetation clearance and maintenance requirements of OHTL route and communicate with related authority when a clearance is needed.

5.10 Impacts on Archeological and Cultural Heritage

For all construction works that include earthworks, it is possible to discover an unknown artefact or an archeological site. In order not to lose or destroy such a find, a chance finds procedure will be implemented.

5.11 Cumulative Impacts

Cumulative impacts of the Project were assessed as part of the ESDD for this Project. The potential cumulative impact of the various infrastructure projects taking place in the area is of medium to high significance. The greatest potential impact was determined as pressure on forest areas. In addition, it was determined that many quarries that individually have limited impacts on air quality may have a cumulative effect in relation to dust, traffic and noise. Each project will need to

implement mitigation measures in order to reduce the contribution of each activity to the total impact.

6 Stakeholder Engagement

If effective and transparent relations with stakeholders are not established, social impacts may not be managed appropriately. Appropriate stakeholder engagement and information disclosure will be implemented for the Project. This will include the following measures:

- A Stakeholder Engagement Plan and a grievance mechanism have been prepared as part of this ESDD assignment. IMM and all contractors and subcontractors are expected to implement these.
- Good communication with the public, including local and regional communities is expected.
- Project related activities will be disclosed to the public.

7 Environmental and Social Management System

The Consultant recommends that a comprehensive Environmental and Social Management System (ESMS) is developed in order to mitigate risks and to align the Project with the IFC PSs and Good International Industry Practice. In order to achieve this, a set of actions has been collated in an ESAP, which is presented in Chapter 7 of the ESDD report. As defined in the ESAP, the following Project-specific documents should be prepared and/or updated to ensure compliance with national legislation and international standards:

- Environmental and Social Policy
- Labor and Employment Policy
- Environmental and Social Management Plan
- Emergency Preparedness and Response Plan
- Environmental and Social Monitoring Plan
- Human Resources Management Procudure
- Soil Management Plan
- Abnormal Operations Management Plan
- Air Quality and Emissions Management Plan
- Security Plan
- Chemicals and hazardous Materials Management Plan
- Noise and Vibration Management Plan
- Noise Control and Management Plan
- Waste Management Plan
- Traffic Management Plan
- Occupational Health and Safety Management Plan
- Community Health and Safety Management Plan
- Contractor Management Plan
- Hazardous Management Plan
- Employees Grievance Mechanism

In addition to IMM, it is expected that all Contractors and Sub Contractors will be responsible for the implementation of relevant parts of the ESMS. A Contractor Management Plan will be prepared and implementation of relevant management plans will be monitored by IMM.