MIDSEFF

European Bank
for Reconstruction and Development

Final Report

Mid-Size Sustainable Energy Financing Facility (MidSEFF)

Aktaş Solar PV Plant:
Non-Technical Summary (NTS)

June 2017

MWH
BUILDING A BETTER WORLD

D'APPOLONIA

GFA
Consulting Group

Frankfurt School of
Finance & Management
Bankakademie | HfB

Final Report

European Bank for Reconstruction and Development

Aktaş Solar PV Plant: Non-Technical Summary (NTS)

June 2017

The European Bank for Reconstruction and Development (EBRD) launched in January 2011 a financing facility aimed at scaling up Renewable Energy and Energy Efficiency investments in Turkey, to increase the country's energy savings and decrease its carbon emissions. The Turkish Mid-Size Sustainable Energy Financing Facility (MidSEFF) launched by the EBRD with support from the European Investment Bank (EIB) and the European Union (source of the Technical Cooperation funds) will provide a total of EUR 1,600 million (which includes EUR 400 million provided by EIB) in loans through 7 Turkish banks for on-lending to private sector borrowers.

This publication has been produced under the Mid-Size Sustainable Energy Financing Facility which received a financial assistance from the European Union. The content of this publication is the sole responsibility of the Consortium and can in no way be taken to reflect the views of the EU or the EBRD.

Project Name: Aktaş SEPP – Non-Technical Summary (NTS)				Controlled Copy	
Rev. N.	**Date**	**Description Amendment**	**Edited by**	**Revised by**	**Approved by**
00	June 2017	Final Report	B. Daylan	M. Compagnino	G.D. Sener

Table of Contents

Acronyms

dBA	decibel
EBRD	European Bank for Reconstruction and Development
ETL	Energy Transmission Line
IUCN	International Union for Conservation of Nature
SEPP	Solar Energy Power Plant
MidSEFF	Mid-Size Sustainable Energy Financing Facility
MoFAL	Ministry of Food, Agriculture and Livestock
NTS	Non-Technical Summary
PC	Project Consultant
PV	Photovoltaic
SPV	Special Purpose Vehicle
TEDAS	Turkish Electricity Distribution Company
The Sponsor	Aktaş Dış Ticaret Enerji A.Ş.

1. General Plant Description

Aktaş Solar PV Plant Project, with a total capacity of 15.25 MWe, aims to exploit the solar power potential within the borders of Erzurum Province in the Eastern Anatolia Region, Aydın, Muğla and İzmir Provinces in the Aegean Region and Adana Province in the Mediterranean Region of Turkey.

The Project consists of 21 unlicensed Solar PV plant sub-projects at 5 main locations as summarized below;

- 5 un-licensed PV projects in Aydın Province for a total of 2.5 MW;
- 6 un-licensed PV projects in Muğla Province for a total of 3.0 MW;
- 5 un-licensed PV projects in Adana Province for a total of 4.75 MW;
- 3 un-licensed PV projects in Erzurum Province for a total of 3 MW;
- 2 un-licensed PV projects in İzmir Province for a total of 2 MW.

The construction of the projects has been started in April 2017 and all projects will be completed at the end of December 2017.

Un-licensed PV plant whose capacity is smaller or equal to 1 MWe does not need to apply for an electricity production license. The Sponsor has received the call letters and the final connection agreements have been signed with the local DSOs (distribution system operator) for all sub-projects.

Aerial views of the proposed project sites are shown in the figures below.

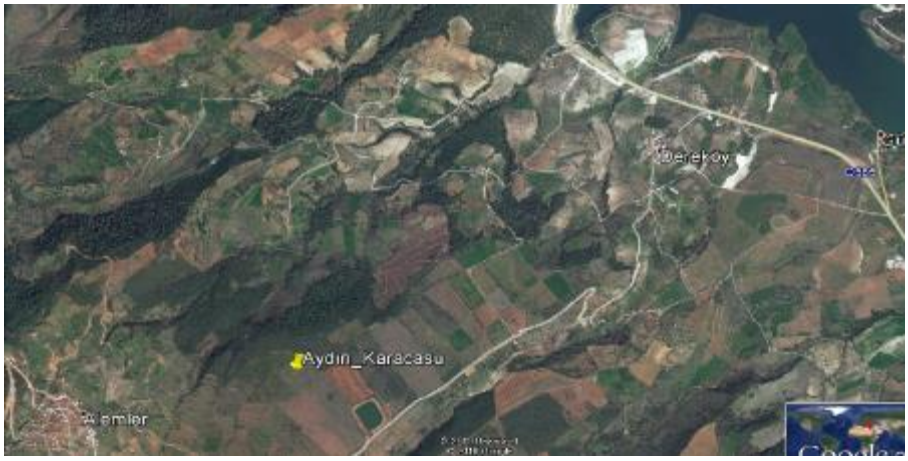

Figure 1-1: Aerial view of Aydın SEPP Projects

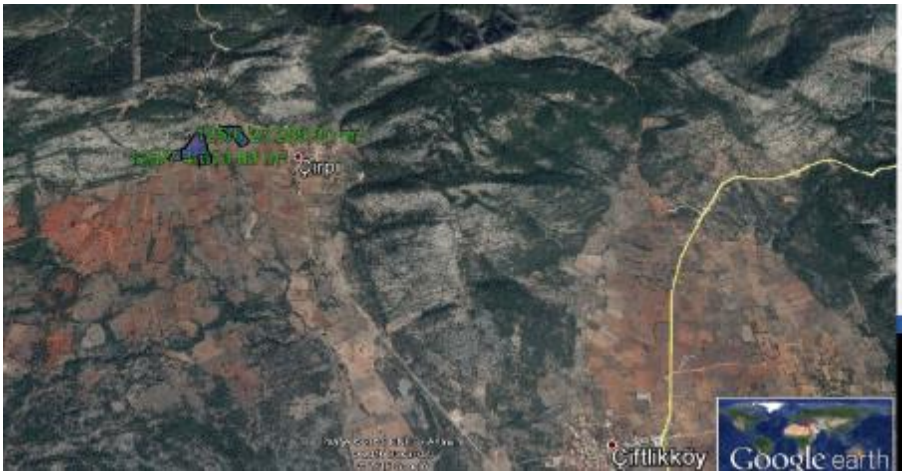

Figure 1-2: Aerial view of Muğla SEPP Projects

Figure 1-3: Aerial view of Adana SEPP Projects

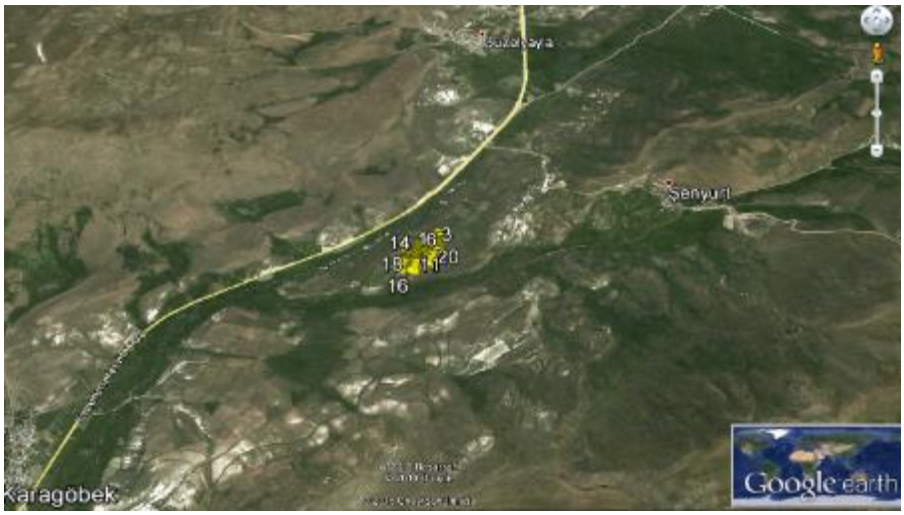

Figure 1-4: Aerial view of Erzurum SEPP Projects

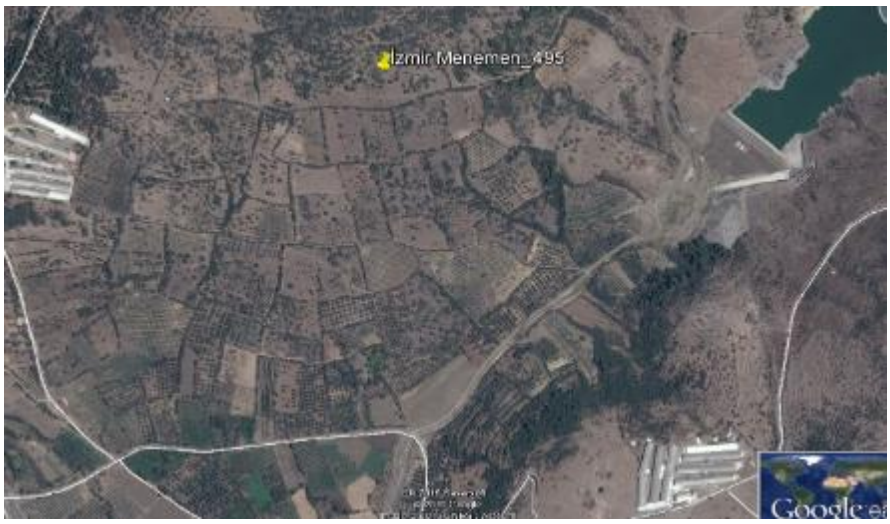

Figure 1-5: Aerial view of İzmir SEPP Projects

Table 1–1: Key project summary data

<table>
<tr><th colspan="2">Key Project Summary Data</th></tr>
<tr><td>Project Name</td><td>Aktaş SEPP</td></tr>
<tr><td>Project Borrower</td><td>7 Special Purpose Vehicles (SPVs) have been established under Turkish law for the specific purpose of developing, constructing and operating the unlicensed solar projects by Aktaş Enerji A.Ş. These SPVs (summarized below table) have been established by the Sponsor specifically to develop and realize the solar Photovoltaic sub-projects.
<table>
<tr><td>T Dinamik Enerji San. ve Dış Tic. A.Ş.</td><td>TDE Enerji Üretim San. ve Tic. A.Ş.</td></tr>
<tr><td>Ekogün Enerji Üretim San. ve Tic. A.Ş.</td><td>Kongres Enerji Üretim San. ve Tic. A.Ş.</td></tr>
<tr><td>Günko Enerji Üretim San. ve Tic. A.Ş.</td><td>Meramges Enerji Üretim San. ve Tic. A.Ş.</td></tr>
<tr><td>TD Yeşil Enerji Üretim San. ve Tic. A.Ş.</td><td></td></tr>
</table></td></tr>
<tr><td>Project Sponsor</td><td>Aktaş Dış Ticaret Enerji A.Ş.</td></tr>
<tr><td>EBRD Transaction</td><td>The total project cost is USD 18,182,315 including capitalized financing costs and Value Added Tax (VAT). The proposed financial scheme includes debt financing in the amount of USD 12,000,000 and the borrower’s own contribution in the amount of USD 6,182,315. The debt to equity ratio is approximately 66:34%. The investment will be completed in December 2017.</td></tr>
<tr><td>Project Description / Business Purpose</td><td>Aktaş SEPP project includes 21 unlicensed solar Photovoltaic (PV) sub-projects that will be realized under the legal status of 7 SPVs established to build and operate solar energy power plants.
Aktaş SEPP project will contribute to the share of renewable energy in the Turkish energy market.</td></tr>
<tr><td>Installed Capacity</td><td>15.25 MWe</td></tr>
<tr><td>Annual Electricity Production</td><td>25,750,000 kWh/year in first full year of production</td></tr>
</table>

2. Environmental and Social Baseline

2.1 Environmental description of the project areas

All sub-project locations are specified as 'marginal agricultural lands' or 'dry marginal agricultural lands' according to the official opinion letters received from the related Provincial Directorate of Food, Agriculture and Livestock. The Sponsor has also obtained "Non-Agricultural Utilization Permit" for the sub-projects in Aydın province in accordance with the Law no. 5403 on Soil Conservation and Land Use during the zoning plan approval process. The remaining sub-projects have also been requested to receive opinion letter from the local directorate of the MoFAL regarding "Non-Agricultural Utilization Permit" which should be obtained and shared with the PC.

The Sponsor has obtained the 'Environmental Impact Assessment (EIA) Exemption Letter' for all sub-projects.

According to the web-based research conducted on the official website of the Ministry of Forestry and Water Affairs (MoFWA) and the site surveys conducted for the proposed projects in Aydın and Muğla;

- The closest water surface is Karacasu Dam Lake which is about 3 km away from Aydın project site. There is also a small irrigation pond that is located about 260 m far from the site.
- The nearest Natural Park is Cetibeli Natural Park which is around 27 km away from Muğla project location. The closest protected area is Nenehatun National Park which is around 22 km far from Erzurum project site.
- For the sub-projects in Adana, Dağlıcak Natural Park is the closest protected area with about 28 km distance.
- For the sub-projects in İzmir, Yamanlardağı, Karagöl and Örnekköy are the Natural Parks located around the project location with distances of about 9-15 km. The closest water surface is Menemen Emiralem Dam Lake which is about 800 m away from the site.

According to these information, the proposed project sites have no direct interaction with any Natural Parks or Wildlife Protection Areas.

Since it is required by the related authority, an Ecological & Ornithological Assessment Report has been prepared for Aydın project site. According to the study, no protected, critical, rare or endangered species are found in and around the project area. Besides that, none of the fauna species (mammal, bird, reptile and amphibian species) found in and around the project site is endangered. Based on the Ecological Evaluation Report, it is concluded that there will be no adverse effect on the fauna species since there are alternative sites for sustaining the existence of local habitat. The main precautions suggested in the report are;

- The distance between the PV panels should be enough in terms of bird safety,
- A monitoring campaign during construction and operation is required to observe the effect of the SEPP on bird species,
- The top soil and the excavation material should be reused in the project site.
- All the project workers should be trained regarding the importance of natural structure and wildlife of the site.

For the subprojects located in Aydın province, monitoring on biota (bird species in particular) during construction and operation phases is required as it has been required by the related authority.

No fauna & flora study has been conducted for the other project locations. Based on the aerial/satellite images and desk based research performed by the PC, it can be said that project locations are not sensitive in terms of biodiversity in Erzurum and Adana locations.

For Muğla sub-project location; there are forestry lands next to the project location and tree cutting (mostly scrubs) has been performed. For İzmir sub-project locations, since Menemen Dam Lake is in a close proximity to İzmir sub-project location (800 m away from the project site), a desk-based fauna & flora study is required to be prepared for Muğla and İzmir project locations prior to the construction works.

The cadastral roads are available to reach Muğla and Aydın project sites. The Sponsor informed that construction of new roads are not planned and, noted that some parts of the existing cadastral roads can be improved/modified without any extension. The land status of this modified road is registered as cadastral road according to the information obtained from the Sponsor. Muğla project locations are located just beside the cadastral road of Çırpı Village. There is no information related to the total length of the roads that will be improved/modified for sub-projects located in İzmir, Adana and Erzurum provinces.

All project areas are already rented and/or owned by the Sponsor. The Sponsor will undertake no land acquisition, and there will be no involuntary resettlement nor economic displacement as part of this project. Regarding the lands to be used for the construction of ETLs, the PC suggests that the Sponsor should proceed with mutual agreements with the landowners, as far as possible.

Environmental characteristics of the project locations are summarized in Table 2-1.

Table 2–1: Environmental characteristics

ENVIRONMENTAL ASPECTS	PRESENCE /DISTRIBUTION	COMMENTS
Land use	All the project sites consist of “marginal” and “dry marginal” agricultural lands.	‘‘Dry marginal agricultural land decision letters have been obtained for all subproject locations. The Sponsor has also obtained “Non-Agricultural Utilization Permit” for the sub-projects in Aydın province. The remaining sub-projects have also been requested to receive opinion letter from the local directorate of the MoFAL regarding “Non-Agricultural Utilization Permit”.
Water surfaces	For Aydın subproject location, the closest water surface to the project sites is Karacasu Dam Lake which is about 3 km away from the site. For İzmir subproject location, Menemen Emiralem Dam Lake is about 800 m away from the site.	A desk based fauna & flora study is requested for İzmir project location prior to the construction works. Monitoring on biota (bird species in particular) during construction and operation phases is required for Aydın project location.
Protected areas	There are national parks with different distances (between 9 and 28 km) to the sub-project locations.There are no protected areas in the close vicinity of the subproject locations.	The proposed sub-projects sites have no interaction with any protected area. Any negative impacts from the Project on biodiversity in the surroundings of the project sites can be minimized through the implementation of the Environmental Management Plan.
Flora and Fauna	Since it is required by the related authority, an Ecological & Ornithological Assessment Report	A desk-based fauna & flora study must be prepared for İzmir and Muğla project locations prior to the

	has been prepared for Aydın project site. No fauna & flora study has been conducted for the other project locations. Based on the aerial/satellite images and desk based research performed by the PC, it can be said that project locations are not sensitive in terms of biodiversity in Erzurum and Adana locations. For Muğla sub-project location; there are forestry lands next to the project location and tree cutting (mostly scrubs) has been performed. For İzmir sub-project locations, Menemen Dam Lake is in a close proximity to İzmir sub-project location (800 m away from the project site).	construction works. Based on the reports, the mitigation measures must be implemented by the sponsor, if any. For the subprojects located in Aydın province, monitoring on biota (bird species in particular) during construction and operation phases is required. The mitigation measures defined in the Ecological Assessment Report must be implemented and considered in the EMP. Restoration and/or compensation measures must also be considered, if necessary.

2.2 Social condition of the project areas

The main sectors in Aydın Province are agriculture and tourism. 55% of the total population make their living from agricultural sector. The main products of the region are fig, chestnut, olive and cotton.

In Muğla Province, agricultural activities (cereals, citrus fruits and cotton) and tourism are the main sectors.

In Adana Province, industrial production is the major economic activity with the main sectors of cement, food, textile, agricultural machinery etc. Besides that, 39% of total area are used for agricultural activities.

Erzurum Province is a crucial player in stock farming (sheep, cattle and apiculture) and agriculture (especially cereals).

The three dominant sectors of İzmir Province are industrial activities (including production and trade), agriculture and tourism. 15% of the gross revenue comes from agriculture, 15% from trade and 35% from industry.

There is no privately owned area or any settlement currently exists in the project area. The closest residential areas to the sub-project sites are given in Table 2-2:

Table 2–2: The Closest Settlements to the Project Locations

Project Location	Closest Settlement	Approximate Distance (km)
Aydın	Alemler Village	0.8
	Dereköy Village	2.2
Muğla	Çırpı Village	0.6
	Çiftliköy Village	3.4
İzmir	Görece Village	1.2
Erzurum	Şenyurt Village	2.2
Adana	Ağzıkaraca Village	0.8

According to the official letters received from the Provincial Directorates of Culture and Tourism, there are no archeologically significant or cultural heritage sights available in the close proximity of the

proposed projects sites.

There are no indigenous peoples or ethnic minority groups in and around the project areas.

3. Social and Environmental Impacts

3.1 Land Use

All the proposed sub-project sites are located within dry marginal or marginal agricultural lands. The lands are already owned or rented by the Sponsor. The total area of the 21 sub-projects is 345,145 m^2.

Within the scope of the Project,

- 980 m ETL (960 m overhead and 20 m underground) for Aydın projects;
- The transformer station is adjacent to site according to the PS statement for Muğla projects;
- 4,605 m ETL (4,455 m overhead and 150 m underground) for Adana projects;
- 793 m ETL (758 m overhead and 35 m underground) for Erzurum projects;
- 1,600 m overhead ETL in total for İzmir project.

are planned. No EIA Decision will be required for the ETLs to be constructed within the scope of the project.

There is no settlement on the sub-project areas. There will be no involuntary resettlement nor economic displacement as part of this project.

3.2 Wastewater

There will be domestic facilities in the sub-project sites. The Sponsor informed that impermeable septic tanks will be constructed at each project locations in compliance with related Turkish regulations for the temporary storage of the domestic wastewater produced.

Based on the assumption that the daily domestic water requirement is 150 liters per person and the number of workers to be employed at each project locations will be 20 during the construction phase and 1 during the operations phase, the produced domestic wastewater amount in the construction and operation phases of the project are estimated to be 3 m^3/day and 0.15 m^3/day, respectively.

According to the above information, the Project will not cause degradation in environmental quality in terms of the water component.

3.3 Waste Production and Management

It is estimated that excavated materials/waste and domestic solid waste will be produced as a result of the construction activities. According to the Sponsor's statement, the excavated waste generated during the land preparation works will be reused within the project.

The domestic solid waste will be produced by the workers on-site. Assuming a daily domestic solid waste production rate of about 1.08 kg per person, it is estimated that 21.6 kg/day of domestic solid waste will be produced by 20 workers to be employed during the construction phase at each project location and 1.08 kg/day of waste will be produced by 1 workers to be employed during the operation phase at each project location.

Recyclable waste should be collected in separate waste containers and potentially hazardous waste should be segregated from non-hazardous construction waste and domestic solid waste. The PC recommends the Sponsor to prepare a waste management plan and to implement it accordingly during the construction and operation phases. Separate temporary storage areas that have impermeable base should be provided for the storage of waste oils, fuels, hazardous substances, etc.

3.4 Emissions: Noise and Particulate

Noise emissions will be generated during the construction phase mainly due to the earthmoving and excavation works and installation of the PV mounting structures.

No study has been conducted for the assessment of the noise levels at the sensitive receptors for all project locations. It is expected that the project-related noise level at the nearest settlements will be

below the noise limit value of 70 dBA defined by the related national regulation, namely Regulation on Assessment and Management of Environmental Noise considering the distance between the closest settlements and the project locations (>0.5 km). Adequate measurements will also be carried out in case of grievance in the construction phase.

Dust formation from earthworks and exhaust gas emissions from the construction machinery will be the sources of impacts on air quality during the construction phase. However, considering the scope of the works, the impact on air quality will be low and temporary and, for this reason, a modelling study is not required. However, the Sponsor must take necessary measures during transportation and earth works to minimize the dust/pollutant emissions considering the distance between the residential areas and the proposed project sites. In the construction phase, adequate measurements must also be carried out in case of grievance.

No air or noise emission generation is expected for the operation phase. As a result, the effect of the Project on noise and air emission levels at the surrounding settlements will be negligible.

3.5 Landscape

Since the PV power plants require large areas (15,000-20,000 m^2/MW capacity) for solar radiation collection, land degradation during the construction landscape could be a sensitive aspect for this kind of project. Although there is no national regulatory requirement, the PC suggests an assessment of visual impacts on the sensitive receptors (the closest settlements or roads) with a photo montage study for all project locations. The studies should be presented to the public in the public disclosure meetings.

The Sponsor informed that reflection caused by the panels will be negligible due to the anti-reflective coatings on solar PV panels. Considering the location and distance of potential receptors of the proposed project sites, no adverse impact is expected regarding this matter, hence a glint and glare study is considered not necessary for the proposed projects.

Based on the Ecological Evaluation Report conducted for the project site located in Aydın province, it is not expected any adverse effect on landscape. According to the PS statement and as well as the investigation of the aerial/satellite images, there will be no significant tree cutting for proposed project sites in Erzurum, Adana and İzmir provinces. In Aydın and Muğla project sites, tree cutting (mostly scrubs) has been performed.

Earthmoving will be required at some project locations within the scope of land preparation works. As regards topsoil management, the Sponsor is subject to prepare “Soil Protection Report” if it is required by the related authority during the “Non-Agricultural Utilization permit” process, in order to minimize soil damage and to provide optimal conditions for site restoration. The Sponsor has to comply with the requirements of these reports during the construction and operation phases of the project according to the Law No. 5403 on Soil Conservation and Land Use (if it is required). Any negative impacts regarding the soil protection from the Projects must be minimized through the implementation of the Environmental Management Plan. Based on the plan, the mitigation measures must be implemented by the Sponsor.

3.6 Summary of Environmental and Social Impacts

A summary of the impacts with their quantifications is given in Table 3-1.

Table 3–1: Impact Quantification

COMPONENT	IMPACT	QUANTIFICATION
Land use	Use of agricultural land	Dry marginal and marginal agricultural lands with a total 345,145 m^2 area will be used for the 21 sub-projects. The Sponsor has also obtained “Non-Agricultural Utilization Permit” for the sub-projects in Aydın province. The remaining sub-projects have also been requested to receive opinion letter from

		the local directorate of the MoFAL regarding "Non-Agricultural Utilization Permit". All project areas are rented and/or owned by the sponsor.
Wastewater	Utilization and Discharge	The domestic waste water productions are estimated to be 3 m^3/day during the construction phase and 0.15 m^3/day during the operation phase (assuming 20 workers during construction and 1 workers during operation)
Waste	Production of solid waste	The domestic solid waste productions are estimated to be 21.6 kg/day in the construction phase and 1.08 kg/day in the operation phase (assuming 20 workers during construction and 1 worker during operation)
	Excavation waste	The majority of excavated waste generated during the land preparation works will be used as backfill material.
Fauna and flora	Interference with flora-fauna species	A desk based fauna & flora study is requested for Aydın and İzmir project locations prior to the construction works. Based on the reports, the mitigation measures must be implemented by the sponsor, if any. Monitoring on biota (bird species in particular) during construction and operation phases is required for Aydın project location. The mitigation measures defined in the Ecological Assessment Report should be implemented and considered in the EMP. Restoration and/or compensation measures must also be considered, if necessary. The proposed sub-project sites have no interaction with any Natural Parks or Wildlife Protection Areas.
Emissions	Noise	Construction phase < local reg. limit of 70 dBA Operational phase < local reg. limit of 65 dBA
	Particulate	Construction phase < local reg. limit = 1 kg/h No particulate emission during the operation phase
Landscape	Changes in the aspect of the area	A visual impact assessment and the photo-impact simulations from significant or sensitive viewpoints have been required for all sub-project sites.

MidSEFF Office
Salih Omurtak Cad., No. 61
Kosuyolu
34718 Kadikoy, Istanbul
TURKEY
www.midseff.com