



Final Report

Mid Size Sustainable Energy Financing Facility (MidSEFF) Met-gün Solar Energy Power Plant: Non-Technical Summary (NTS)

October 2017

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Acronyms

AKEDAŞ	Akdeniz Electricity Distribution Company
BERN	Bern Convention
CIA	Cumulative Impact Assessment
CITES	The Convention on International Trade in Endangered Species of Wild Fauna and Flora
EBRD	European Bank of Reconstruction and Development
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EPC	Engineering, Procurement and Construction
ERP	Emergency Response Plan
ESAP	Environmental and Social Action Plan
ETL	Energy Transmission Line
EU	European Union
ESGA	Environmental and Social Gap Analysis Report
GDZ	Gediz Electricity Distribution Company
GIS	Geographical Information System
ha	Hectare
HS	Health and Safety
IUCN	The International Union for Conservation of Nature
kWe	Kilowatt electrical
kWp	Kilowatt Peak
LC	Least Concern
MidSEFF	Mid-Size Sustainable Energy Financing Facility
MoEU	Ministry of Environment and Urbanization
MoFWA	Ministry of Forestry and Water Affairs
MWe	Megawatt electrical
OHS	Occupational Health and Safety
PC	Project Consultant
PIR	Project Information Report
PR	Performance Requirements
PV	Photovoltaic
SACs	Special Areas for Conservation
SEP	Stakeholder Engagement Plan
SEPP	Solar Energy Power Plant
SPAs	Special Protection Areas
SPV	Special Purpose Vehicle
TEDAŞ	Turkish Electricity Distribution Corporation
TSI	Turkish Statistical Institute
VIP	Visual Impact Assessment
VU	Vulnerable
WLDP	Wildlife Development Area
Wp	Watt Peak

1. General Plant Description

The Met-gün SEPP Project is composed of 54 different unlicensed solar projects that will be realized under the legal status of 22 SPVs (Special Purpose Vehicle) established to build and operate solar energy power plants located in the Kahramanmaraş and İzmir Provinces. The sponsor of the project is Met-gün A.Ş.

The overall project (Met-gün SEPP) with 48.946 (43.956 + 4.990) MWe total installed capacity of Solar Photovoltaic (PV) Power Plants consists of 54 solar PV sub-projects as detailed below;

- 44 x 0.999 MWe (43.956 MWe capacity, un-licensed PV sub-projects, separated into 3 areas in the Gökçek Neighbourhood, Elbistan District, Kahramanmaraş Province.
- 5 x 0.498 MWe + 5 x 0.500 MWe (4.990 MWe capacity, un-licensed PV sub-projects) in the Derebaşı Neighbourhood, Tire District, İzmir Province.

The closest settlement to the SEPPs in Kahramanmaraş is the Kökez settlement in the Gökçek Neighbourhood. Kökez is 600 m away from the project area. Access to the site is possible through an existing road. There is no need for the construction of new access road for these SEPPs.

The closest settlements to the SEPPs in İzmir are the Derebaşı and Doyranlı Neighbourhoods, which are both 1.5 km away from the project area. The closest residential building is located at 250 m southeast of the project area. Access to the site is possible through an existing road. There is no need for the construction of new access road for these SEPPs.

There need to be Energy Transmission Lines (ETLs) for both projects to ensure the connection from the SEPP to the nearest grid connection point.

The estimated length of the ETL for the SEPPs in Kahramanmaraş is about 27 km and it is a 31.5 kV overhead line. The connection point will be Çoğulhan Tevzi Substation Center. The connection agreements have been signed with the relevant Distribution System Operator (Akdeniz Electricity Distribution Company (AKEDAŞ) on 02.03.2017. Design studies for ETL routes are continuing and any required applications will be submitted to TEDAŞ in case of any change.

The estimated length of the ETL of the SEPPs in İzmir is 721 m and it is a 34.5 kV overhead line. The ETL will be connected to the existing Kayacık ETL. There are connection agreements signed with Gediz Electricity Distribution Company (GDZ) on 17.07.2017 and 03.08.2017.

Project location of each sub project are given in below figures.

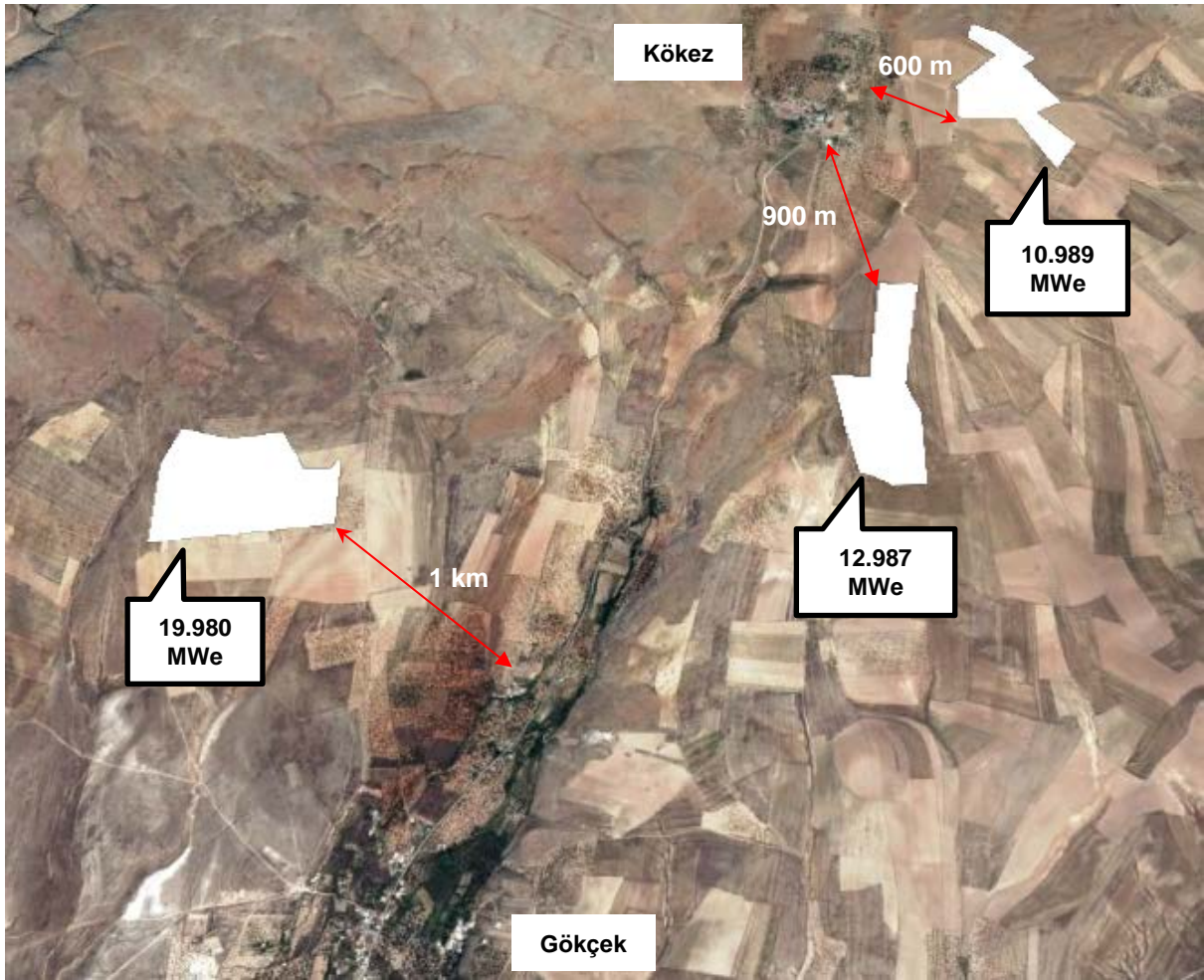


Figure 1-1: Project Locations of the SEPPs in Kahramanmaraş



Figure 1-2: Project Location of the SEPPs in İzmir

A table with the summary of each project is presented below.

Table 1-1: Met-gün SEPP Project Detail Information

	#	Project Name	SPV Name	Parcel	EIA Decision	Date of EIA Decision	Capacity (kWe)	Call Letter Date	TEDAŞ Approval Date	Connection Agreement Date
Location 1: Kahramanmaraş	1	A1 Malternatif SEPP	Malternatif Enerji Üretim A.Ş.	115/33	EIA Exemption	21.11.2014	999	15.01.2016	30.12.2016	02.03.2017
	2	A2 Ottoman SEPP	Ottoman Enerji Üretim A.Ş.	115/33	EIA Exemption	05.11.2014	999	15.01.2016	30.12.2016	02.03.2017
	3	A3 Mne SEPP	Mne Enerji Üretim A.Ş.	115/33	EIA Exemption	04.11.2014	999	15.01.2016	30.12.2016	02.03.2017
	4	B1 Koordinat SEPP	Koordinat Enerji Üretim A.Ş.	116/3	EIA Exemption	04.11.2014	999	15.01.2016	30.12.2016	02.03.2017
	5	B2 Matris SEPP	Matris Enerji Üretim A.Ş.	116/3	EIA Exemption	12.11.2014	999	15.01.2016	30.12.2016	02.03.2017
	6	B3 Hipotez SEPP	Hipotez Enerji Üretim A.Ş.	116/3	EIA Exemption	12.11.2014	999	15.01.2016	30.12.2016	02.03.2017
	7	B4 Referans SEPP	Referans Enerji Üretim A.Ş.	116/3-18-19	EIA Exemption	24.11.2014	999	15.01.2016	30.12.2016	02.03.2017
	8	B5 Teğet SEPP	Teğet Enerji Üretim A.Ş.	116/18-19	EIA Exemption	04.11.2014	999	15.01.2016	30.12.2016	02.03.2017
	9	B6 Medyan SEPP	Medyan Enerji Üretim A.Ş.	116/18-19	EIA Exemption	05.11.2014	999	15.01.2016	30.12.2016	02.03.2017
	10	B7 Oran SEPP	Oran Enerji Üretim A.Ş.	116/18	EIA Exemption	04.11.2014	999	15.01.2016	30.12.2016	02.03.2017
	11	B8 Grafik SEPP	Grafik Enerji Üretim A.Ş.	116/18-19	EIA Exemption	04.11.2014	999	15.01.2016	30.12.2016	02.03.2017
	12	B9 Mne SEPP	Mne Enerji Üretim A.Ş.	116/19	EIA Exemption	05.11.2014	999	15.01.2016	30.12.2016	02.03.2017
	13	B10 Çokgen SEPP	Çokgen Enerji Üretim A.Ş.	116/19	EIA Exemption	12.11.2014	999	15.01.2016	30.12.2016	02.03.2017
	14	B11 Afşin SEPP	Afşin Enerji Üretim A.Ş.	116/18-19	EIA Exemption	21.11.2014	999	15.01.2016	30.12.2016	02.03.2017

	#	Project Name	SPV Name	Parcel	EIA Decision	Date of EIA Decision	Capacity (kWe)	Call Letter Date	TEDAŞ Approval Date	Connection Agreement Date
	15	B12 MTemiz SEPP	MTemiz Enerji Üretim A.Ş.	116/18	EIA Exemption	04.11.2014	999	15.01.2016	30.12.2016	02.03.2017
Location 1: Kahramanmaraş	16	B13 Oran SEPP	Oran Enerji Üretim A.Ş.	116/18-19	EIA Exemption	05.11.2014	999	15.01.2016	30.12.2016	02.03.2017
	17	C1 Koordinat SEPP	Koordinat Enerji Üretim A.Ş.	136/15	EIA Exemption	05.11.2014	999	15.01.2016	30.12.2016	02.03.2017
	18	C2 Çokgen SEPP	Çokgen Enerji Üretim A.Ş.	136/15	EIA Exemption	13/11/2014	999	15.01.2016	30.12.2016	02.03.2017
	19	C3 Mne SEPP	Mne Enerji Üretim A.Ş.	136/15	EIA Exemption	05.11.2014	999	15.01.2016	30.12.2016	02.03.2017
	20	C4 Grafik SEPP	Grafik Enerji Üretim A.Ş.	136/15	EIA Exemption	05.11.2014	999	15.01.2016	30.12.2016	02.03.2017
	21	C5 Oran SEPP	Oran Enerji Üretim A.Ş.	136/15	EIA Exemption	05.11.2014	999	15.01.2016	30.12.2016	02.03.2017
	22	C6 Referans SEPP	Referans Enerji Üretim A.Ş.	136/15	EIA Exemption	04.11.2014	999	15.01.2016	30.12.2016	02.03.2017
	23	C7 Matris SEPP	Matris Enerji Üretim A.Ş.	136/15	EIA Exemption	12.11.2014	999	15.01.2016	30.12.2016	02.03.2017
	24	C8 Hipotez SEPP	Hipotez Enerji Üretim A.Ş.	136/15-16	EIA Exemption	12.11.2014	999	15.01.2016	30.12.2016	02.03.2017
	25	C9 Afşin SEPP	Afşin Enerji Üretim A.Ş.	136/15-16	EIA Exemption	17.11.2014	999	15.01.2016	30.12.2016	02.03.2017
	26	C10 MTemiz SEPP	MTemiz Enerji Üretim A.Ş.	136/15-16	EIA Exemption	05.11.2014	999	15.01.2016	30.12.2016	02.03.2017
	27	C11 Malfa SEPP	Malfa Enerji Üretim A.Ş.	136/15-16	EIA Exemption	12.11.2014	999	15.01.2016	30.12.2016	02.03.2017
	28	C12 Malternatif SEPP	Malternatif Enerji Üretim A.Ş.	136/15-16	EIA Exemption	05.11.2014	999	15.01.2016	30.12.2016	02.03.2017
	29	C13 MSolar SEPP	MSolar Enerji Üretim A.Ş.	136/15-16	EIA Exemption	12.11.2014	999	15.01.2016	30.12.2016	02.03.2017
30	C14 Medyan SEPP	Medyan Enerji Üretim A.Ş.	136/15-16	EIA Exemption	12.11.2014	999	15.01.2016	30.12.2016	02.03.2017	

	#	Project Name	SPV Name	Parcel	EIA Decision	Date of EIA Decision	Capacity (kWe)	Call Letter Date	TEDAŞ Approval Date	Connection Agreement Date	
Location 1: Kahramanmaraş	31	C15 Teğet SEPP	Teğet Enerji Üretim A.Ş.	136/16	EIA Exemption	12.11.2014	999	15.01.2016	30.12.2016	02.03.2017	
	32	C16 MGüneş SEPP	MGüneş Enerji Üretim A.Ş.	136/16	EIA Exemption	05.11.2014	999	15.01.2016	30.12.2016	02.03.2017	
	33	C17 Koordinat SEPP	Koordinat Enerji Üretim A.Ş.	136/16	EIA Exemption	05.11.2014	999	15.01.2016	30.12.2016	02.03.2017	
	34	C18 Matris SEPP	Matris Enerji Üretim A.Ş.	136/16	EIA Exemption	12.11.2014	999	15.01.2016	30.12.2016	02.03.2017	
	35	C19 Hipotez SEPP	Hipotez Enerji Üretim A.Ş.	136/16	EIA Exemption	19/11/2014	999	15.01.2016	30.12.2016	02.03.2017	
	36	C20 Grafik SEPP	Grafik Enerji Üretim A.Ş.	136/16	EIA Exemption	05.11.2014	999	15.01.2016	30.12.2016	02.03.2017	
	37	D1 MGüneş SEPP	MGüneş Enerji Üretim A.Ş.	110/50	EIA Exemption	05.11.2014	999	15.01.2016	30.12.2016	02.03.2017	
	38	D2 Solar SEPP	MSolar Enerji Üretim A.Ş.	110/49-50	EIA Exemption	12.11.2014	999	15.01.2016	30.12.2016	02.03.2017	
	39	D3 Malternatif SEPP	Malternatif Enerji Üretim A.Ş.	110/49-50	EIA Exemption	21/11/2014	999	15.01.2016	30.12.2016	02.03.2017	
	40	D4 Malfa SEPP	Malfa Enerji Üretim A.Ş.	110/49	EIA Exemption	12.11.2014	999	15.01.2016	30.12.2016	02.03.2017	
	41	D5 MTemiz SEPP	MTemiz Enerji Üretim A.Ş.	110/49	EIA Exemption	05.11.2014	999	15.01.2016	30.12.2016	02.03.2017	
	42	D6 Afşin SEPP	Afşin Enerji Üretim A.Ş.	110/49	EIA Exemption	12.11.2014	999	15.01.2016	30.12.2016	02.03.2017	
	43	D7 Çokgen SEPP	Çokgen Enerji Üretim A.Ş.	110/49	EIA Exemption	12.11.2014	999	15.01.2016	30.12.2016	02.03.2017	
	44	D8 Mne SEPP	Mne Enerji Üretim A.Ş.	110/49	EIA Exemption	17/11/2014	999	15.01.2016	30.12.2016	02.03.2017	
Sub-total							43.956 MWe				

	#	Project Name	SPV Name	Parcel	EIA Decision	Date of EIA Decision	Capacity (kWe)	Call Letter Date	TEDAŞ Approval Date	Connection Agreement Date	
Location 2: Izmir	45	Günsonu - 0.5 MW SEPP	Günsonu Enerji Üretim Danışmanlık San. ve Tic. A.Ş.	2108	EIA Exemption	18.08.2015	500	14.12.2015	01.08.2016	03.08.2017	
	46	Günsonu - 0.498 MW SEPP	Günsonu Enerji Üretim Danışmanlık San. ve Tic. A.Ş.	2108	EIA Exemption		498	14.12.2015	29.07.2016	03.08.2017	
	47	Günsonu 7 - 0.498 MW SEPP	Günsonu 7 Enerji Üretim Danışmanlık San. ve Tic. A.Ş.	2104-2108	EIA Exemption	05.08.2015	498	14.12.2015	29.07.2016	03.08.2017	
	48	Günsonu 7 - 0.5 MW SEPP	Günsonu 7 Enerji Üretim Danışmanlık San. ve Tic. A.Ş.	2105-2108	EIA Exemption		500	14.12.2015	29.07.2016	03.08.2017	
	49	Günsonu 8 - 0.498 MW SEPP	Günsonu 8 Enerji Üretim Danışmanlık San. ve Tic. A.Ş.	2106	EIA Exemption	18.08.2015	498	14.12.2015	29.07.2016	03.08.2017	
	50	Günsonu 8 - 0.5 MW SEPP	Günsonu 8 Enerji Üretim Danışmanlık San. ve Tic. A.Ş.	2107	EIA Exemption		500	14.12.2015	29.07.2016	03.08.2017	
	51	Günsonu 9 - 0.5 MW SEPP	Günsonu 9 Enerji Üretim Danışmanlık San. ve Tic. A.Ş.	2103	EIA Exemption		500	14.12.2015	01.08.2016	03.08.2017	
	52	Günsonu 9 - 0.498 MW SEPP	Günsonu 9 Enerji Üretim Danışmanlık San. ve Tic. A.Ş.	2103	EIA Exemption		498	14.12.2015	01.08.2016	03.08.2017	
	53	Günsonu 10 - 0.5 MW SEPP	Günsonu 10 Enerji Üretim Danışmanlık San. ve Tic. A.Ş.	2103	EIA Exemption		500	14.12.2015	29.07.2016	17.07.2017	
	54	Günsonu 10 - 0.498 MW SEPP	Günsonu 10 Enerji Üretim Danışmanlık San. ve Tic. A.Ş.	2103	EIA Exemption		498	14.12.2015	01.08.2016	17.07.2017	
Sub-total							4.990 MWe				
Total Installed capacity							48.946 MWe				

2. Environmental and Social Baseline

2.1 Environmental Description of the Project Area

The overall project (Met-gün SEPP) with 48.946 (43.956 + 4.990) MWe total installed capacity of Solar Photovoltaic (PV) Power Plants consist of 54 solar PV sub-projects as detailed below;

- 44 x 0.999 MWe (43.956 MWe capacity, un-licensed PV sub-projects, separated into 3 areas in the Gökçek Neighbourhood, Elbistan District, Kahramanmaraş Province.
- 5 x 0.498 MWe + 5 x 0.500 MWe (4.990 MWe capacity, un-licensed PV sub-projects) in the Derebaşı Neighbourhood, Tire District, İzmir Province.

The closest settlement to the SEPPs in Kahramanmaraş is the Kökez settlement in the Gökçek Neighbourhood. Kökez is 600 m away from the project area. Access to the site is possible through an existing road. There is no need for the construction of new access road for these SEPPs.

The closest settlements to the SEPPs in İzmir are the Derebaşı and Doyranlı Neighbourhoods, which are both 1.5 km away from the project area. The closest residential building is located at 250 m southeast of the project area. Access to the site is possible through an existing road.

The lands used for the SEPPs in Kahramanmaraş are owned by the Sponsor and rented out to the SPVs. The lands used for the SEPPs in İzmir are owned by the EPC Contractor of the SEPPs in İzmir and the lands are rented out to the SPVs.

The SEPPs in Kahramanmaraş will be carried out within the borders of private-registered land with a total area of about 64 hectares (ha) which was purchased by the Sponsor. According to the formal opinion letter obtained on 05.11.2014 from the Provincial Directorate of Food, Agricultural and Livestock, the Project site is classified as dry marginal agricultural area. The Sponsor has obtained a "Non-Agricultural Utilization Permit" on 04.08.2015 from the same authority for the sub-projects in Kahramanmaraş province in accordance with the Law no. 5403 on Soil Conservation and Land Use.

The estimated length of the ETL for the SEPPs in Kahramanmaraş is about 27 km and it is a 31.5 kV overhead line. The connection point will be Çoğulhan Tevzi Substation Center. There are connection agreements signed with Akdeniz Electricity Distribution Company (AKEDAŞ) on 02.03.2017.

The SEPPs in İzmir will be carried out within the borders of private-registered land with a total area of about 7.36 ha which was rented by the Sponsor. According to the formal opinion letter obtained on 05.11.2014 from the Provincial Directorate of Food, Agricultural and Livestock, the Project site is classified as dry marginal agricultural area. The Sponsor has obtained a "Non-Agricultural Utilization Permit" on 30.06.2016 from the same authority for the sub-projects in İzmir province in accordance with the Law no. 5403 on Soil Conservation and Land Use.

The estimated length of the ETL of the SEPPs in İzmir is 721 m and it is a 34.5 kV overhead line. The ETL will be connected to the existing Kayacık ETL. There are connection agreements signed with Gediz Electricity Distribution Company (GDZ) on 17.07.2017 and 03.08.2017.

According to the Geographical Information System (GIS) data of the Ministry of Forestry and Water Affairs (MoFWA), the closest protection area is the Hançerderesi Wildlife Development Area (WLDA) which is 90 km away from the SEPPs in Kahramanmaraş. There is an irrigation dam which is located at 2.5 km southeast of the project area.

Ovacık WLDA is the closest protection area which is 15 km away from the SEPPs in İzmir. The closest water source to the project area is the Küçükmenderes River which is located 1 km southeast of the project area in İzmir. According to the above mentioned GIS data of the MoFWA, the Küçükmenderes River does not have a legal protection status, the river is classified as a "wetland".

A summary of the environmental characteristics of the Project is given below.

Table 2-1: Summary of environmental characteristics

ENVIRONMENTAL ASPECTS	PRESENCE /DISTRIBUTION	COMMENTS
Land use	The project areas consist of agricultural lands.	The project areas have been classified as 'dry marginal agricultural land' by the Provincial Directorates of Food, Husbandry and Agriculture. The related authority has provided the permission relating the use of the lands for the establishment of the SEPP projects.
Water surfaces	The closest water surface is the Küçükmenderes River which is located 1 km southeast of the project area in İzmir.	There will not be any interaction with any water surface area during the project works.
Protected areas	Ovacık WLDA is the closest protection area which is 15 km away from the SEPPs in İzmir.	There will not be any interaction with any protected area during the project works.
Flora and Fauna	Since Environmental Impact Assessment (EIA) Exemption Decisions" have been obtained by the Sponsor for each sub-project from the related authority; any Project Information Report (PIR) or EIA Report has not been prepared and there is not any ecological assessment conducted for the project areas.	A desk based flora/fauna study must be prepared by the Sponsor for the project sites since there is no study available. Monitoring can be requested according to the results of the study.

2.2 Social Condition of the Project Areas

The population of the Elbistan District is 142,783 according to the 2016 data of the Turkish Statistical Institute (TSI). The population of the Elbistan District has increased between 2000 (128,267 people according to the 2000 TSI data) and 2017. The population of the nearest settlement (the Gökçek Neighbourhood) is 270 according to the 2012 data and has decreased since 1985 (713 people).

The main economic activities in the Elbistan District and the settlements close to the SEPPs are agriculture and animal husbandry. Main agricultural products are cereal and sugar beet. Afşin-Elbistan Thermal Power Plant and Elbistan Sugar Factory are the most important industrial facilities in the district. The thermal power plant is located 20 km west and the sugar factory is located 25 km south of the project area.

The population of the Tire District is 83,082 according to the 2016 data of the Turkish Statistical Institute (TSI). The population of the Tire District has increased between 78,658 (60,640 people according to the 2000 TSI data) and 2017. The population of the nearest settlement (the Derebaşı Neighbourhood) is 1,066 according to the 2012 data and has decreased since 1985 (1,372 people).

The main economic activities in the Tire District and the settlements close to the SEPPs are agriculture, animal husbandry, industry and trade. Main agricultural products in the district are olive, fig, walnut, chestnut, mulberry, wheat, barley, tobacco, cotton and different kinds of fruits and vegetables. Cannery factories, milk and milk product plants, agricultural machinery factories, olive oil production plants

The closest settlement to the SEPPs in Kahramanmaraş is the Kökez settlement in the Gökçek Neighbourhood. Kökez is 600 m away from the project area.

The closest settlements to the SEPPs in İzmir are the Derebaşı and Doyranlı Neighbourhoods, which are both 1.5 km away from the project area. The closest residential building is located at 250 m southeast of the project area.

According to the official letters of the Ministry of Culture and Tourism, there is no cultural heritage site in the project areas.

3. Social and Environmental Impacts

3.1 Land Use

The SEPPs in Kahramanmaraş will be carried out within the borders of private-registered land with a total area of about 64 hectares (ha) which was purchased by the Sponsor. According to the formal opinion letter obtained on 05.11.2014 from the Provincial Directorate of Food, Agricultural and Livestock, the Project site is classified as dry marginal agricultural area. The Sponsor has obtained a “Non-Agricultural Utilization Permit” on 04.08.2015 from the same authority for the sub-projects in Kahramanmaraş province.

The estimated length of the ETL for the SEPPs in Kahramanmaraş is about 27 km and it is a 31.5 kV overhead line. The land acquisition process of the ETL in Kahramanmaraş will be completed by the related authority. The connection point will be Çoğulhan Tevzi Substation Center. Design studies for ETL routes are continuing and any required applications will be submitted to TEDAŞ in case of any change.

The SEPPs in İzmir will be carried out within the borders of private-registered land with a total area of about 7.36 ha which was rented by the Sponsor. According to the formal opinion letter obtained on 05.11.2014 from the Provincial Directorate of Food, Agricultural and Livestock, the Project site is classified as dry marginal agricultural area. The Sponsor has obtained a “Non-Agricultural Utilization Permit” on 30.06.2016 from the same authority for the sub-projects in İzmir province.

The estimated length of the ETL of the SEPPs in İzmir is 721 m and it is a 34.5 kV overhead line. The ETL will be connected to the existing Kayacık ETL. Land acquisition process has been completed for the İzmir ETL.

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 Water Use & Wastewater Management

During the construction period of the project, approximately 100 people will be employed in total. During the construction, water will be used for dust suppression, construction and domestic purposes. Assuming that daily water consumption per person would be 150 litres, daily 15 m³ domestic water will be used during the construction period of the SEPPs in Kahramanmaraş and İzmir. Drinking water will be provided from suppliers (large and small bottled water) and water which will be used for construction activities will be supplied from the nearest settlements.

During the operation period of the project, approximately 8 people will be employed for two locations. 1.2 m³ domestic water will be used during operation. Similar to the construction phase, drinking water will be provided from suppliers (large and small bottled water).

Only wastewater generated during the project activities will be domestic wastewater. Domestic waste water produced during both construction and operation phases of the project will be collected in septic tanks. The septic tanks should be impermeable, possibly concrete, and emptied by vacuum trucks regularly. Any discharge of wastewater to the receiving environment will be prevented in all phase of the project.

The sponsor predicts that there will be no need to clean the solar panels since the project sites are rainy areas. In case the need for cleaning/washing arises, pure water will be purchased and brought to the sites via tanks. The panels will be cleaned by brushes and pure water in order to remove the dust. The wastewater will not include any chemical or hazardous material. Water discharge from the panels is likely to evaporate or be absorbed into the soil after falling from the panels.

3.3 Waste Production and Management

Main types of the wastes generated during the construction phase of the project are:

- Domestic Solid Wastes
- Packaging Waste
- Hazardous Wastes
- Waste Batteries and Accumulators
- Waste Oil
- Waste Tire

Main types of the wastes generated during the operation phase of the project are domestic solid waste and packaging waste.

A temporary site waste storage areas must be constructed in the project areas. The storage areas shall have impermeable ground to prevent a possible leakage. Different types of wastes must be stored separately in the waste storage area and a register of waste generation, storage and disposal must be kept during construction and facility operation.

The volume of domestic solid waste depends on the number of persons employed. Assuming that the amount of solid waste per person would be 1.14 kg/person/day, a total of approximately 114 kg/day (for 100 people) domestic solid waste will be generated during construction and 9.12 kg/day (for 8 people) will be generated during the operation phase of the Met-gün SEPP Project. Domestic wastes will be collected and disposed off by the municipalities. Other types of wastes will be collected and disposed by the licensed companies. A register of all wastes and their disposal must be kept.

All staff will be trained in order to comply with waste management requirements. This will be monitored.

3.4 Emissions: Noise and Particulate

The following measures will be taken to prevent noise impact during construction activities:

- Appropriate personal protective equipment and materials such as helmets, ear protectors or ear plugs will be provided to protect workers from noise.
- There will not be any construction activities and construction vehicles will not pass through settlement areas during the night time (between 23:00 to 07:00) in week days and weekends.
- The following control measures will be applied;
 - selection of equipment with lower sound levels;
 - installing suitable mufflers on engine exhausts and compressor components;
 - limiting the hours of operation for specific pieces of equipment or operations, especially mobile sources operating through community areas;
 - reducing project traffic routing through community areas wherever possible;
 - developing a mechanism to record and respond to complaints.
- In addition, regular maintenance will be carried out on all construction equipment to ensure that noise levels are kept to a minimum.

There is not any study for the assessment of the noise levels at the sensitive receptors for all project locations. It is expected that the noise level at the closest settlements will be below the noise limit value of 70 dBA as per national regulation (Regulation on Assessment and Management of Environmental Noise) as there is a considerable distance between the closest settlements and the project locations. Noise measurements must be carried out in case of any complaints during the construction phase. There will not be any activity which will cause noise generation during the operation phase.

Possible impacts on air quality can arise from the use of construction and earthmoving machinery and from trucks and cars. Impacts will be mainly air pollutants from combustion engines and dust generation/release.

Construction activities will affect air quality mainly through emissions of dust from excavation and storage of soil, transport of soil and vehicle traffic on unpaved roads. There will also be particulates from vehicle exhausts (mainly diesel engines) and from stationary sources such as power generators. Emissions of gaseous pollutants, particularly NO_x and SO₂, will be from vehicle and machinery exhausts and also from stationary sources (power generators).

The following mitigation measures are considered relevant during construction phase to mitigate dust and exhaust gas dispersion during construction activities;

- wetting and covering powdery materials transported on trucks (e.g. excavation spoil);
- reduce truck and vehicle speed;
- periodic wetting of the stockpiled material to maintain a humidity of about 5%;
- periodic wetting of the construction areas and site access roads;
- use of working machinery with low emissions (and good maintenance);
- vehicles will be maintained in good condition to ensure they are no louder than similar vehicles on the roadways;
- use of diesel with low sulphur content.

Considering the limited scope of the works, the impact on air quality will be low and temporary. For this reason, a modelling study is not considered to be necessary. There will not be air emissions during the operation phase.

3.5 Landscape

The local landscape is characterised by an open and relatively flat topography, with partial grass vegetation. The project areas are more elevated than the neighbouring settlements. The projects will change the current landscape with the placement of large areas of dark coloured flat solar panel arrays. During construction of the project, excavated materials will be used for filling and top soil will be spread to the project area in order to preserve current soil condition and landscape.

The Sponsor informed the project advisor that reflection caused by the PV panels will be insignificant due to the anti-reflective coatings on solar PV panels. Moreover, based on the aerial/satellite images, there is no sensitive receptor (airport, high road, etc.) in the close proximity of the project sites. Therefore, no significant adverse impact is expected regarding the glint and glare.

The visual impacts can be significant for solar projects since large land areas (15,000-20,000 m²/MW capacity) are required for solar panels. Although there is no national regulatory requirement, a Visual Impact Assessment must be prepared prior to the construction works for all projects' locations. Photo simulations will be made and these materials must be used during the first Stakeholder Engagement Meetings.

3.6 Summary of Environmental and Social Impacts

A summary of the impacts with their quantifications is given below.

Table 3-1: Impact Quantification

COMPONENT	IMPACT	QUANTIFICATION
Land use	<u>Use of agricultural land</u>	The Provincial Directorates of Food, Husbandry and Agriculture have provided the permission relating the use of the lands for the establishment of the SEPP projects.
Wastewater	<u>Utilization and Discharge</u>	15 m ³ /day domestic wastewater during the construction phase and 1.2 m ³ /day domestic wastewater during the operation phase (assuming 100 workers in the construction and 8 workers in the operation phase).

Waste	<u>Production of solid waste</u>	114 kg/day domestic waste during the construction phase and 9.12 kg/day domestic waste during the operation phase (assuming 100 workers in the construction and 8 workers in the operation phase)
	<u>Excavation waste</u>	The amount of excavated material will not be high due to limited excavation works, and most of the amount will be used on site for refilling.
Fauna and flora	<u>Interference with flora-fauna species</u>	There is not any ecological (flora-fauna) assessment conducted for the project areas. A desk based flora/fauna study must be prepared. Monitoring can be requested according to the results of the study.
Emissions	<u>Noise</u>	There is not any study for the assessment of the noise levels at the sensitive receptors for all project locations. It is expected that the noise level at the closest settlements will be below the noise limit value of 70 dBA as per national regulation as there is a considerable distance between the closest settlements and the project locations. In case of complaints from local people, appropriate investigative measures must be carried out and mitigation measures must be implemented.
	<u>Particulate</u>	There is not any study for the assessment of the dust levels for all project locations. Particulate matter emissions must be kept lower than the regulatory limit by the dust mitigation measures. In case of complaints from local people, appropriate investigative measures must be carried out and mitigation measures must be implemented
Landscape	<u>Changes in the aspect of the area</u>	The Visual Impact Assessment must be prepared for all project locations.

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