



Final Report

# Mid-Size Sustainable Energy Financing Facility (MidSEFF) Koyuncu Nevşehir Solar Power Plant: Non-Technical Summary (NTS)

February 2017

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European Bank for Reconstruction and Development

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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 European Commission (source of the Technical Cooperation funds) will provide a total of EUR 1,500 million (which includes EUR 300 million provided by EIB) in loans through 7 Turkish banks for on-lending to private sector borrowers.

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## Acronyms

dBA	decibel
EBRD	European Bank for Reconstruction and Development
ETL	Energy Transmission Line
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	Koyuncu Group

## 1. General Plant Description

Koyuncu Nevşehir SEPP project is a bundle of 10 unlicensed PV sub-projects with 9.415 MWp/8.15 MWe rated power capacity in total and located in Çardak Bayırı, Süzme and Mağara locations of Kaymakli Town in Nevşehir Province situated in the Anatolia Region of Turkey. Solar-PV projects will be installed on mostly open terrains and the site elevations are varying between 1,417 m. to 1,485 m. a.s.l. with an average of 1.442 m. a.s.l. The Google earth views of each sub project locations are shown in Figure 1-1 and Figure 1-2.

The project sites have mild continental climate with low precipitation and dry summers having an average temperature of around 10.7°C ranging from -3.8°C in January to 28.4°C in Nevşehir, according to long-term national database.

Project location are classified as “dry marginal agricultural land” by Nevşehir Provincial Directorate of Food, Agricultural and Livestock.

Application for an electricity production license is not required for the PV plants whose capacity are smaller than or equal to 1 MWe. However, after receiving the Call Letter from the local Grid Operator and completion of TEDAS project approval process, the connection agreement must be signed with the Grid Operator. TEDAŞ project approval processes have been completed for all sub-projects, however, official letters for the grid connection agreements have not been obtained yet for all sub-projects. This issue will be followed during the monitoring. The construction of the sub-projects will be started on February 2017 and completed in the end of September 2017.



**Figure 1-1: Google Earth View of the proposed sub-project sites in Çardak and Mağara Locations**



**Figure 1-2: Google Earth View of the proposed sub-project site Süzme Location**



**Table 1–1: Key project summary data**

Key Project Summary Data	
<b>Project Name</b>	Koyuncu Nevşehir SEPP
<b>Project Borrower</b>	Durlanik Enerji İnş. Taah. Tur. San ve Tic. Ltd. Şti. Tosun Enerji İnş. Taah. Tur. San ve Tic. Ltd. Şti. Fırsat Enerji İnş. Taah. Tur. San ve Tic. Ltd. Şti. Dede Enerji İnş. Taah. Tur. San ve Tic. Ltd. Şti. Tekke Enerji İnş. Taah. Tur. San ve Tic. Ltd. Şti.
<b>Project Sponsors</b>	KOYUNCU Group
<b>EBRD Transaction</b>	The total project cost for 10 Solar PVs is USD 16,508,182 including USD 11,690,590 fixed investment cost, VAT of USD 4,368,781, USD 58,918 commitment and arrangement fee, USD 228,603 investment period interest and USD 161,290 working capital requirement. The debt financing amount of the investment will be USD 9,426,932 under MidSEFF program. The debt to equity ratio is calculated as approximately 57:43%.
<b>Project Description / Business Purpose</b>	<p>Koyuncu Nevşehir Solar PV Power Plant Project is composed of 10 different unlicensed sub-projects that will be realized under the legal status of 5 SPVs (Special Purpose Vehicle) established to build and operate solar energy power plants located in Çardak Bayırı, Süzme and Mağara Locations of Kaymaklı District in Nevşehir Province. Each sub-project's installed capacity is under 1 MW.</p> <p>The investment (Koyuncu Nevşehir SEPP Projects) has a total 8.15 MWe installed capacity as it is also summarized below;</p> <ul style="list-style-type: none"> <li>• 6 un-licensed PV projects in Çardak Bayırı Location, Kaymaklı Town, Nevşehir Province for a total of 4.19 MWe</li> <li>• 3 un-licensed PV projects in Mağara Location, Kaymaklı Town, Nevşehir Province for a total of 2.97 MWe</li> <li>• 1 un-licensed PV projects in Süzme Location, Kaymaklı Town, Nevşehir Province for a total of 0.99 MWe</li> </ul> <p>The project will approximately generate 14.6 GWh/year electricity in the first year of operation.</p> <p>The Sponsor has received the Call Letters and, completed the TEDAS project approval process for all projects and connection agreement process are still ongoing for all sub-projects.</p> <p>Within the scope of the project, 8.36 km ETL for Tosun 1 SEPP and 4.02 km ETL for the remaining sub-projects will be constructed.</p>
<b>Installed Capacity</b>	8.15 MWe
<b>Annual Electricity Production</b>	14,586 MWh

## 2. Environmental and Social Baseline

### 2.1 Environmental description of the project areas

Koyuncu Nevşehir PV solar power plant is located in Çardak Bayırı, Süzme and Mağara locations of Kaymaklı Town in Nevşehir Province situated in the Anatolia Region of Turkey. . The solar PV plants will be constructed on arid lands which are classified as “dry marginal agricultural land” by Nevşehir Provincial Directorate of Food, Agricultural and Livestock.

The proposed sub-project sites have no interaction with any Natural Parks or Wildlife Protection Areas. There is no natural park or protected area in close proximity of the sub-project sites as well. The closest Natural Park to the sub-project sites is Göreme Historical Natural Park and it is 15 km far away from the sub-projects located in Kaymaklı Town.

**Table 2–1: Environmental characteristics**

ENVIRONMENTAL ASPECTS	PRESENCE /DISTRIBUTION	COMMENTS
Land use	The project areas consist of dry marginal agricultural lands.	The official letters indicating that the sites are “dry marginal agricultural land” have been obtained. Non-Agricultural Utilization Permit should be obtained from the Provincial Directorate of MoFAL.
Water surfaces	N.A	-
Protected area	The closest Natural Park to the sub-project sites is Göreme Historical Natural Park and it is 15 km far away from the sub-projects located in Kaymaklı Town.	The proposed sub-project sites have no interaction with any protected area.
Flora and Fauna	The project sites is mostly arid land with shrub vegetation and no tree cutting will be required.	-

### 2.2 Social condition of the project areas

According to the 2015 census, the total population of Nevşehir Province and Kaymaklı Town are 290.895 and 4,360, respectively.

The Project will be constructed within the borders of the private-registered land which are owned by the sponsor. The closest residential areas to the sub-project sites (based on the Google Earth) is Kaymaklı Town with a distance of 3 km.

There is no natural, protected and sensitive area within the project site.

## 3. Social and Environmental Impacts

### 3.1 Land Use

All the proposed sub-project areas are located within dry marginal agricultural lands and owned by the sponsor. The official letters indicating that the sites are “dry marginal agricultural land” have been obtained from the related authority for all sub-projects. Each sub-project has been requested to receive opinion letter from the local directorate of the MoFAL regarding “Non-Agricultural Utilization Permit”.

A distance of 12.38 km ETLs will be constructed through underground cabling within or adjacent to public roads, therefore, no land acquisition is expected for the planned ETLs.

### 3.2 Water

Based on the assumption that the daily domestic water requirement is 150 liters per person and considering the total worker number of 60 during the construction phase and 10 during the operation phase, the total amounts of domestic wastewater production in the construction and operation phases are estimated as 9 m<sup>3</sup>/day and 1.5 m<sup>3</sup>/day, respectively. Wastewater generated during the construction and operation phases will be collected in impermeable septic tanks to be constructed for each sub-project site in compliance with the related Turkish regulations.

### 3.3 Waste

It is estimated that mainly domestic solid waste and construction waste will be produced as a result of construction activities. All suitable excavated waste generated during land preparation works will be used for land smoothing activities and there will be no remaining amount of excavation waste.

Domestic solid waste will be produced by workers on-site. Assuming the daily domestic solid waste production rate of 1.08 kg per person, it is estimated that 64.8 kg/day of waste will be produced by 60 workers to be employed during the construction phase and 10.8 kg/day of waste will be produced by 10 worker to be employed during the operation phase.

Recyclable waste should be collected in separate waste containers and potentially hazardous waste should be segregated from non-hazardous construction waste and domestic 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 bases 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 construction phase due to earthmoving works, installation of PV panels (Pile Driven activity) and operation of construction machinery and other equipment. Since noise will be mainly generated by the construction machinery and equipment and considering that residential houses are not close to the projects areas (>1 km), the noise level at the closest residential areas are expected to be below the noise limit value (70 dBA) defined by the related national regulation, namely Regulation on Assessment and Management of Environmental Noise. During the operation phase, no noise emission is expected to be produced.

Potential impacts of the Koyuncu Nevşehir SEPP on air quality will occur basically during the construction phase of the projects due to exhaust gases of heavy machinery and land arrangement works, therefore, the impact will be very low. The air emissions are expected to be below the legal limit values and for this reason a modelling study is not necessary.



No air emission is expected during the operations. It can be easily said that no relevant critical aspects (both for construction and operation phase) are expected related to air emissions.

### 3.5 Landscape

Since the PV power plants require large areas for solar radiation collection, landscape is usually a sensitive aspect for these kind of projects. Therefore, visual impact assessment is also another aspect to be determined. Although, there is no national regulatory requirement, the PC requires an assessment of visual impacts with a photomontage study for all project locations. The study results should also be shared with the public during disclosure meetings with the stakeholders.

**Table 3–1: Impact Quantification**

COMPONENT	IMPACT	QUANTIFICATION
<b>Land use</b>	<u>Use of agricultural land</u>	“Dry marginal agricultural land decision letters have been obtained. Non-Agricultural Utilization Permit is requested from the local directorate of the MoFAL
<b>Wastewater</b>	<u>Utilization and Discharge</u>	9 m <sup>3</sup> /day during the construction phase 1.5 m <sup>3</sup> /day during the operation phase
<b>Waste</b>	<u>Production of solid waste</u>	64.8 kg/day in the construction phase and 10.8 kg/day in the operation phase (assuming 60 workers during construction and 10 workers during operation)
	<u>Excavation waste</u>	The majority of excavated waste generated during land preparation works will be used for land smoothing
<b>Fauna and flora</b>	<u>Interference with flora-fauna species</u>	The project sites is mostly arid land with shrub vegetation and no tree cutting will be required.
<b>Emissions</b>	<u>Noise</u>	Construction phase < local reg. limit of 70 dBA Operational phase < local reg. limit of 65 dBA
	<u>Particulate</u>	Construction phase < local reg. limit = 1 kg/h No particulate emission during the operation phase
<b>Landscape</b>	<u>Changing in the aspect of the area</u>	A visual impact assessment is requested for all sub-projects.

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